

Research Report on Road Safety Marking Sector

September 2026

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1 Economic Outlook

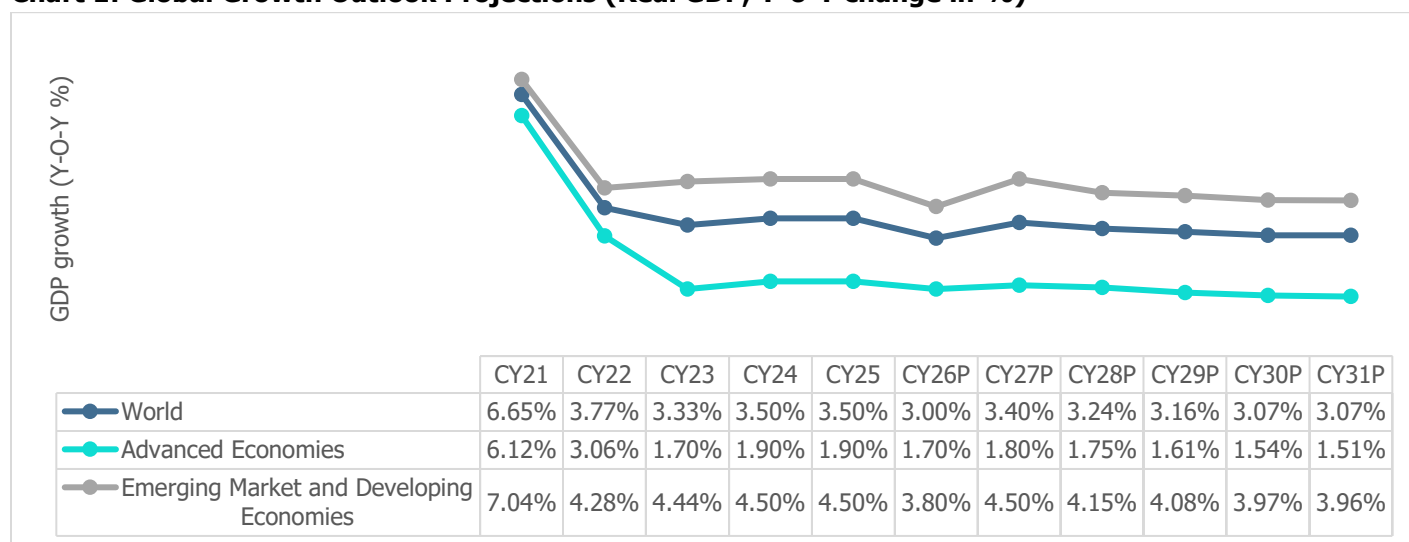
1.1 Global Economy

Global Economic Growth Expected to Sustain at ~3.07% in Near Term

Global economic growth is projected to moderate to around 3.00% in CY26, reflecting the impact of geopolitical tensions on energy and trade flows. The ongoing Middle East conflict poses downside risks, with prolonged disruptions potentially reducing growth further to 2.50%, or lower.

However, supportive factors such as continued investment momentum and policy support are helping offset some of these pressures.

Chart 1: Global Growth Outlook Projections (Real GDP, Y-o-Y change in %)



Source: IMF – World Economic Outlook, April 2026 and July 2026; Notes: P-Projection, E-Estimated

Table 1: GDP growth trend comparison - India v/s Other Economies (Real GDP, Y-o-Y change in %)

	Real GDP (Y-o-Y change in %)										
	CY21	CY22	CY23	CY24	CY25	CY26P	CY27P	CY28P	CY29P	CY30P	CY31P
India	9.69	7.61	7.21	7.10	7.70	6.40	6.70	6.50	6.52	6.50	6.51
China	8.56	3.11	5.38	5.00	5.00	4.60	4.10	4.00	3.67	3.35	3.29
Indonesia	3.70	5.31	5.05	5.00	5.10	5.00	5.10	5.17	5.19	5.22	5.23
Saudi Arabia	6.52	12.00	0.54	2.60	4.60	1.70	5.50	3.65	3.54	3.52	3.55
Middle East and Central Asia	4.69	6.37	2.58	3.10	3.70	0.70	6.50	3.96	3.96	3.82	3.78
Latin America	7.50	4.30	2.33	2.40	2.40	2.40	2.70	2.87	2.86	2.75	2.63
Brazil	4.76	3.02	3.24	3.40	2.30	2.40	2.20	2.35	2.50	2.50	2.50
Euro Area	6.42	3.64	0.44	1.00	1.40	0.90	1.20	1.36	1.24	1.12	1.10
United States	6.15	2.52	2.94	2.80	2.10	2.30	2.20	2.10	1.88	1.75	1.76

Source: IMF- World Economic Outlook Database (April 2026, July 2026)

Note: E-Estimate, P- Projections E-Estimated; India's fiscal year (FY) aligns with the IMF's calendar year (CY). For instance, FY24 corresponds to CY23.

Advanced Economies Group

Advanced economies are projected to grow at around 1.70% in CY26 and 1.80% in CY27, the overall effect on growth in advanced economies of the conflict in the Middle East is modest.

In the **United States**, growth is forecast at about 2.30% in CY26, supported by fiscal measures and lower interest rates, even as the increase in trade barriers since April 2025 continues to weigh on the trade relations.

The **Euro Area** growth is expected to decline in CY26 to 0.90% from 1.40% in CY25 and moderate to 1.20% in CY27, due to negative impact of the war in the Middle East over time even though there was substantial growth in CY25.

Emerging Markets and Developing Economies Group

Emerging and developing economies are expected to fall to 3.80% in CY26 and recover to 4.50% in CY27, due to the global conflicts having a greater net impact on emerging economies than advanced economies.

China's growth remains steady at around 4.60% in CY26 and is expected to fall to 4.10% in CY27 due to higher global oil prices as well as global uncertainty. **India's** growth has been among the fastest-growing major economies, with projections of 6.40% in CY26, driven by strong private consumption and services activity.

Indonesia is expected to maintain consistent growth of around 5.00% over CY26 and 5.10% in CY27. **Saudi Arabia's** growth in CY26 has a downward projection to have a growth rate of 1.70% on account of the damage due to the ongoing tensions. On the other hand, **Brazil's** growth is projected to be 2.40% in CY26 and 2.20% in CY27, due to the war have a small net positive effect in 2026, as a result of the country being a net energy exporter.

Despite the turmoil in the last 2-3 years, India bears good tidings to become a USD 5 trillion economy by CY28. According to the IMF dataset on Gross Domestic Product (GDP) at current prices, the nominal GDP projected to be at USD 4.2 trillion for CY26 and is projected to reach USD 4.5 trillion by CY27 and USD 6.8 trillion by CY30. India's expected GDP growth rate for coming years is almost double compared to the world economy. The Indian economy shows resilience amid global inflation, supported by a stable financial sector, strong service exports, and robust investment driven by government spending and high-income consumer consumption, positioning it for better growth than other economies.

Besides, India stands out as the fastest-growing economy among the major economies. The country is expected to grow at 6.52% in the period of CY25-CY30, outshining China's growth rate. By CY30, the Indian economy is estimated to emerge as the third-largest economy globally, hopping over Japan and Germany. Currently, it is the third largest economy globally in terms of Purchasing Power Parity (PPP) with a ~8.50% share in the global economy, with China on the top followed by the United States.

1.1.1 El-Nino and Economic Growth

The rainfall during the June–September 2026 monsoon season is projected at approximately 90% of the Long Period Average (LPA), indicating a below-normal monsoon. The anticipated emergence of El Niño conditions is

expected to contribute to uneven rainfall distribution and deficient precipitation across certain regions, with a high probability of a moderate-to-strong El Niño event during the season.

El Niño could exert upward pressure on food inflation through its impact on agricultural output and perishable commodities. Erratic weather patterns, elevated temperatures, and heatwaves may adversely affect the production of fruits and vegetables, particularly key inflation-sensitive crops such as tomatoes, onions, and potatoes. Pulse production also remains vulnerable to rainfall deficiencies, potentially leading to supply-side pressures and higher prices.

Historically, deficient monsoons have had a direct impact on agricultural output and economic growth. However, the sensitivity of overall economic activity to rainfall deviations has moderated significantly over time due to structural changes in the economy. Agriculture's contribution to India's Gross Value Added (GVA) has declined from approximately 53.00% in FY1951 to around 18.00% in FY26, reducing the economy's overall dependence on the sector.

States with lower irrigation coverage, higher dependence on rain-fed agriculture, and limited crop diversification are highly vulnerable to rainfall shocks. While the macroeconomic impact of El Niño is expected to remain manageable, its potential implications for agricultural production and food inflation warrant close monitoring. The progress of the monsoon, inflationary trends, and region-specific agricultural stress indicators will remain key factors to watch during the year.

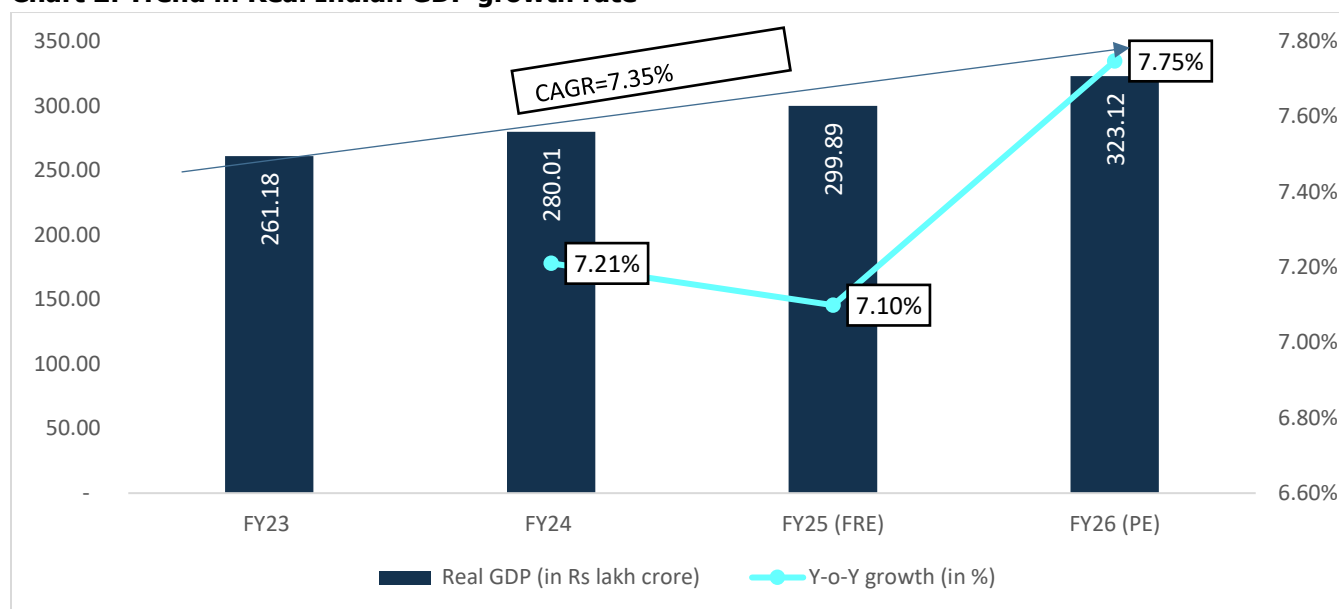
1.2 Indian Economic Outlook

1.2.1 GDP Growth and Outlook

Resilience to External Shocks remains Critical for Near-Term Outlook

India's economy continues to show rapid growth. As per Provisional Estimates, GDP in FY26 is expected to have grown by 7.75%, supported by rising rural demand, better job opportunities and favourable business conditions.

For FY25, First Revised Estimates show a growth of 7.10% (Rs 299.89 lakh crore), led by robust performance in manufacturing, construction and financial services. Consumer spending rose by 7.75%, and government spending increased by 5.50%, both contributing to the overall growth. In FY23, the real GDP stood at Rs 261.18 lakh crore and registered YoY growth of 7.21% in FY24 (Rs 280.01 crore).

Chart 2: Trend in Real Indian GDP growth rate

Source: MOSPI; Note: PE – Provisional Estimates, FRE- First Revised Estimates

GDP Growth Outlook

FY27 GDP Outlook: The Reserve Bank of India (RBI) projects real GDP growth at 6.60% for 2026–27, supported by sustained momentum in the services sector, strong reservoir levels aiding the agricultural sector, and private consumption expected to remain uplifted by discretionary spending.

However, elevated energy and other commodity prices, cost pressures, as well as the travel disruptions in the Strait of Hormuz are likely to affect the growth this year. However, the government is working towards minimising the impact of the supply chain disruptions towards critical sectors to ensure limited interruptions.

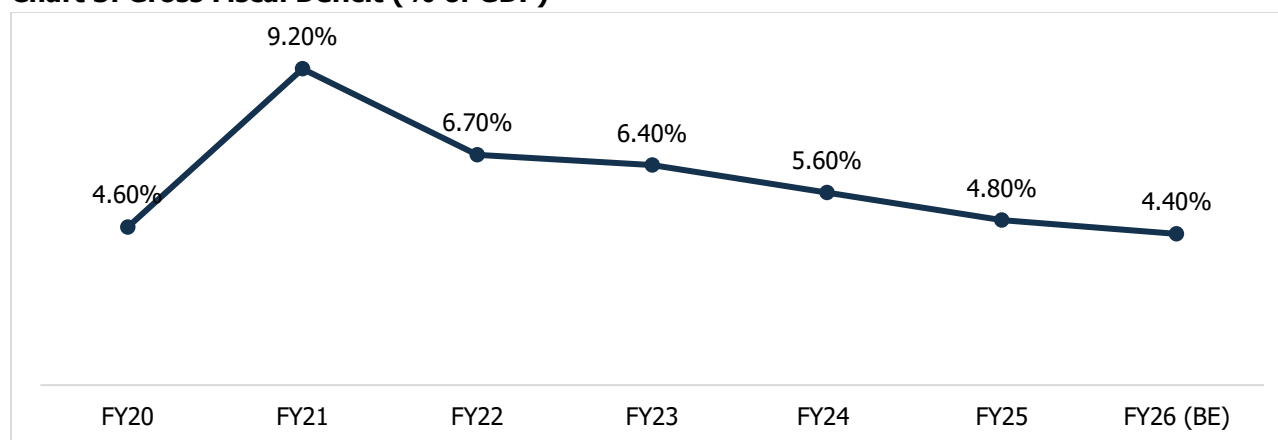
Table 2: RBI's GDP Growth Outlook (Y-o-Y %)

FY27P (Complete Year)	Q1FY27P	Q2FY27P	Q3FY27P	Q4FY27P
6.60%	6.60%	6.30%	6.50%	6.80%

Source: Reserve Bank of India; Note: P- Projected

1.2.2 Fiscal Deficit (as a % of GDP)

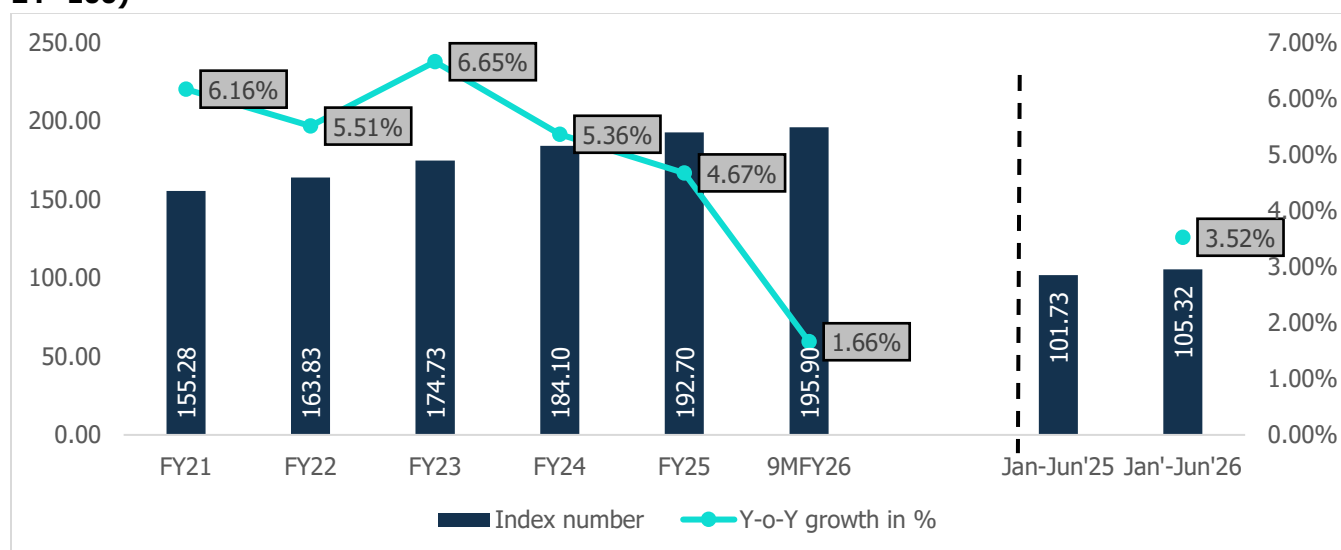
In FY21, India's fiscal deficit was 9.20% due to the impact of COVID-19, since then it has seen a steady improvement is expected to reduce to 4.80% of GDP FY25 (RE), driven by strong economic growth and higher tax and non-tax revenues. The government aims for further fiscal consolidation, setting a target of 4.40% of GDP for FY26 to maintain fiscal prudence.

Chart 3: Gross Fiscal Deficit (% of GDP)

Note: RE-Revised Estimates, BE-Budget Estimates; Source: RBI

1.2.3 Consumer Price Index

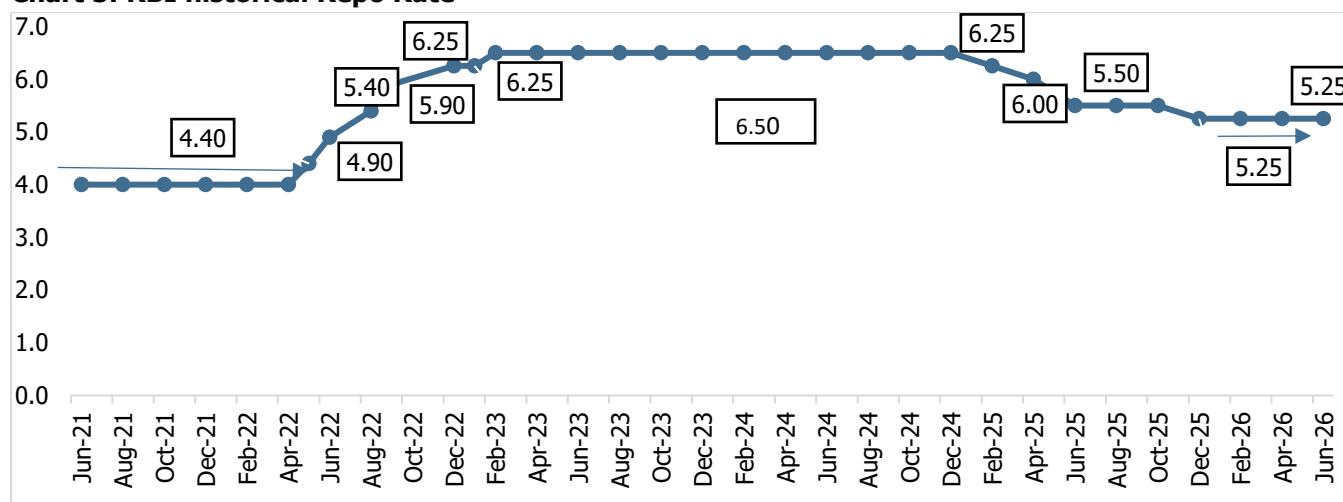
Between January and June 2026, the inflation averaged around 3.50% across the Consumer Price Index. By June 2026, inflation increased to 4.38% on a year-on-year basis, compared with 3.93% in June 2025. Within this, the rural inflation rate stood at 4.74%, while the urban inflation rate was comparatively lower at 3.92%. This indicates an overall modest inflationary trend, with rural areas experiencing relatively higher price pressures than urban regions.

Chart 4: Retail Price Inflation in terms of index and Y-o-Y Growth in % (Base: 2011-12=100, 2023-24=100)

Source: MOSPI

The CPI is primarily factored in by the RBI while preparing their bi-monthly monetary policy. At the bi-monthly meeting held in June 2026, RBI projected inflation at 5.00% for FY27 with inflation during, Q2FY27 at 4.70%, Q3FY27 at 5.90% and Q4FY27 at 5.50%.

Considering the current inflation situation, RBI has maintained the repo rate at 5.25% in the June 2026 meeting of the Monetary Policy Committee (MPC).

Chart 5: RBI historical Repo Rate

Source: RBI

RBI maintained a 'neutral' monetary policy stance, even as MPC noted an increase in geopolitical tensions. The growth is expected to be supported by robust private consumption and investment demand. RBI has adopted for a non-inflationary growth with the foundations of strong demand and supply with a good macroeconomic balance. With volatile trade conditions in view, the domestic growth and inflation curve requires the policies to be supportive.

The India Meteorological Department (IMD) expects a below normal monsoon, rains in most parts of the country, except in some areas of the northeast, southern peninsula, and northwest India which is likely to affect inflation levels.

The prices of petrol and diesel have increased marginally as the refineries have been absorbing the shocks by reducing the excise duty, despite high global crude oil prices. However, a further hike in prices remains monitorable due to high company losses. The rise in energy prices and weather disturbances affecting food prices are upside risks to inflation.

1.2.4 Gross Value Added (GVA)

GVA is the measure of the value of goods and services produced in an economy. GVA gives a picture of the supply side whereas GDP represents consumption. GVA in FY25 was powered by a broad-based rebound across sectors.

In FY26 (PE), real GVA growth of 7.90% is primarily led by manufacturing, Trade, Hotels, Transport, Communication & Services related to Broadcasting. Industry is estimated at 8.50%, supported by a pickup in manufacturing and construction (10.70% and 7.40% respectively). The gap between GDP and GVA growth stood at 0.15 percentage point in FY26, with GDP growing at 7.75% and GVA at 7.90%.

Table 3: Sectoral growth (Y-o-Y% Growth) -at Constant Prices

At constant Prices	FY24	FY25 (FRE)	FY26 (PE)
Agriculture, Forestry & Fishing	2.60	4.20	3.00
Industry	10.90	8.30	8.50
Mining & Quarrying	2.40	11.70	5.20

Manufacturing	12.70	9.30	10.70
Electricity, Gas, Water Supply & Other Utility Services	10.70	2.90	1.70
Construction	9.90	7.30	7.40
Services	7.00	7.90	9.30
Trade, Hotels, Transport, Communication & Broadcasting	10.10	6.60	11.00
Financial, Real Estate & Professional Services	5.50	10.00	10.40
Public Administration, Defence and Other Services	6.80	5.00	5.00
GVA at Basic Price	7.20	7.30	7.90

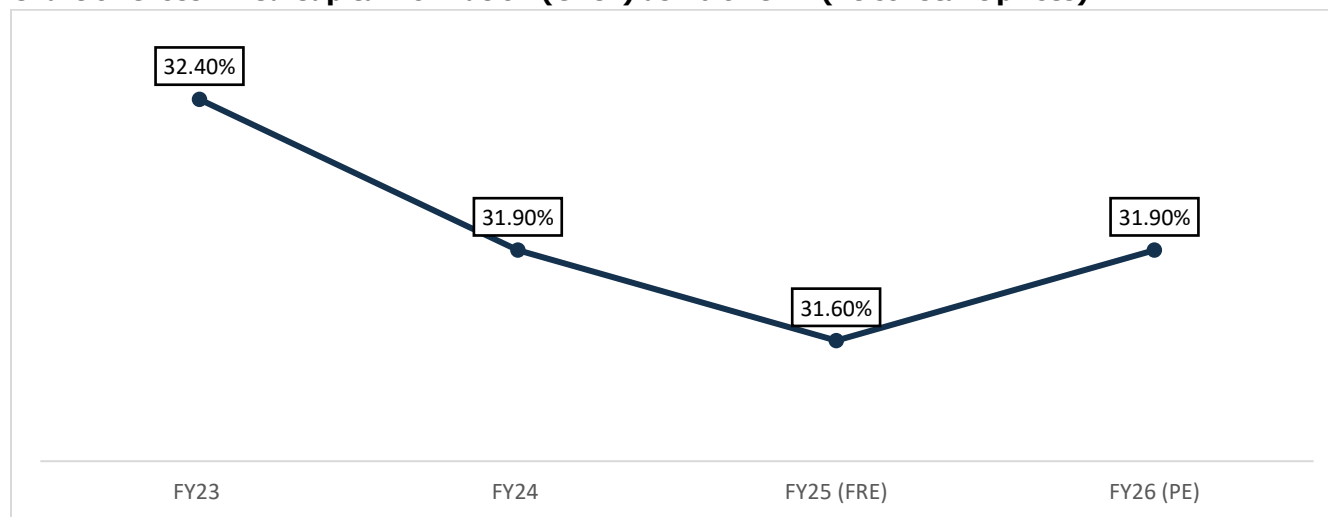
Source: MOSPI; Note: FRE- First Revised Estimates, PE – Provisional Estimates;

The trend for FY24-FY26 is based on new series base year 2022-23.

1.2.5 Investment Trend in Infrastructure

Gross Fixed Capital Formation (GFCF) is a measure of net increase in physical assets. GFCF as a share of GDP eased during FY23–FY25 and was estimated to be broadly stable in FY26. This pattern is aligned with a period in which nominal GDP expanded, while investment growth remained positive, it did not outpace the overall nominal expansion. GFCF rose by 8.86% in FY25 and 9.92% in FY26 in real terms, alongside continued growth in consumption, indicating that the movement in the ratio reflects relative GDP shares rather than a decline in investment activity.

Chart 6: Gross Fixed Capital Formation (GFCF) as % of GDP (At constant prices)



Source: MOSPI; Note: FRE- First Revised Estimates, PE- Provisional Estimates

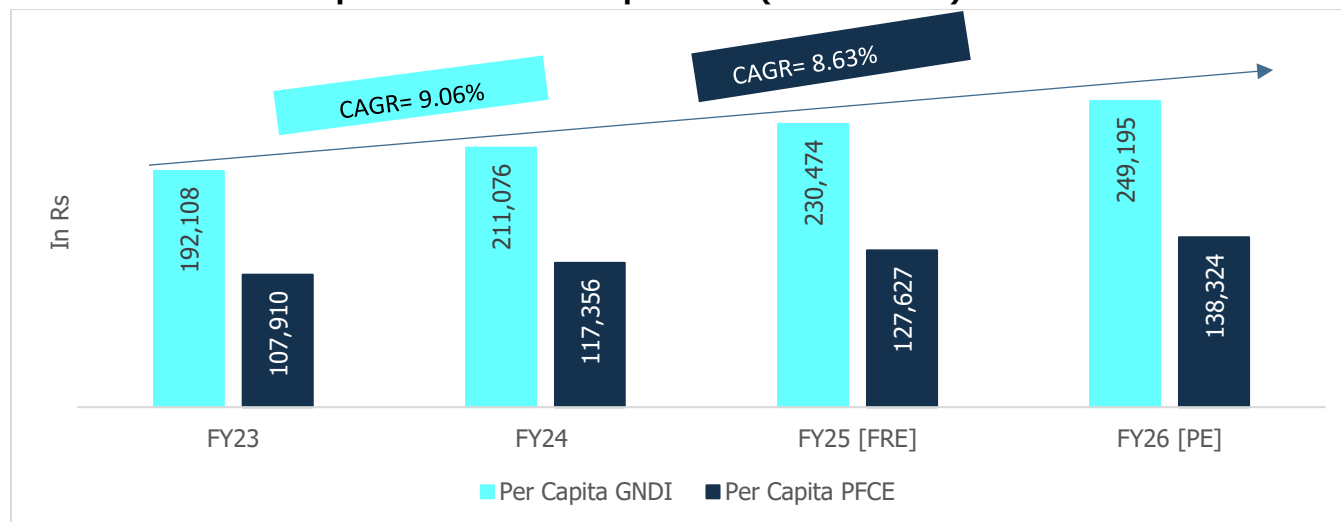
1.2.6 Per capita PFCE and GNDI

- Increasing Disposable Income and Consumer Spending**

Gross National Disposable Income (GNDI) is a measure of the income available to the nation for final consumption and gross savings. Between the period FY23 to FY26, per capita GNDI at current prices registered a CAGR of 9.06%. More disposable income drives more consumption, thereby driving economic growth.

With increase in disposable income, there has been a gradual change in consumer spending behaviour of the country. Per capita Private Final Consumption Expenditure (PFCE), which is measure of consumer spending, has also shown significant growth from FY23 to FY26 at a CAGR of 8.63%.

Chart 7: Trend of Per Capita GNDI and Per Capita PFCE (Current Price)

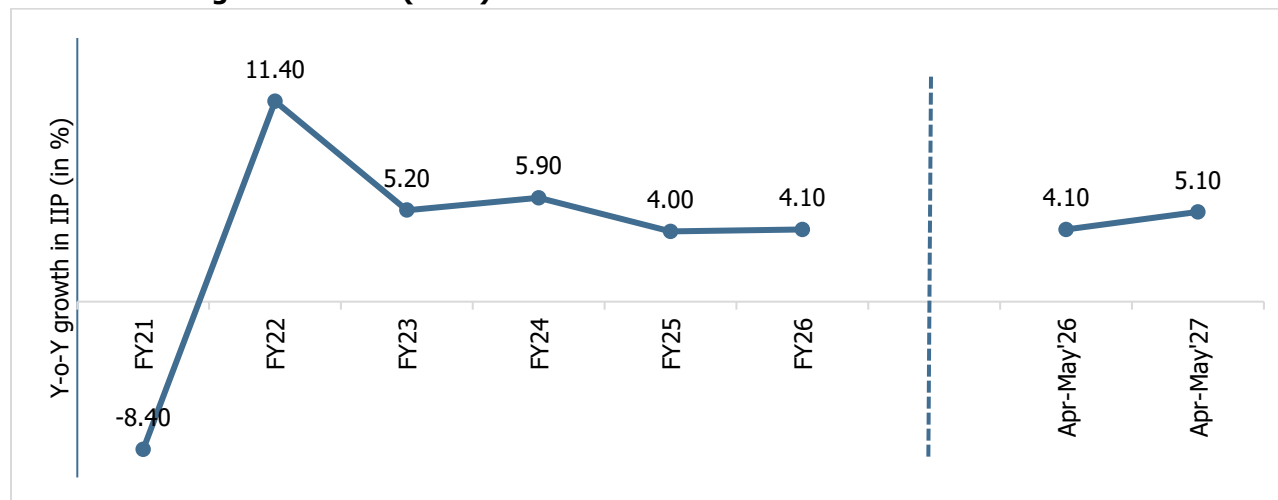


Source: MOSPI; Note: FRE – First Revised Estimates, PE- Provisional Estimates;
The trend for FY23-FY26 is based on new series base year 2022-23

1.2.7 Industrial Growth

The Index of Industrial Production (IIP) in India grew by 4.10% year-on-year from April-May 2026, showing steady but moderate industrial momentum, supported by 5.50% growth in Manufacturing sector and strong growth of 9.90% in Electricity & Gas Supply sector.

Chart 8: Y-o-Y growth in IIP (in %)

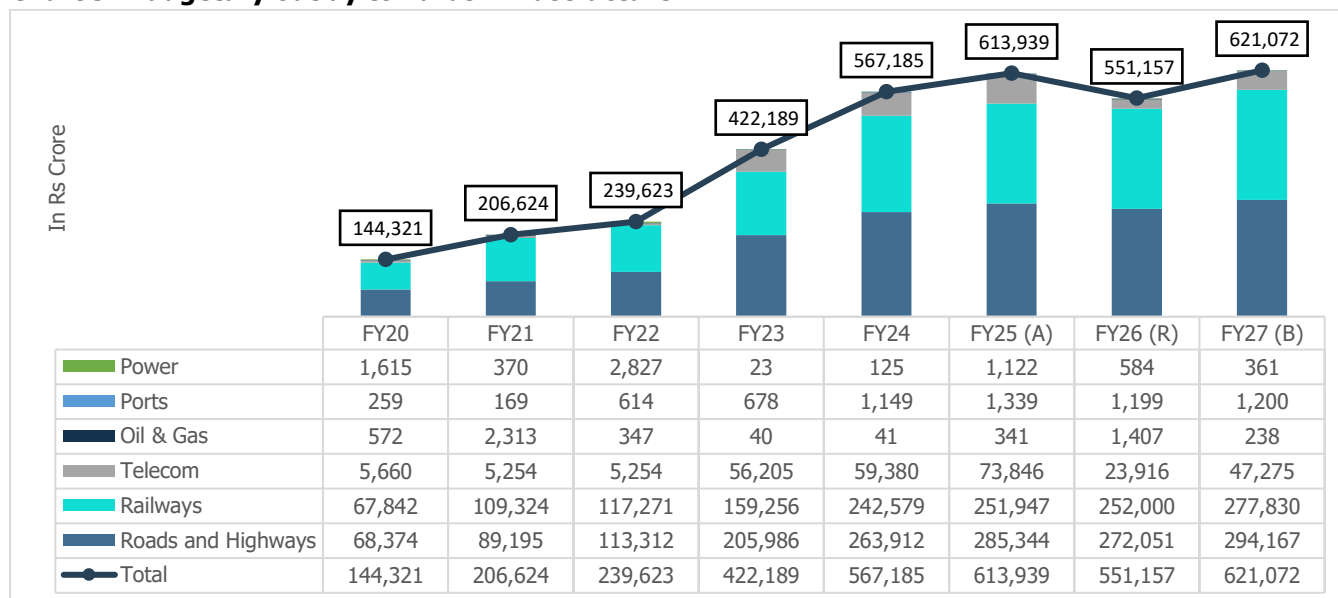


Source: MOSPI

1.2.8 Budgetary expenditure on Infrastructure

With the growing population, the long-term need for robust infrastructure is necessary for economic development. This generates the need for massive investments in the development and modernization of infrastructure facilities, which will not only cater to the growing demand but will also ensure competitiveness in the global market.

Chart 9: Budgetary outlay towards infrastructure



Source: Union Budget FY27 document; Note: A- Actual, R- Revised, B- Budgeted

Some of the key government infrastructure schemes include:

- **Infrastructure financing and asset monetisation (Budget 2026-27)**
 - **Infrastructure Risk Guarantee Fund** announced to strengthen private developer confidence by addressing construction-phase risk.
 - **Dedicated REITs for CPSE assets** announced to accelerate recycling and monetisation of significant CPSE real estate assets, supporting capital redeployment into infrastructure.
 - **Public capex push** continues, with higher Central Government capital expenditure for FY 2026-27 to sustain infrastructure-led growth.
- **Urban infrastructure and city development (Budget 2026-27)**
 - **City Economic Regions (CER)** introduced to support competitive, region-based urban infrastructure and economic agglomerations (Tier II and Tier III focus), with multi-year funding support.
 - **Urban Rejuvenation Mission (including AMRUT and Smart Cities)** continues as the principal umbrella for water supply, sewerage and urban infrastructure investments, with FY 2026-27 allocations provided in the Budget documents.

PMAY-Urban 2.0 remains the primary affordable housing programme for urban areas, with FY27 allocations provided in the Budget documents.

1.3 Concluding Remarks

From a macroeconomic standpoint, India remains one of the most resilient large economies in a challenging global environment. The IMF forecasts GDP growth for India at 6.40% in CY26, far outpacing the estimated CY26 global average of 3.00%. This performance reflects a combination of strong domestic fundamentals, policy stability and a sustained focus on capital formation. While the global economy continues to face uncertainty from geopolitical conflicts, commodity price volatility and rising public debt, India's diversified growth drivers, stable policy framework and expanding export ecosystem position it well to navigate these headwinds.

The key sectors with potential exposure to changes in US tariff policy include engineering goods, electronics, gems and jewellery, pharmaceuticals, textiles and automobiles/auto components, given their material export linkages to the US market.

As of July 2026, India-US trade negotiations are ongoing, and the final Bilateral Trade Agreement (BTA) has not yet been concluded. In February 2026, both countries announced a framework for an Interim Agreement aimed at promoting reciprocal and mutually beneficial trade. Under this framework, the United States proposed an 18.00% reciprocal tariff rate on Indian goods, while also indicating the possible removal of tariffs on sectors such as generic pharmaceuticals, gems and diamonds, aircraft parts and certain engineering products, subject to finalization of the agreement.

India continues to strengthen its position through diversification of trade partnerships and expansion of FTAs with the European Union, the United Kingdom, EFTA and other key economies. During FY26, India also signed the Comprehensive Economic Partnership Agreement (CEPA) with Oman and formally commenced negotiations for an FTA with the Gulf Cooperation Council (GCC), further strengthening its trade engagement with Middle Eastern economies. These initiatives, together with India's growing manufacturing capacity and deeper integration into global supply chains, are expected to enhance the country's competitiveness across sectors such as electronics, textiles, pharmaceuticals and auto components.

The US and Iran conflict remains ongoing and uncertainties around the same remains. The Iran conflict has led to an increase in prices of consumer products in India due to potential higher fuel, freight and input costs, which can make everyday goods like FMCG items, plastics and packaged foods more expensive. Disruptions in shipping and fertiliser supplies are also pushing up food prices, affecting imports of agricultural inputs and leading to costlier food products for consumers. Overall, delays in trade routes and rising logistics costs are reducing availability and increasing prices of imported consumer goods, especially from Gulf-linked supply chains. Overall, this is leading to supply shortages, rising costs, and production slowdowns in India's chemical and pharma sectors, with the impact likely to worsen if the conflict continues. Prolonged geopolitical tensions or conflict in the region could lead to sustained increases in crude oil and LPG prices, which may translate into higher input costs across industries and contribute to inflationary pressures in the Indian economy.

Domestically, a below-normal monsoon and potential El Niño conditions may contribute to higher food inflation, which could affect household spending and consumer sentiment, particularly in rural markets. Elevated prices of essential commodities may reduce discretionary spending; however, strong domestic demand, urban consumption, and rising income levels are expected to support overall growth in the consumer sector.

Policy momentum remains strong. The 56th meeting of the GST Council marked a major structural reform by proposing a simplified two-rate system of 5.00% and 18.00%, replacing the earlier four-slab framework, along with a 40.00% demerit rate for luxury and sin goods. This rationalisation aims to reduce compliance burdens, enhance efficiency, and stimulate private consumption. Together with recent revisions in personal income tax rates, these measures are

projected to release savings exceeding Rs 2.5 lakh crore into the economy, supporting demand and easing inflationary pressures.

The Union Budget's allocation of Rs 12.20 lakh crore for capital expenditure in FY27 further reinforces the government's commitment to infrastructure-led growth. Public investment is expected to catalyse private sector activity, evidenced by rising project announcements and growing imports of capital goods. Improving rural demand, supported by healthy monsoon progress, favourable sowing conditions, and adequate reservoir levels, provides additional tailwinds for consumption and investment.

2 Road Infrastructure in India

2.1 Overview of Road and Airport infrastructure in India

The infrastructure sector is a key driver of the Indian economy. The sector is highly responsible for propelling India's overall development. Accordingly, it garners intense focus from the government for initiating policies that would ensure the time-bound creation of world-class infrastructure in the country. In other words, the infrastructure sector acts as a catalyst for India's economic growth. It complements the allied sectors like townships, housing, built-up infrastructure, and construction development projects. The infrastructure sector includes power, bridges, dams, roads, and urban infrastructure.

Furthermore, the Indian infrastructure sector is projected for continuous growth. This is driven by urbanization, economic expansion, and the need to upgrade the ageing infrastructure. Additionally, fuelled by significant government investments and strategic initiatives aimed at strengthening the nation's economic framework. For the fiscal year 2026–27, the government allocated a record Rs. 12.2 lakh crore, underscoring its dedication to infrastructure development as a cornerstone of economic progress and employment generation.

The government is also prioritising multi-modal logistics parks under its PM Gati Shakti National Master Plan. This initiative integrates key projects such as Bharatmala, Sagarmala, and UDAN, ensuring streamlined infrastructure planning and monitoring. Public-Private Partnerships (PPPs) are being emphasised as critical to achieving India's goal of becoming a USD 5 trillion economy, particularly in the development of airports, ports, highways, and logistics parks. Overall, the infrastructure sector is projected to grow at a CAGR of approximately 9.80% during CY25-CY30F, driven by investments across roads and highways, railways, metros, and the water supply and sanitation sectors. These ambitious initiatives collectively position India's infrastructure sector as a pivotal driver in its aspiration to achieve developed nation status by 2047.

Road Infrastructure in India

India has the second-largest road network in the world, with about 63,45,830 km as of FY26. This comprises national highways, expressways, state highways, major district roads, other district roads, and village roads. To accelerate the country's growth, the development of national highways has been the key focus area. On the other hand, state highways, district and rural roads continue to be a large part of the overall road network.

Table 4: Road Network of Past 6 Years (In Km)

Particulars	FY21	FY22	FY23	FY24	FY25	FY26
National Highways	1,36,440	1,40,995	1,44,955	1,46,145	1,46,204	1,46,572
State Highways*	1,76,818	1,71,039	1,67,079	1,79,535	1,79,535	1,79,535
Other Roads*	59,02,539	60,59,813	60,19,757	60,19,757	60,19,723	60,19,723
Total	62,15,797	63,71,847	63,31,791	63,45,437	63,45,462	63,45,830

Source: Ministry of Road Transport and Highways of India Annual Reports, CareEdge Research Note: *The data for SH and other roads is taken from Basic Road Statistics 2023, since then the data has not been updated in MORTH annual report.

Road transportation, the most common mode of transportation in India, accounts for about 87.00% of passenger traffic. Despite having a network of 1,46,572 km, Indian national highways account for 2.31% of total road network and ~ 40.00% of total road traffic. the remaining road network accounts for the balance traffic.

The road construction and infrastructure industry in India is highly competitive, driven by large public investments and private sector participation. Companies compete not only on cost and execution capability but also on innovation, adoption of advanced technologies and compliance with sustainability and quality standards.

The growth in India's highway segment has materially outpaced the broader road sector over the last decade. The National Highway network expanded by about 60.56% from 91,287 km in FY14 to 1,46,572 km by March 2026, while the length of four-lane and above National Highways increased by nearly 147.76%, from 18,371 km in 2014 to 45,516 km in March 2026. This reflects not only an increase in road length but also a significant improvement in highway capacity through widening, multi-laning and development of high-speed corridors.

The expansion of multi-lane highways creates a sizeable requirement for high-quality road marking systems, as marking demand is driven more by lane-kilometres and road configuration than by route length alone. Four-lane, six-lane and eight-lane highways require extensive centreline and lane-line markings, edge lines, directional arrows, chevrons, junction markings, pedestrian markings, toll-plaza markings and other safety delineation. High-speed corridors also require markings with higher retro reflectivity, durability, skid resistance and night-time visibility, making performance-based thermoplastic and other specialised marking systems increasingly important.

Further, road markings are subject to wear from traffic loading, weather conditions and road maintenance activity, creating a recurring requirement for reapplication and maintenance in addition to fresh application on newly constructed roads. The quality and durability of road markings are particularly critical on highways, where high traffic volumes and vehicle speeds increase the importance of clear lane guidance, visibility and work-zone delineation. Repairs and maintenance on such corridors can be operationally challenging, as even relatively minor interventions may require lane closures or diversions and can lead to congestion or increase accident risk if temporary markings, warning signs and visual guidance are inadequate. Consequently, the rapid expansion and upgradation of the National Highway network, particularly the increasing share of four-lane and above roads, is expected to remain an important structural demand driver for high-quality road marking paints, thermoplastic compounds, glass beads and specialised road marking application services.

Airport Infrastructure in India

The Indian airport sector has witnessed significant growth and transformation driven by a confluence of factors like rising passenger traffic, private sector participation, technological advancements, and government focus on improving the airport infrastructure. The domestic aviation industry in India has positioned itself as the third-largest domestic aviation market globally in terms of domestic air traffic. There have been several notable developments

in the sector, such as the construction of big-ticket greenfield airports, the privatization of airports, the launch of a new airline, and the formulation of a drone policy, which have contributed to the positive sentiment.

Airport infrastructure, as part of the aviation industry, plays a significant role in the development of the national economy due to its globalized nature. Entry of private players in this industry in India likely boosted the concept of 'Airport Retailing'. Whereas the Regional Connectivity Scheme "Ude Desh ka Aam Nagrik" (RCS UDAN) scheme, has helped air traffic grow, with new routes being awarded, and more airports being operationalised. As of July 2026, India has a total of 165 operational airports. International airports, such as Indira Gandhi International Airport (Delhi), Chhatrapati Shivaji Maharaj International Airport (Mumbai), Kempegowda International Airport (Bengaluru), Chennai International Airport, and Rajiv Gandhi International Airport (Hyderabad), serve as key global gateways for passenger and cargo traffic. Domestic airports, including Pune Airport, Jaipur Airport, Bhopal Airport, and Bhubaneswar Airport, facilitate regional connectivity and play a crucial role in domestic tourism and business travel. Custom airports, such as Surat Airport and Amritsar Airport, handle specific international cargo and passenger movement, supporting trade and commerce.

Table 5: Total Operational Airports in India

Airports in India	No. of Airports
International Airports (Incl. JVs)	36
Domestic Airports	118
Custom Airports	11
Total Operational Airports	165

Source: Ministry of Civil Aviation; Number of Airports as on 07 July 2026

The major Indian airports are undergoing huge investments projects. These investment projects include construction of new terminals, expansion of existing terminals, and renovation/upgradation of existing facilities, construction of new runways, extension of existing runways, and rehabilitation of existing runways. Airport operators and developers, including the Airports Authority of India (AAI), incurred capital expenditure of Rs 968.43 billion during FY20-FY25, exceeding the planned investment of Rs 916.37 billion. Of the total expenditure, AAI accounted for Rs 288.65 billion, while private and PPP airport developers contributed Rs 679.78 billion. Further, the Government launched the Modified UDAN Scheme in July 2026, following its approval in March 2026. The scheme has an outlay of Rs 288.40 billion over FY27-FY36 and envisages development of 100 airports from existing unserved airstrips and 200 modern helipads.

This expenditure covered development of greenfield airports, construction and expansion of terminal buildings, runway strengthening and expansion, aprons, air navigation infrastructure and other airport facilities. Major upcoming airports in India include Purandar Airport (near Pune, in early development), Jewar Airport, and Dholera International Airport (part of Dholera Smart City, aiming to be a regional hub). Apart from that Chennai International Airport (Tamil Nadu) is expanding with Phase II, including a new terminal and runways, increasing capacity to over 60 million passengers annually

Besides, the sector is undergoing rapid transformation, driven by digitalization, infrastructure expansion, and sustainability initiatives. Airports and airlines are leveraging advanced technologies such as biometrics, contactless screening, and digital boarding to enhance passenger efficiency. The sector has demonstrated strong resilience post-COVID-19, with domestic market expansion and recovering international travel reinforcing its global position. Infrastructure development, including terminal expansions, new cargo terminals, and greenfield airports, is accelerating alongside rising passenger and cargo traffic, fuelled by economic growth, higher disposable incomes, and the e-commerce boom. Sustainability remains a key focus, with the Ministry of Civil Aviation (MoCA) implementing carbon neutrality and net-zero emission targets, leading to notable achievements such as ACI Level 4+ accreditation for major airports and 66 Indian airports operating on 100.00% green energy. These government-

driven policies, coupled with private sector investments, will further modernize India's aviation infrastructure and strengthen its competitiveness on the global stage.

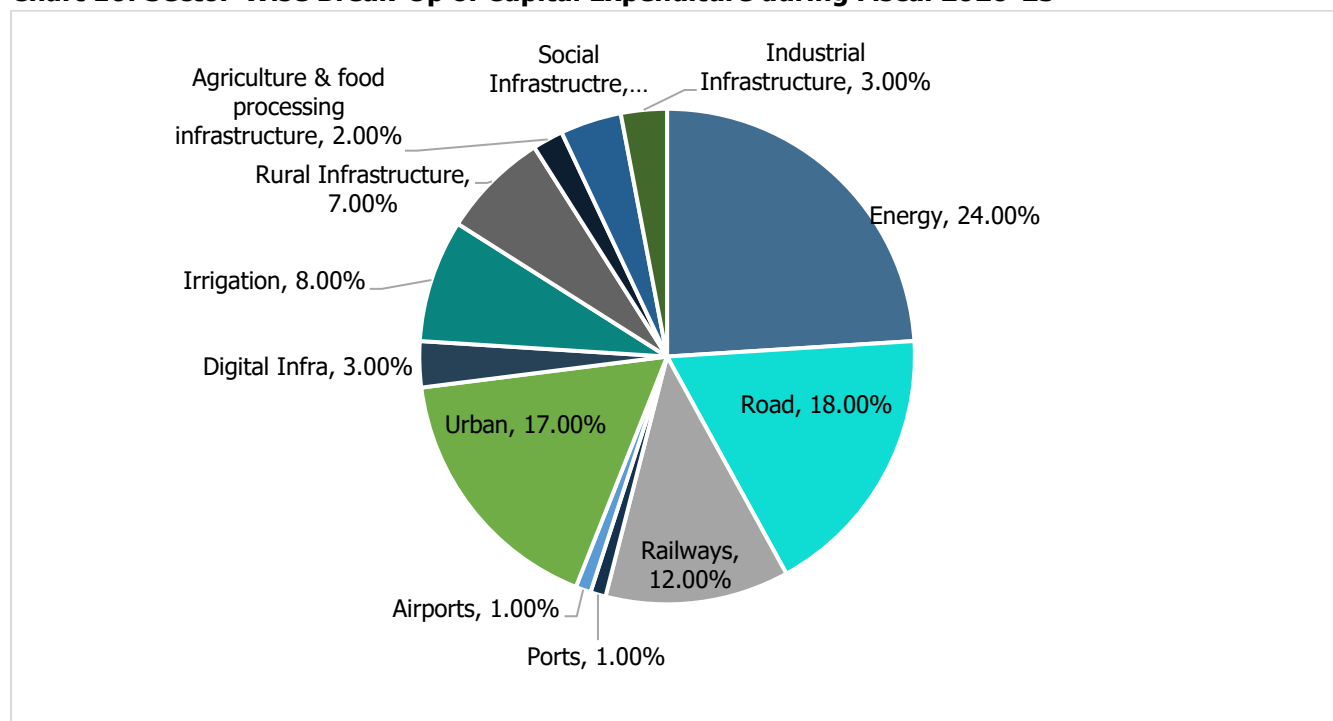
2.2 Investment in Infrastructure

Infrastructure development is essential to meet the nation's current and future needs. The government has introduced the National Infrastructure Pipeline (NIP) combined with other initiatives such as 'Make in India' and the production-linked incentives (PLI) scheme to augment the growth of the infrastructure sector. Historically, over 80% of the country's infrastructure spending has gone towards funding for transportation, electricity, water, and irrigation. Under the NIP, the Centre contributes 39.00% of the funding, while state governments and the private sector account for 40.00% and 21.00%, respectively.

To achieve these growth objectives, the NIP was launched with a projected investment of approximately Rs 111 lakh crore (USD 1.5 trillion) for the period FY 2020–2025. This initiative aims to provide world-class infrastructure nationwide and enhance the quality of life for all citizens. It also envisages improving project preparation and attracting domestic and foreign investment in infrastructure. NIP was launched with 6,835 projects, which has expanded to over 9,000 projects covering 34 infrastructure sub-sectors.

While transportation, electricity, and water remain primary focus areas, the government is also addressing evolving demands across other sectors. These include housing, water and sanitation, digital infrastructure, and transportation services. Meeting these demands will not only drive economic growth but also improve living standards and enhance the competitiveness of key sectors.

Chart 10: Sector-Wise Break-Up of Capital Expenditure during Fiscal 2020-25



Source: NITI Aayog's report on National Infrastructure Pipeline

During the fiscals 2020 to 2025, sectors such as energy (24.00%), roads (18.00%), urban (17.00%), and railways (12.00%) amount to around 70.00% of the projected capital expenditure in infrastructure in India. NIP has involved

all the stakeholders in a coordinated approach to infrastructure creation in India to boost short-term as well as potential GDP growth.

The sector-wise breakup is provided in the below table:

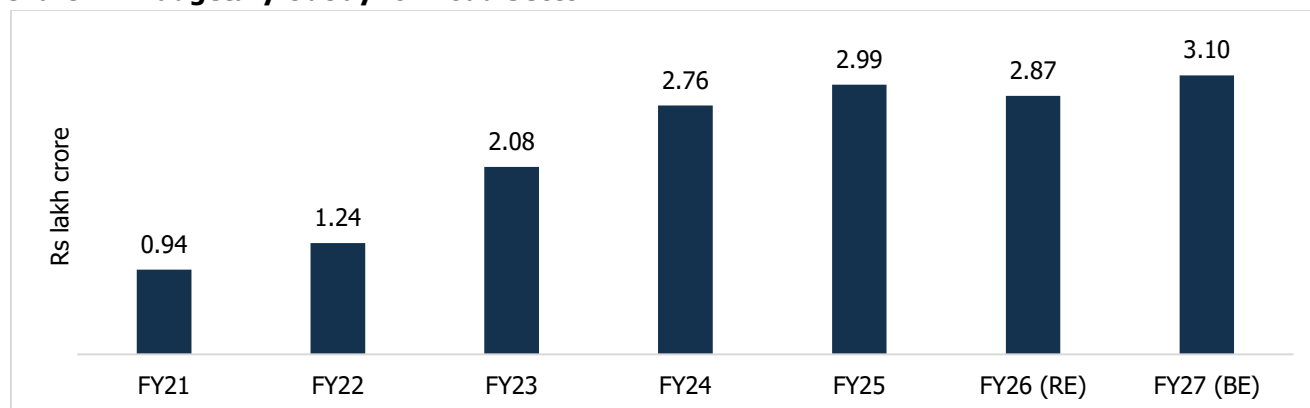
Table 6: National Infrastructure Pipeline Sectoral Split of Investments (Rs lakh crore)

Sector	FY20	FY21	FY22	FY23	FY24	FY25	No Phasing	Total
Roads	3.33	3.83	3.57	2.53	2.41	3.33	1.35	20.34
Urban	2.98	4.62	4.04	2.35	2.17	1.60	1.43	19.19
Railways	1.33	2.62	3.09	2.74	2.21	1.68	-	13.68
Irrigation	1.14	2.01	1.76	1.37	1.15	0.70	0.81	8.94
Rural Infrastructure	1.40	1.77	2.11	1.12	1.07	0.27	-	7.74
Social Infrastructure	0.57	0.78	0.85	0.55	0.46	0.26	0.46	3.93
Digital Infrastructure	0.78	0.62	0.55	0.39	0.38	0.38	-	3.10
Industrial Infrastructure	0.17	0.41	0.43	0.34	0.23	0.11	1.39	3.07
Agriculture and Food Processing Infrastructure	0.26	0.26	0.26	0.24	0.24	0.23	0.19	1.69
Airport	0.19	0.22	0.25	0.21	0.25	0.05	0.26	1.43
Ports	0.13	0.18	0.21	0.16	0.08	0.10	0.36	1.21
Total Infrastructure	12.29	17.32	17.10	12.00	10.65	8.71	6.25	84.32
Power	1.64	2.26	2.22	2.23	2.25	2.11	1.39	14.10
Renewable Energy	0.31	1.51	1.44	1.70	2.17	2.17	-	9.30
Petroleum and Natural Gas	0.27	0.44	0.48	0.42	0.23	0.11	0.01	1.95
Atomic Energy	0.12	0.21	0.28	0.33	0.33	0.28	-	1.56
Total Energy	2.34	4.42	4.42	4.68	4.98	4.67	1.40	26.90

Source: NITI Aayog's report on National Infrastructure Pipeline

2.3 Budget Announcement for Road Sector

Road construction plays a vital role in developing infrastructure, boosting the economy, and creating jobs. The government is putting a lot of emphasis on infrastructure. Overall, though, MoRTH's budget increased to Rs 3.10 lakh crore in the FY27 budget estimate, up from Rs 2.87 lakh crore in the revised estimate for FY26. In addition, the capital expenditure for the MoRTH has increased to Rs 2.94 lakh crore in FY27, as compared to the revised estimate for FY26. It is expected that the centre is focusing on asset monetisation along with increasing the share of BOT-Toll projects to boost Capex in the sector.

Chart 11: Budgetary Outlay for Road Sector

Source: Union Budget Analysis, CareEdge Research

The Government of India continues to support road infrastructure through sustained budgetary provisioning for national highways development and maintenance.

- In FY27 budget, Centre has announced setting up an Infrastructure Risk Guarantee Fund to strengthen confidence of private developers for construction-phase risks. This is relevant for PPP road projects where construction and completion risks can affect lender appetite and bid aggressiveness.
- The budgetary outlay of Rs 1.87 lakh crore towards the NHAI for FY27 has increased by 10% as compared to FY26 revised estimates.
- In FY27 budget, Rs 18,361 crore is budgeted to be transferred from National Investment Fund, 84% higher than FY26 revised estimates. This entire amount is to be spent on SARDP-NE, supporting road connectivity in the North-Eastern Region.

2.4 Tunnel Infrastructure in India

Tunnel construction across road, rail, water, and energy projects has risen, and with it the need for stronger fire safety and asset protection inside enclosed corridors. Operators now require high-visibility, retro-reflective markings—lane lines, chevrons, hazard hatching, and wet-night edge lines—plus anti-skid colour surfacing on curves and ramps to cut crash risk. Escape routes are increasingly marked with photoluminescent guides to support quick evacuation and emergency response. Structures and MEP support also need protective coatings, including intumescent or fire-retardant systems, smoke-resistant finishes, and corrosion- or chemical-resistant linings. Because shutdown windows are short, agencies prefer fast-curing thermoplastic or cold-plastic systems and use motorized spray machines ("spray motors," typically airless rigs) for rapid, even application with controlled overspray in confined spaces. Together, these requirements are lifting multi-year demand for road-marking paints and allied protective coatings in tunnel assets.

Table 7: Key Ongoing and Upcoming Tunnel Projects in India

Project Name	Sub Industry	Cost (Rs. Cr.)
Water Tunnel (Ghatkopar WWTF-Bhandup Complex) Project [Package-I]	Water & Sewerage Pipeline & Distribution	3,216.0

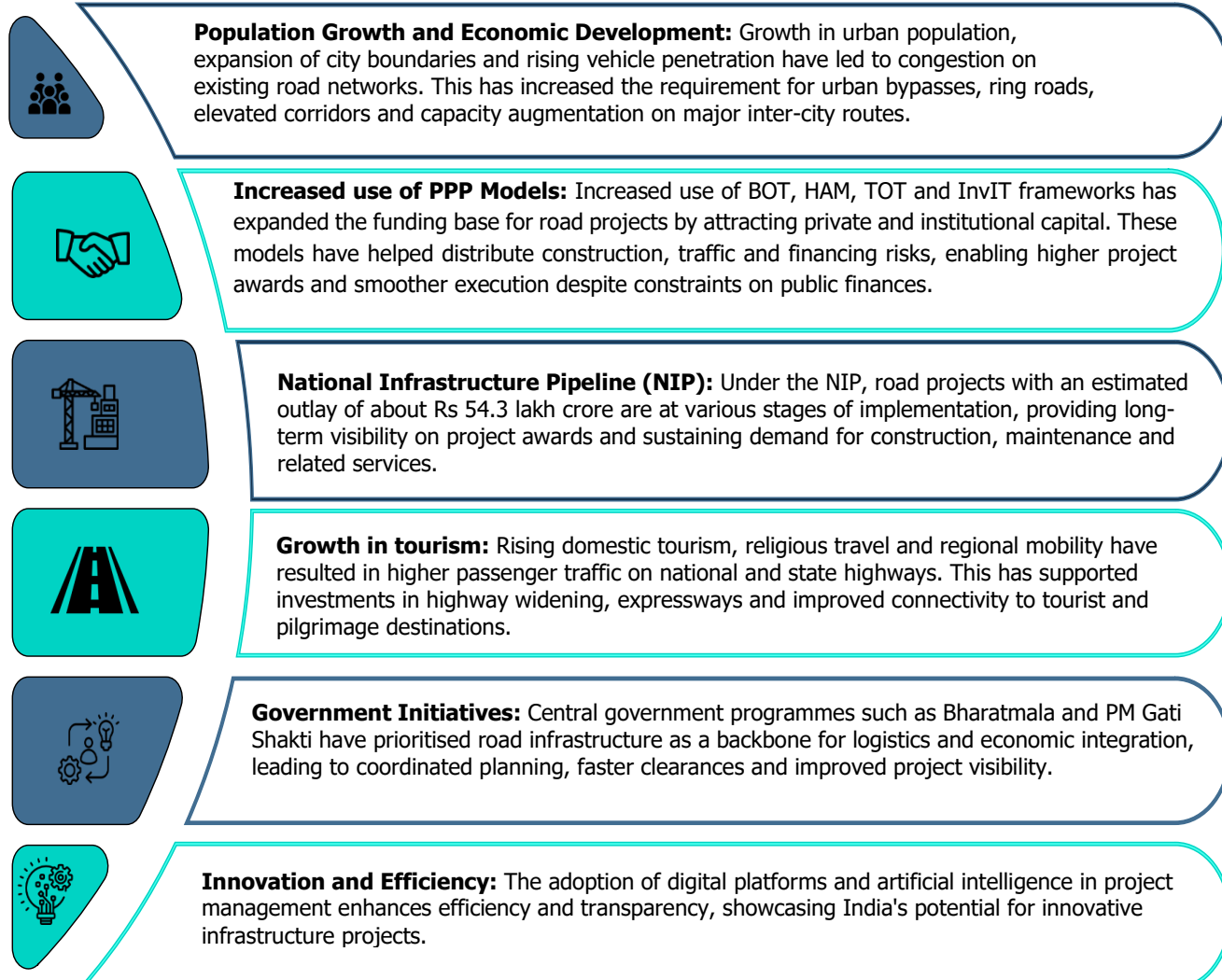
Underground Tunnel (Chembur-Wadala) Project	Water & Sewerage Pipeline & Distribution	1,125.0
Water Tunnel (Jite-Vindhane) Project	Water & Sewerage Pipeline & Distribution	N.A
Zojila Tunnel Project	Roadways	6,808.7
Itarsi-Nagpur 3rd Railway Line Project	Railways	2,882.9
Water Tunnel (Hetawane Dam-WTP Jite) Project	Water & Sewerage Pipeline & Distribution	1,042.0
Tunnel (Kasheli Bhiwandi-Mulund Octroi Naka) Project	Water & Sewerage Pipeline & Distribution	1,899.4
Tunnel (NH-244) Project	Roadways	91.3
Tunnel (Orange Gate-Marine Drive) Project	Roadways	9,158.0
Kharghar-Turbhe Tunnel Link Road	Roadways	2,195.0

Source: Projects Today

Accordingly, expansion in hydropower capacity, underground rail metro projects, Bharatmala, Chardham Connectivity, AMRUT, and the Smart Cities Mission are expected to provide chances to tunnel contractors and consultants in the coming years. Also, most upcoming tunnel projects are of longer lengths, larger diameters, and even higher contract values, which is reflected in tunnelling project size with a substantial increase.

2.5 Drivers and Challenges for Road Infrastructure

Drivers



Challenges

Despite the government's continuous support by way of financing and amendments in the PPP model framework, few challenges still persist for the sector.

- Delay in land acquisition and receipt of approvals for road construction:** Land acquisition remains a key implementation challenge for road projects due to procedural requirements, disputes over compensation, rehabilitation and resettlement requirements, encumbrances and delays in obtaining possession of the required land. The compensation framework under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 has increased compensation and rehabilitation obligations associated with land acquisition, resulting in higher land acquisition outlay for the government. Further, delays in securing requisite land and statutory approvals can defer project commencement and construction, resulting in time and cost overruns and affecting project execution and, particularly in PPP projects, project viability.

- **Mismatches between Project Cashflows and Debt Repayment Tenure:** Revenue from large infrastructure projects is spread over 20-30 years whereas the loan for the same project is for 10-15 years. This results in cash flow mismatches in the initial years of operations till the project stabilizes, thereby resulting in private players funding cashflow mismatches from their own sources.
- **Limited private sector participation in BOT projects due to past financial stress; however good participation seen in HAM projects awarded in past few years:** Due to failed BOT projects on account of lower than-estimated traffic volumes or delays in project completion due to approvals/ land acquisition, private players have come under financial stress due to significantly leveraged balance sheets in anticipation of high levels of project revenue growth. However, road authority has been awarding projects under HAM wherein the risks are limited, and lower funding is required because 40.00% of the project cost is provided by the NHAI in 10 instalments based on the milestone achieved. Also, in the remaining 60.00% of the project cost, the developer needs to finance only 20-25% and the rest can be raised on debt. Hence, decreased financial stress.
- **Cautious bank lending approach to road sector, due to highly Stressed Loan Portfolio in the past:** With higher debt exposure to road project and many projects getting stuck or delayed resulted in loans turning into non-performing assets (NPAs), which had contracted the lending capacity of banks. With lower than anticipated revenues, the private players' debt servicing capacity has been impacted. To mitigate the risk of failure of the company, restructuring of loans has been opted by the private players. Restructuring of loans for the first time does not impact asset classification but subsequent restructuring leads to NPA recognition in the books of financial institutions. Hence, banks have become cautious in terms of lending to road sector.
- **Toll collection and willingness of users to pay toll:** The sector is susceptible to end user's willingness to pay toll, as there have been instances of people skipping toll payments, backed by regional groups or political parties. This in turn impacts the toll collection efficiency and revenues from the road projects, thereby adversely impacting the project cashflow position.
- **Significant NHAI Debt:** NHAI's funding model has relied largely on market borrowings to support asset creation under EPC and HAM projects, resulting in elevated debt levels. Outstanding debt peaked at about Rs 3.49 lakh crore in FY22. Subsequently, reduced dependence on external borrowings and increased use of asset monetisation led to an improvement in leverage, with debt declining to about Rs 2.45 lakh crore by FY25 and it is expected to reach below Rs 2 lakh crore by FY26. Despite this moderation, absolute debt levels remain high. Given NHAI's strategic role in national infrastructure development and the road sector's importance in addressing connectivity gaps and supporting economic growth, large-scale programmes such as Bharatmala continue to require sustained funding, keeping balance sheet pressures a key consideration for the sector.

3 Road Safety Industry

3.1 Overview of the Industry

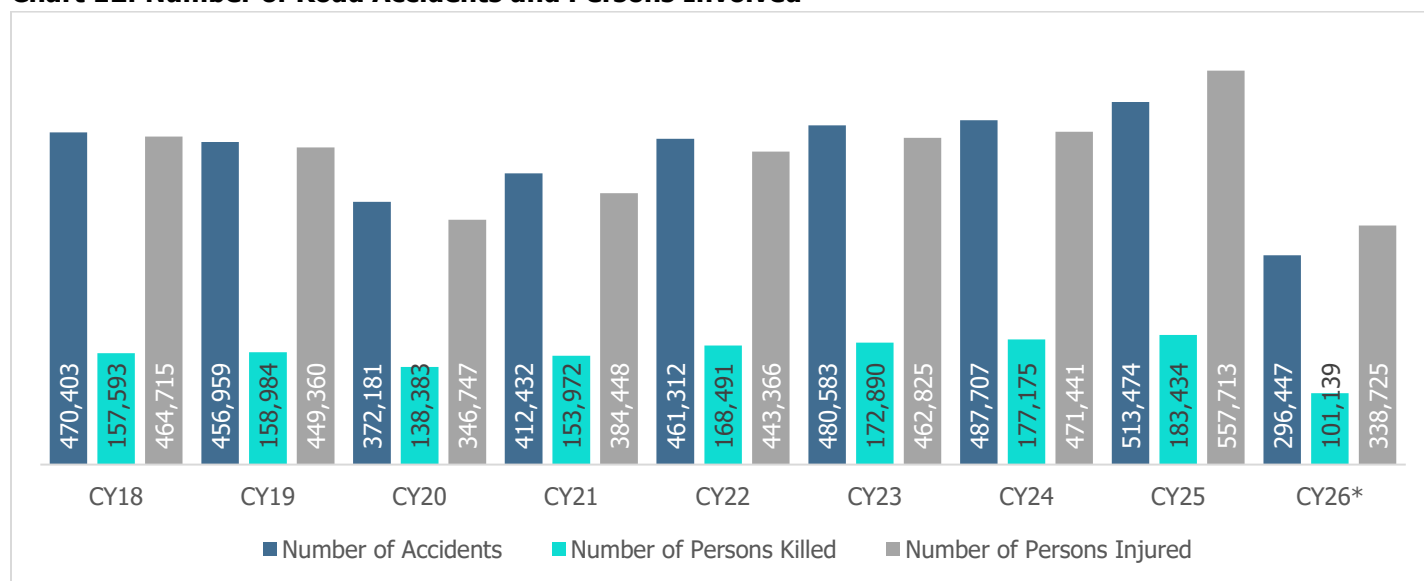
India has the second largest road network in the world - with state highways comprising 2.83%, followed by national highways at 2.31%. Other roads comprise around 94.86% of the total road network in India. This vast transportation network plays a critical role in economic growth by facilitating trade, mobility, and connectivity.

However, rapid urbanization and motorisation have led to significant road safety challenges, making India one of the most accident-prone countries globally. The high rate of road accidents has propelled the demand for road safety solutions, infrastructure improvements, and stricter enforcement of traffic regulations. The road safety industry in India encompasses several key components, including traffic management systems, vehicle safety technologies, emergency response mechanisms, and policy-driven interventions.

The rising incidence of road accidents remains a key driver of demand for road safety solutions and infrastructure in India. The country continues to record a high number of road accident fatalities, accounting for around 10.00% of road accident deaths globally. In CY25, India reported 5,13,474 road accidents, resulting in 1,83,434 deaths and 5,57,713 injuries, compared with 4,80,583 accidents, 1,72,890 deaths and 4,62,825 injuries in CY23. This indicates a continued increase in both accident frequency and severity.

Rising vehicle penetration, particularly of two-wheelers, remains an important contributor to road accident fatalities. Rapid urbanisation, higher traffic density and growing congestion are also increasing the need for improved traffic management systems, road engineering measures, surveillance and safety infrastructure. Road safety remains a key policy priority, with the Government targeting a 50.00% reduction in road accident fatalities by 2030.

Chart 12: Number of Road Accidents and Persons Involved

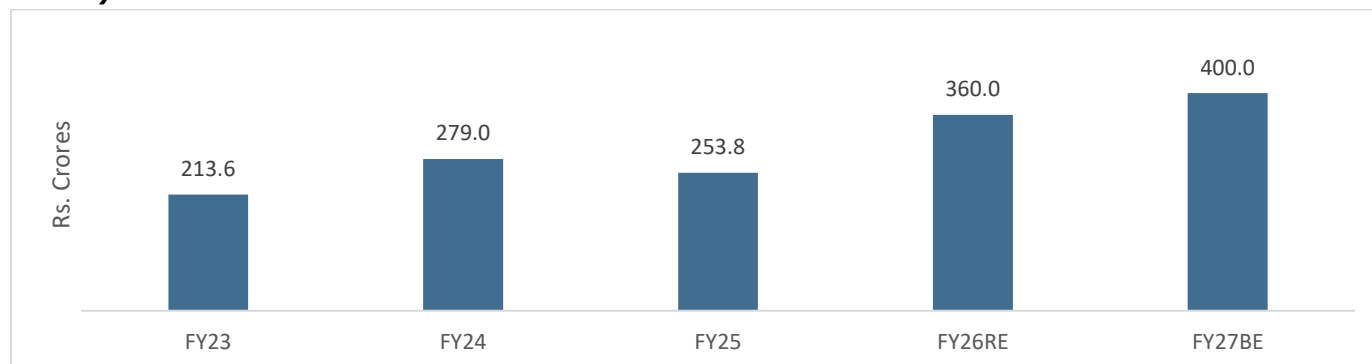


Source: MoRTH FY26 Annual Report, Note: * Data as on 05.01.2026, Data for the year 2025 and 2026 upto 27.07.2026 is as per eDAR.

The Ministry of Road Transport & Highways has undertaken several initiatives to address road safety. The government-led initiatives include the Road Safety Advocacy Scheme, which provides financial assistance for awareness programs, and the establishment of Driving Training Centres (DTCs) across the country. Road engineering measures include mandatory Road Safety Audits (RSAs) for National Highways, black spot rectifications, and the implementation of the electronic Detailed Accident Report (e-DAR) project for centralized accident data management. Vehicle safety enhancements mandate airbags for front-seat passengers, safety measures for children on motorcycles, and the installation of Seat Belt Reminders, Reverse Parking Alert Systems, and Anti-Lock Braking Systems (ABS) for specific vehicle categories. Additionally, policies such as Motor Vehicles (Amendment) Act, 2019 enforcing strict penalties and electronic monitoring of traffic violations are playing a significant role in addressing these challenges. In addition to policy-driven initiatives, funds released by the government towards road

safety have been substantial. In FY27, government's expenditure towards improvement of road safety is estimated to be Rs. 400.0 crores as compared to Rs. 213.6 crores in FY23.

Table 8: Expenditure towards Research, Training, Studies and Other Road Safety Schemes (Rs. Crores)

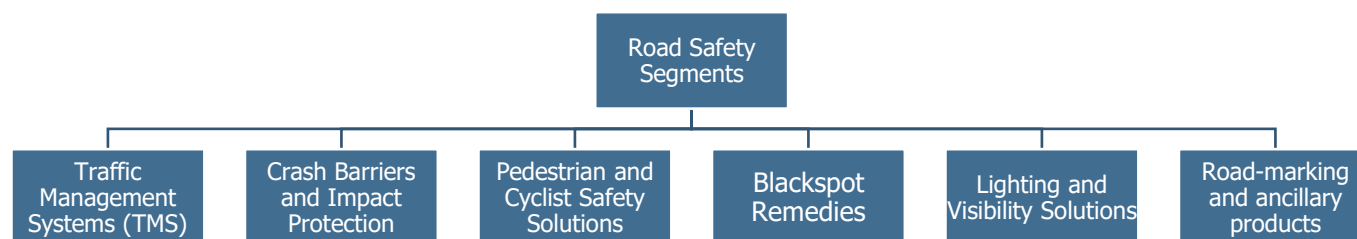


Source: Union Budget: RE-Revised Estimate, BE- Budgeted Estimate

Despite these advancements, the industry faces several challenges. Poor road conditions, inadequate infrastructure maintenance, weak enforcement of traffic laws, and limited awareness among road users continue to hinder progress. Funding constraints also pose a significant barrier to the widespread implementation of road safety technologies and infrastructure projects. However, the outlook for the road safety industry in India remains promising. With ongoing government initiatives such as the National Road Safety Policy, Bharat NCAP (New Car Assessment Program) for vehicle safety ratings, and the Vision Zero initiative, India is expected to see significant improvements in road safety.

3.2 Road Safety Segments

The road safety industry in India encompasses several key segments, including traffic management systems, road safety infrastructure solutions such as Crash barriers, Pedestrian safety solutions, Road marking and others.



3.2.1 Traffic Management Systems

Traffic management systems (TMS) are central to road safety in India, easing congestion, improving mobility, and strengthening enforcement. Key elements include adaptive traffic signals (ATCS) that use sensors and analytics to adjust timings in real time; automated enforcement—speed, red-light, and ANPR—mandated under the Motor Vehicles (Amendment) Act, 2019; and surveillance through CCTV and drones with video analytics for incident detection and congestion control. Under the InTranSE-II programme, ITS integrates GPS, vehicle tracking, and traffic data to optimise corridor operations, with MoRTH driving deployment on highways and urban roads.

Road markings are moving to performance-based specs (IRC/MoRTH) so cameras in ATCS/ANPR and vehicle ADAS (Advanced Driver Assistance Systems) can read lanes in day, night, and rain. They use higher retro-reflectivity and luminance, standard line widths/patterns, and raised (ribbed) edge lines and wet-night materials to stay visible through water film. Durable systems (thermoplastic, cold-applied plastics, pre-formed tapes) retain brightness and sharp edges longer, and solar LED studs add guidance at high-risk locations.

NHAI is rolling out ATMS on major corridors (e.g., Delhi–Meerut, Trans-Haryana), including video incident detection, live camera feeds, and API-based e-Challan integration (framework updated in October 2023). As investment grows, 5G, IoT, and cloud analytics will deepen real-time control and connected-vehicle use cases, supporting safer and smoother travel.

3.2.2 Crash Barriers and Impact Protection

Crash barriers and impact protection systems are designed to minimize the severity of accidents and enhance occupant safety on highways and urban roads. With India experiencing a high number of road crash fatalities (9.4% y-o-y growth in 2022) due to vehicle collisions, the deployment of advanced crash barriers has gained significant importance. These barriers, including W-beam and Thrie-beam crash barriers, concrete barriers, and wire rope safety barriers, are strategically installed along highways, bridges, and accident-prone zones to prevent vehicles from veering off the road or colliding with oncoming traffic. The MoRTH has mandated the installation of crash barriers on national and state highways, focusing on high-risk corridors to mitigate crash impacts. Additionally, impact protection devices such as crash attenuators, end terminals, and energy-absorbing barriers are increasingly being integrated into road design to reduce the force of collisions and enhance vehicle deceleration.

Recognizing the importance of standardized safety infrastructure, the NHAI has issued strict guidelines to ensure the proper installation and quality of metal beam crash barriers (MBCBs). As per NHAI's Policy Circular No. 10.2.40/2024, contractors and concessionaires must adhere to approved technical specifications, including material grade, thickness, post spacing, and fastening components such as bolts and nuts. Additionally, all MBCBs must now feature a QR code, allowing engineers and project officials to access installation guidelines and standard operating procedures directly at the site. These measures aim to improve quality control, ensure compliance with global safety standards, and enhance the effectiveness of crash barriers in preventing fatalities.

Recent advancements in materials, including high-strength steel and reinforced concrete, have increased the durability and effectiveness of these safety installations. Government initiatives, such as the mandatory Road Safety Audits (RSAs) and the rectification of black spots, further highlight the role of crash barriers in reducing fatalities. The growing investment in road infrastructure projects, including expressways and economic corridors, is expected to drive demand for crash barriers, with increasing adoption of international safety standards such as EN 1317 and MASH (Manual for Assessing Safety Hardware) compliance. As India progresses toward achieving Vision Zero—a strategic goal to eliminate road accident fatalities—enhanced impact protection measures and stricter enforcement of barrier installations will play a pivotal role in strengthening the country's road safety ecosystem.

3.2.3 Pedestrian and Cyclist Safety Solutions

Pedestrian and cyclist safety solutions are aimed at reducing fatalities and enhancing mobility for vulnerable road users. With pedestrians and cyclists accounting for a significant share of road accident deaths—19.50% and 2.90%, respectively, in 2022—there is a growing focus on improving infrastructure to ensure their protection. The key safety measures include roadside fencing, pedestrian barriers, designated bicycle lanes, and pedestrian-friendly urban planning initiatives. The MoRTH and local urban development authorities have been implementing pedestrian-

exclusive zones, foot overbridges, and signalized crosswalks in high-traffic areas to prevent accidents. Roadside fencing and pedestrian barriers are being installed along highways and arterial roads to prevent jaywalking and unauthorized road crossings, to address pedestrian-related accidents. Additionally, dedicated bicycle lanes are being developed in smart cities under the National Urban Transport Policy (NUTP) to promote non-motorized transport and sustainable urban mobility.

Additionally, the Indian Roads Congress (IRC) has also set guidelines for the implementation of pedestrian facilities, including wider sidewalks, tactile paving for visually impaired pedestrians, and improved lighting at crossings to enhance safety. Furthermore, urban local bodies are adopting global best practices, such as complete streets and shared mobility infrastructure, to facilitate safer pedestrian and cyclist movement. As India moves toward sustainable urban development, increased investments in pedestrian and cyclist safety solutions, stricter enforcement of traffic laws, and public awareness campaigns are expected to play a vital role in reducing road fatalities and improving overall road safety for non-motorized users.

3.2.4 Blackspot Remedies

The Government of India has accorded priority to the identification and rectification of accident blackspots on National Highways. Blackspots are identified based on accident data, particularly locations witnessing repeated fatalities and grievous injuries. As of March 2025, 13,795 blackspots had been identified on National Highways, of which permanent rectification had been completed at 5,036 locations. Short-term interventions include improved road markings and signage, crash barriers, road studs, delineators, rumble strips, closure of unauthorised median openings and other traffic-calming measures.

For permanent rectification, MoRTH and NHAI undertake engineering interventions such as improvement in road geometry, junction redesign, carriageway widening, service roads, flyovers, underpasses and foot overbridges, depending on site-specific requirements. The Government has also integrated blackspot monitoring with the e-DAR platform and issued guidelines for advance action on accident-prone locations reported through the system.

3.2.5 Lighting and Visibility Solutions

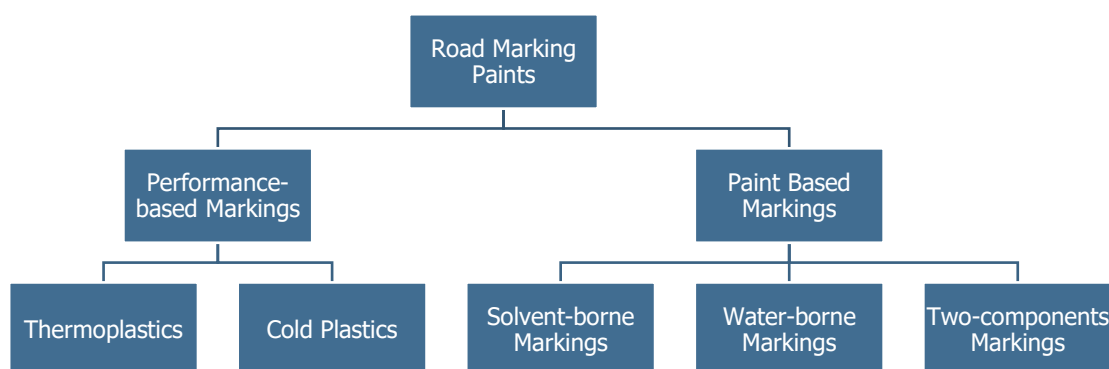
Lighting and visibility solutions enhances road safety in India by improving night time visibility, reducing accident risks, and ensuring safer road conditions for all users. Poorly lit roads, inadequate street lighting, and limited visibility during adverse weather conditions contribute significantly to road accidents, especially on highways and rural roads. To address these challenges, the MoRTH and local authorities are implementing advanced lighting solutions, including high-mast LED streetlights, solar-powered lighting systems, and retroreflective signage to enhance visibility at accident-prone locations. The adoption of LED-based lighting solutions has gained traction due to their energy efficiency, long lifespan, and ability to provide uniform illumination on roads, highways, and intersections.

In addition to street lighting, the installation of retroreflective road markings, cat's eye reflectors, and illuminated signboards has become mandatory in many regions to improve night time driving conditions. High-visibility pedestrian crossings, especially near schools and high-footfall areas, are being integrated with luminous paint and LED-based warning signals to enhance safety. The Indian Roads Congress (IRC) has established guidelines for proper street lighting design, ensuring adequate lux levels and uniformity for different categories of roads. Smart lighting systems, equipped with IoT sensors and automated dimming controls, are being piloted in select urban areas to enhance energy efficiency while maintaining optimal road visibility.

With India's growing focus on road safety and infrastructure modernization, investments in lighting and visibility solutions are expected to increase. State and national highway development projects now include provisions for continuous lighting, particularly in tunnels, underpasses, and accident-prone zones. The integration of smart lighting technologies, supported by government initiatives such as the Smart Cities Mission and the National Highway Development Programme, is expected to significantly improve night-time road safety, reduce accident rates, and strengthen the overall safety of India's transportation network.

3.2.6 Road-marking and ancillary products

Road-marking and ancillary products are playing a crucial role in guiding motorists, enhancing visibility, and preventing accidents. With the rapid expansion of highways, urban roads, and expressways, the demand for high-performance road-marking solutions has increased significantly. Thermoplastic and cold plastic road markings are widely used due to their durability, reflectivity, and resistance to wear, especially in high-traffic areas. These markings, combined with glass beads and retroreflective coatings, improve night-time visibility and ensure lane discipline.



Authorities are installing ancillary safety products like road studs, speed breakers, and rumble strips beside road markings which can regulate vehicle speed and warn the drivers when in critical zones. Road studs including solar-powered models act well for lane visibility in low-light conditions especially on highways and accident-prone zones and against background noise. Rumble markings offer tactile warnings to drivers when approaching at cross points with pedestrians or shaper curved terrains. Highly advanced materials, such as Anti-Skid Pavement Systems (ABPS) and protective coatings have been increased for maximum grip on roads and reduced skidding risks in monsoon conditions.

The Indian Roads Congress (IRC) guidelines on thermoplastic, primer and reflective road paints give a national dimension to road safety measures across the country. With smart city development and the expansion of highways under the Bharatmala and National Highway Development Programme, road-marking technology is going to draw investments from other quarters. As awareness and enforcement improve with road safety, the demand for more innovative and long-lasting road markings is expected to increase, creating a better transportation network in India, safer and sharper.

Building on these national standards and corridor programs, a key on-ground priority is blackspot rectification, where high-performance markings and targeted civil works are used to treat the most crash-prone locations. Blackspot rectification focuses on short road sections with a history of frequent or severe crashes, identified through crash data analysis and road safety audits. Remedies typically include junction redesign, channelisation, speed calming, guardrails, improved lighting and drainage, and high-visibility markings and signage to guide drivers. Follow-up monitoring and periodic re-marking help sustain lower speeds and safer manoeuvres over time.

4 Road-marking Paint Industry

Road markings are essential tools applied to road surfaces to guide and inform drivers and pedestrians about lane divisions, turning regulations, pedestrian crossings, and other critical traffic rules. They may be mechanical, non-mechanical, or temporary. Furthermore, road markings can also be used to portray traffic lanes, provide important information, and even serve as noise generators to alert or wake up drivers when installed on road shoulders.

Thermoplastic road marking is one of the most common types of road marking as it is cost-effective in the long run. Thermoplastic coatings are generally homogeneous dry mixes of binder resins, plasticizers, glass beads, pigments, and fillers that are applied using specially designed vehicles. Thermoplastic road marking is preferred over paints mainly due to the performance benefits of increased durability, retro-reflectivity, and a lack of VOC solvents.

Road marking systems are expected to be enhanced driven by technological advancements focusing on enhancing reflectivity, increasing durability, and cost-effective installation. Going forward, the global road-marking paint market is expected to grow significantly, driven by increasing infrastructure development and the rising emphasis on road safety.

4.1 Global Road Marking Paint Industry

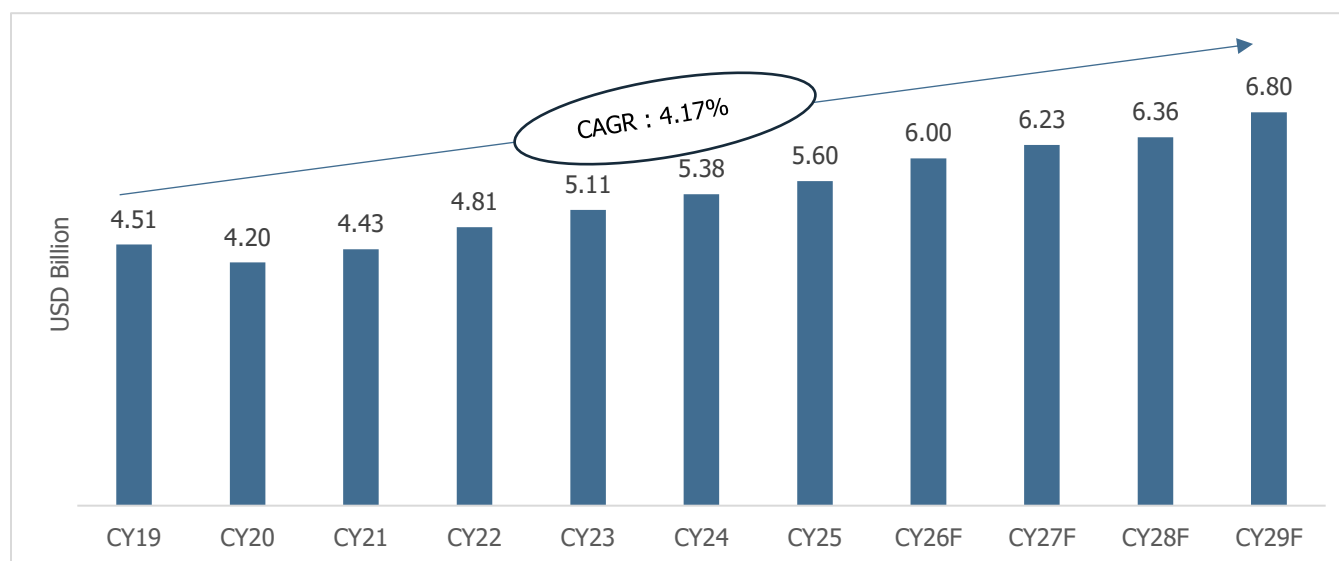
The road marking materials sector is undergoing a major transformation, driven by global infrastructure modernization efforts and advancements in transportation technologies. The industry is witnessing a shift towards innovative road safety materials that comply with environmental guidelines and offer enhanced durability, improved visibility in challenging weather conditions, and better retro reflectivity.

Globally, the road marking industry is rapidly moving toward automation, precision and sustainability. High-output self-propelled machines, automated guidance systems and advanced application technologies are becoming the norm. On the materials side, emphasis is being placed on high quality thermoplastic formulations, cold-applied plastics and markings designed to integrate with autonomous vehicle navigation systems through enhanced retro-reflectivity

Various countries are evaluating their existing road marking standards, as adoption of autonomous vehicles and advanced driver assistance systems (ADAS) has prompted a need for enhanced road marking paint visibility and durability. This shift is noticeable in the United States-country with the largest road network in the world. As their roads require continuous maintenance and improvements in road markings to accommodate traditional and emerging vehicle technologies.

In Australia, industry bodies such as the Traffic Management Association of Australia (TMAA) support improvements in traffic management practices, road-user safety and the adoption of new technologies across the sector. Such initiatives are expected to encourage greater focus on the quality, performance and visibility of road markings as transport systems become increasingly technology-enabled.

Furthermore, as more economies focus on environmental sustainability, the road marking materials manufactures globally are also prioritizing eco-friendly formulations and adherence to stringent regulations. Regions with rigorous environmental standards are moving towards water-based paints and materials, that have relatively lower volatile organic compound (VOC) emissions.

Chart 13: Global Road-Marking Paint Market Size

Source: Maia Research, CareEdge Research

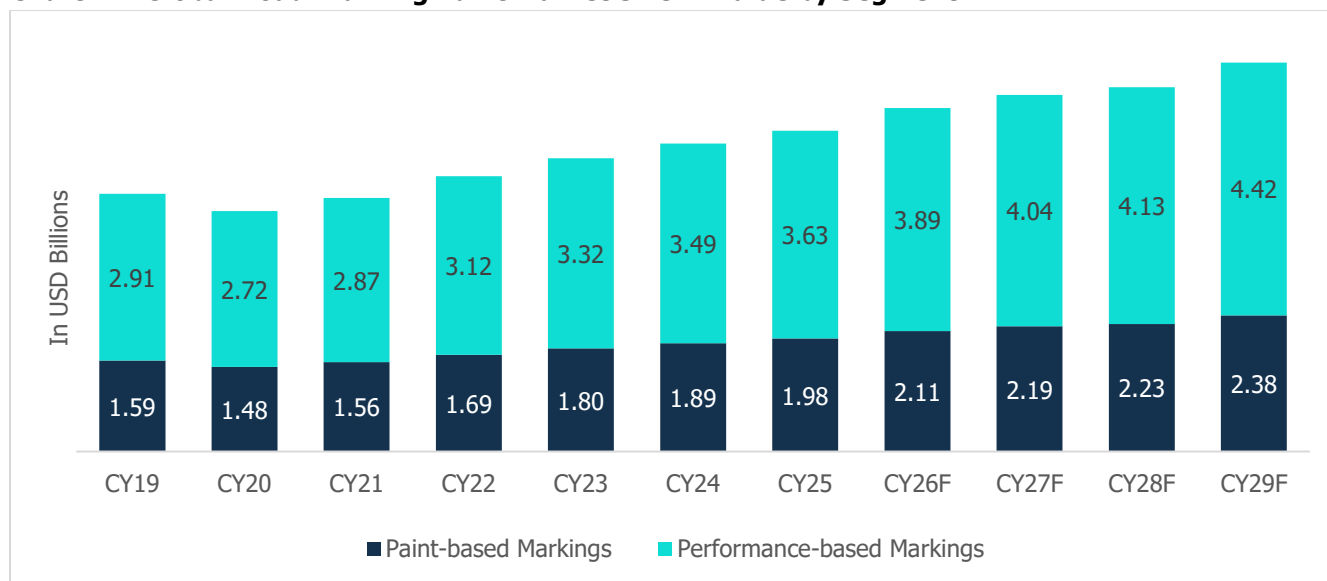
The Road Marking Industry has experienced continuous growth, except in CY20, when the COVID-19 lockdowns imposed worldwide caused significant delays in various global construction projects. An example of this is the delay in the construction of the Silk Route, a major investment project in China. From CY19 to CY25, the market has been growing at a CAGR of 3.72%, and it is projected to expand at a CAGR of 4.85% from CY25 to CY29, reaching a total value of over USD 6.80 billion. Key drivers for this market growth include increased investments in road safety, as well as new infrastructure and road projects in emerging economies, which are pivotal in fuelling the market's expansion.

4.1.1 Global Market size of Road-marking Paint industry – By Segment

The Road Marking Paints are divided into two segments i.e. Paint-based markings and Performance-based markings.

Paint-based markings are created using either water-based or solvent-based paints. These paints are applied to roads to form lines and symbols that help guide traffic and improve safety. Water-based paints are eco-friendly, dry quickly, and have little odour, while solvent-based paints are more durable and adhere better, especially in tough weather conditions.

On the other hand, Performance-based markings are all about long-term effectiveness and durability. These markings are judged by how well they reflect light back to drivers at night, known as retro reflectivity. They often use advanced materials like thermoplastics or epoxy, which offer better visibility and last longer than traditional paint.

Chart 14: Global Road-Marking Paint Market Size in Value by Segment

Source: Maia Research, CareEdge Research

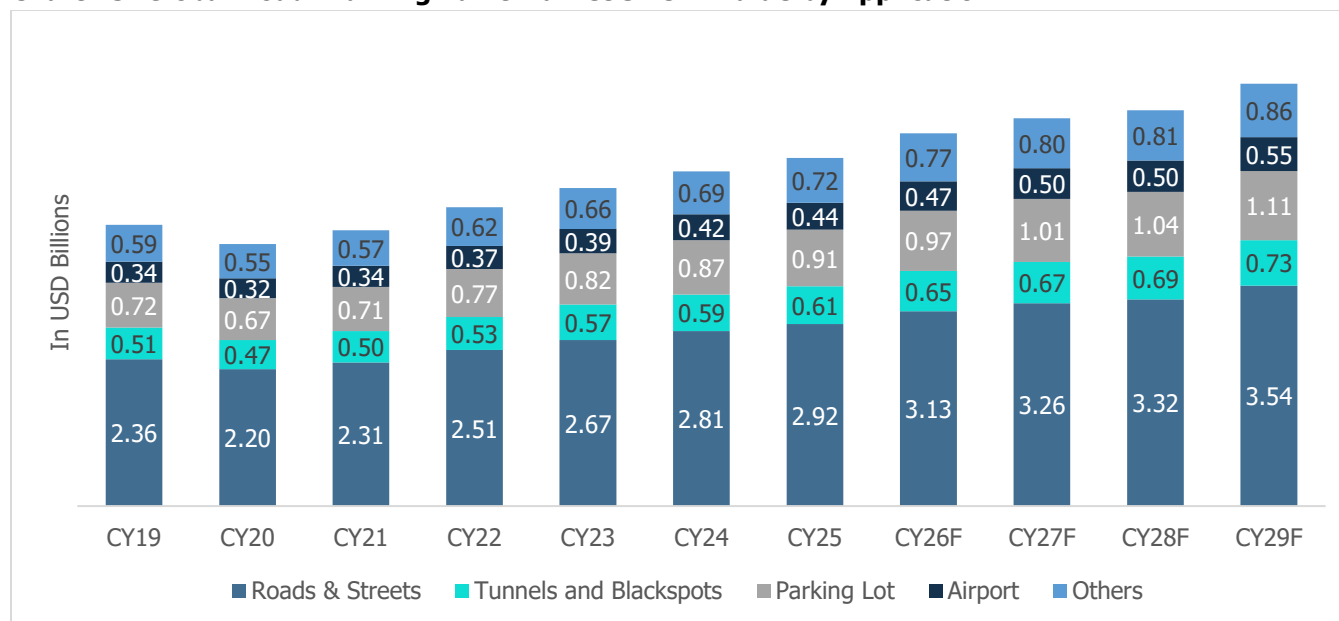
Paint Based Markings: Paint-based markings, which had a CAGR of 3.68% from CY19 to CY25, are projected to grow at a higher rate of 4.78% from CY25 to CY29, reaching USD 2.38 billion by the end of CY29.

Performance-based markings: The segment have seen a growth rate of 3.75% from CY19 to CY25, which is expected to increase by a 5.03% from CY25 to CY29, resulting in a market value of USD 4.42 billion by CY29.

4.1.2 Global Market size of Road-marking Paint industry – By Application

The global road-marking paint market is witnessing steady growth, driven by its diverse applications across various sectors. Key applications include roads and streets, parking lots, airports, and other areas requiring clear and durable markings for safety and navigation.

The rise of airports and the expansion of road networks in cities are significantly impacting the global road-marking paint market. As urbanization accelerates, there is a growing need for well-marked roads and efficient traffic management systems to ensure safety and smooth transportation. This has led to increased demand for road-marking paints, which are essential for delineating lanes, pedestrian crossings, and other traffic-related instructions.

Chart 15: Global Road-marking Paint Market Size in Value by Application

Source: Maia Research, CareEdge Research

Road and Street: The global road-marking paint market has experienced consistent growth from CY19 to CY29, fuelled by rising infrastructure development and urbanization trends. The road and street segment, which was valued at USD 2.36 billion in CY19, has grown to USD 2.92 billion by CY25, reflecting a CAGR of 3.63%. By CY29, this segment is expected to reach USD 3.54 billion, with an accelerated CAGR of 4.93%. This expansion is primarily driven by the continuous development and maintenance of global road networks.

Parking Lot: The parking lot segment, which was valued at USD 0.72 billion in CY19, increased to USD 0.91 billion by CY25, at a CAGR of 3.99%. This segment is expected to reach USD 1.11 billion by CY29, supported by the rise in commercial and residential construction projects.

Airport: The airport segment is also showing promising growth, driven by the increasing number of airports and expansions of existing ones. It has grown from USD 0.44 billion in CY25 to USD 0.55 billion by CY29 with CAGR of 5.81% reflecting highest growth among the above segments.

Tunnels and Blackspots: The tunnel and blackspot category, grew from USD 0.51 billion in CY19 to USD 0.61 billion in CY25, reflecting a CAGR of 2.94%. This segment is anticipated to reach USD 0.73 billion by CY29.

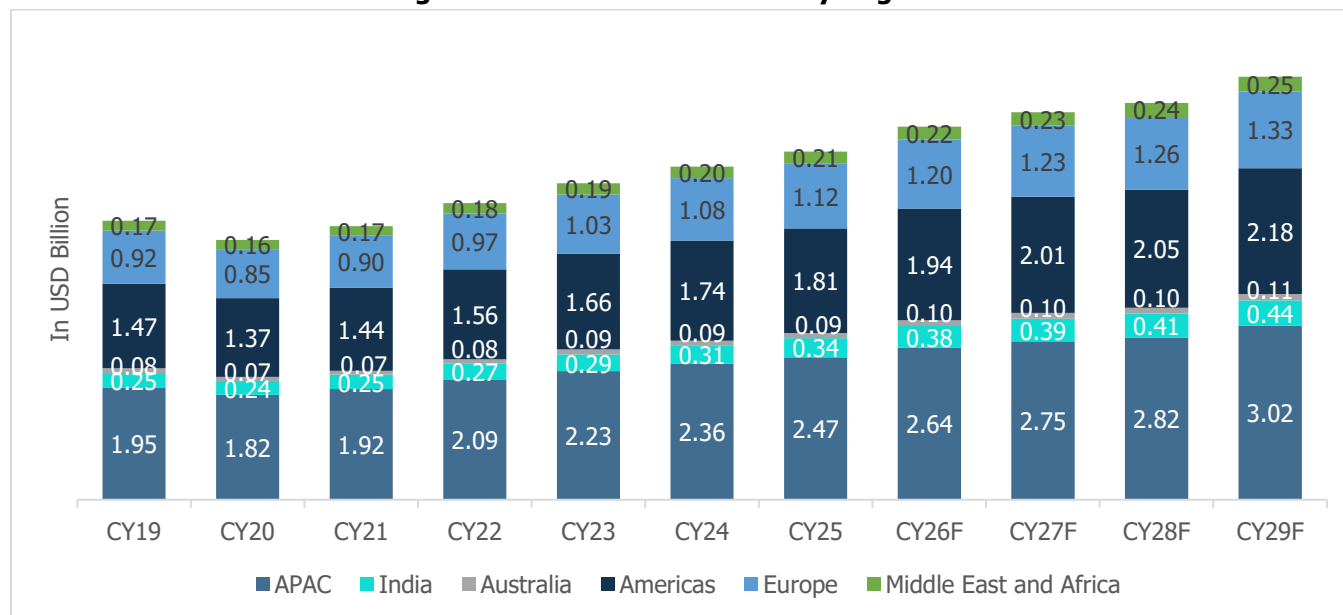
Others: The "Others" category that includes industrial and factory areas, ports and logistics facilities, sports and recreational facilities, grew from USD 0.59 billion in CY19 to USD 0.72 billion in CY25, reflecting a CAGR of 3.33%. This segment is anticipated to reach USD 0.86 billion by CY29.

4.1.3 Global Market size of Road-marking Paint industry – By Region

The global road-marking paint market is growing steadily, with each region showing unique trends. In the Asia-Pacific region, including Australia, rapid urbanization and extensive infrastructure projects are driving demand. Countries like China and India are investing heavily in road construction and maintenance, while Australia focuses on improving its road networks and safety measures. North America, led by the U.S. and Canada, emphasizes road safety and advanced marking technologies, while South American countries like Brazil work on enhancing their road

networks. Europe stands out with its strict regulatory standards and strong focus on road safety. Countries such as Germany, France, and the UK are investing in durable and eco-friendly road-marking solutions. Meanwhile, the Middle East and Africa are experiencing moderate growth due to increasing investments in road infrastructure and urban development. The UAE and Saudi Arabia are expanding their road networks to support economic growth, and Africa is focusing on improving road connectivity and safety measures.

Chart 16: Global Road-marking Paint Market Size in Value by Region



Source: Maia Research, CareEdge Research, Note: APAC figures include India and Australia

APAC: As of CY25 APAC is the biggest market and is expected to be the same by CY29. The market grew by the CAGR of 4.01% between CY19 – CY25 and is expected to grow at CAGR of 5.17% between CY25-CY29. The growth is due to rapid urbanization, extensive infrastructure development, and increasing road safety measures.

America: America is the second largest market for road marking. The region is projected to grow at a CAGR of 4.76% from CY25 to CY29, reaching USD 2.18 billion. The demand for road-marking paints in the Americas is mainly driven by the need to maintain road infrastructure, improve traffic safety, and enhance road visibility in regions with harsh weather conditions.

Europe: The European road-marking paint market is set to grow steadily, 4.38% from CY25 to CY29. This growth is fuelled by strict regulations aimed at boosting road safety, enhancing infrastructure, and promoting eco-friendly solutions. Germany, France, and the UK are at the forefront of this demand, leading the charge towards safer and greener roads.

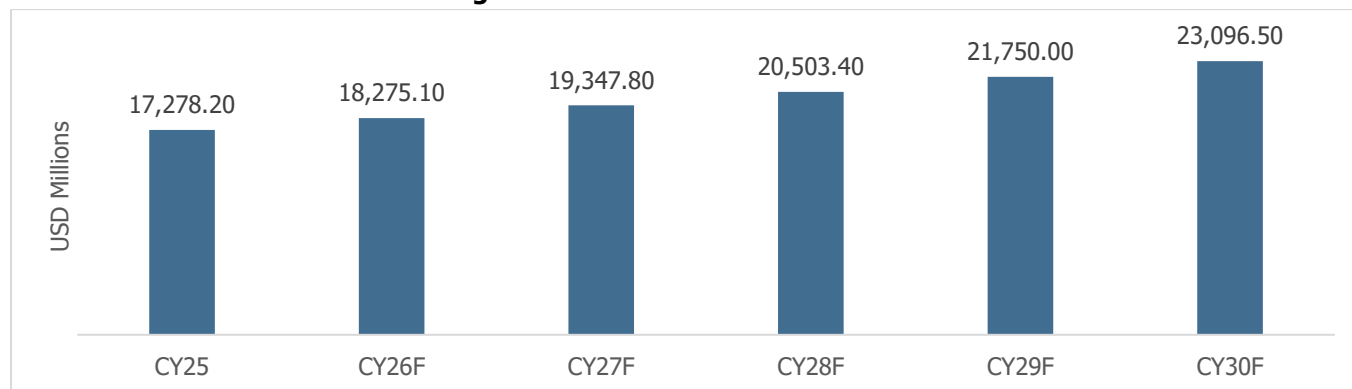
Middle East and Africa (MEA): The MEA region, although smaller in terms of market share, is expected to experience healthy growth, is expected to reach USD 0.25 billion by CY29 at CAGR of 4.41% from CY25. Growth in this region is driven by increasing investments in infrastructure projects, particularly in countries like Saudi Arabia, the UAE, and South Africa. These countries are focusing on modernizing their road infrastructure and improving traffic safety standards.

4.1.4 Global Protective Coatings Market

The global protective coatings market is supported by increasing industrial activity, urbanisation and the need to improve the service life of infrastructure and industrial assets. Sectors such as oil and gas, marine, aerospace and automotive use protective coatings to reduce corrosion, surface degradation and associated maintenance costs.

The global protective coatings market was valued at USD 17,278.2 million in CY25 and is estimated to grow to USD 23,096.5 million in CY30. This will create an incremental growth opportunity worth USD 5,818.3 million between CY25 and CY30, which translates to 33.67% of the market size in CY25.

Chart 17: Global Protective Coatings Market

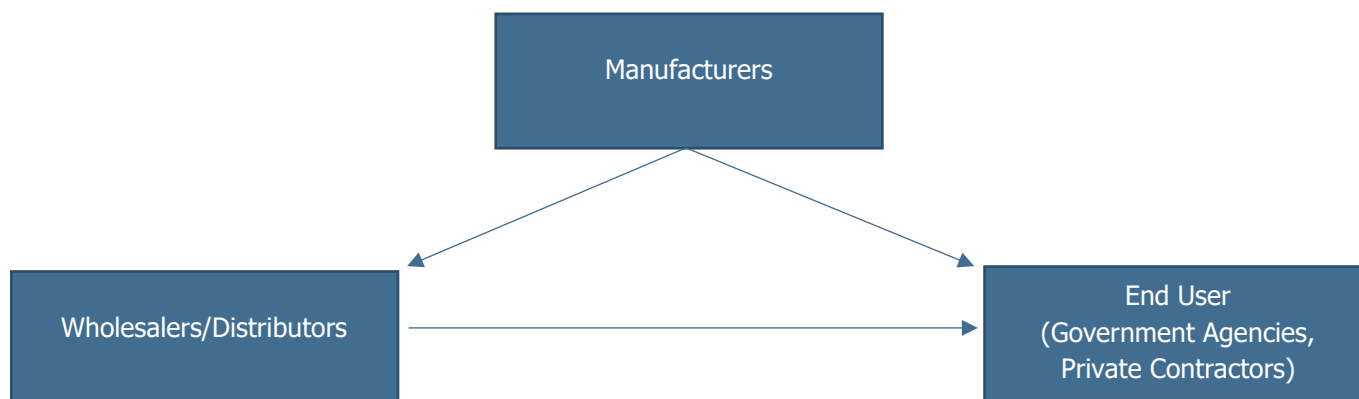


Source: EMIS, CareEdge Research

4.1.5 Value Chain and Distribution Analysis

The road marking industry involves a comprehensive value chain and distribution process. It begins with raw material suppliers who provide essential components such as pigments for colour and visibility, binders for adhesion, solvents for application, and additives to enhance properties like drying time, durability, and reflectivity. Manufacturers then combine these raw materials to produce road-marking paint, ensuring quality control through rigorous testing to meet safety and performance standards. The distribution process includes wholesalers who purchase in bulk from manufacturers and sell to retailers or contractors, and retailers who cater to end-users such as government agencies and private contractors.

Figure 1: Value Chain and Distribution Analysis of Road-marking Paint Industry



End-users, including government agencies and private contractors, utilize these products for public road maintenance, new road projects, parking lots, industrial sites, and commercial properties. The distribution process can occur through direct sales, where manufacturers sell directly to large end-users, ensuring a streamlined supply chain, or through indirect sales via wholesalers and retailers, which allows for broader market coverage and accessibility.

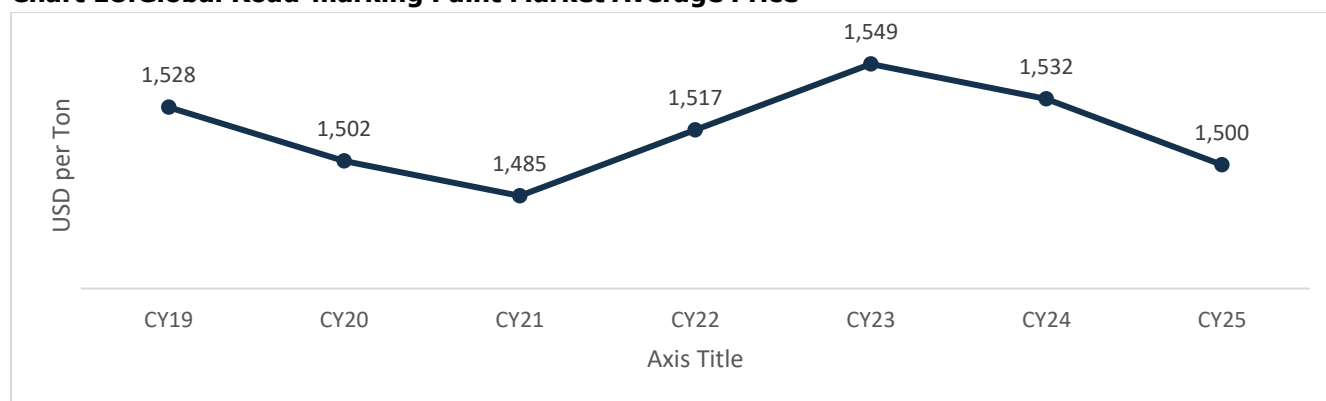
Industry practices often involve establishing networks of channel partners across various regions to handle domestic product sales. These partners maintain relationships with local road contractors and supply materials based on demand. Regular seminars and conferences are conducted to keep channel partners informed about recent developments in the road marking industry and products, helping to strengthen relationships and ensure up-to-date knowledge transfer.

For marketing of contracting services, the companies generally have a dedicated team headed by a project manager who keeps track of new orders being awarded and follows up with the road developers for the procurement of marking contracts.

4.1.6 Average Global Price of road-marking paint

The price of road-marking paint is influenced by several factors. Raw material costs, including pigments, binders, and additives, play a significant role, as higher quality materials can drive up prices. The type of paint also affects cost; for instance, thermoplastic paints are generally more expensive due to their durability and application process, while water-based paints are more cost-effective but may require more frequent reapplication. Manufacturing processes, including quality control and advanced technology, can increase production costs. Additionally, the method of application, which may require specialized equipment and skilled labour, influences the overall price. Market demands and competition also impact prices, as fluctuations in supply and demand and the presence of multiple suppliers can drive prices up or down. Finally, regulatory standards and environmental regulations add to costs, particularly for eco-friendly paints that comply with stringent requirements.

Chart 18: Global Road-marking Paint Market Average Price



Source: Maia Research, CareEdge Research

The global road-marking paint market has experienced fluctuations in average prices over the years. In CY19, the average price was USD 1,528 per ton, but it saw a decline in CY20 and CY21, dropping to USD 1,502 and USD 1,485 per ton, respectively. This decline can be attributed to the economic impact of the COVID-19 pandemic, which disrupted supply chains and reduced demand for road-marking paints due to delays in infrastructure projects.

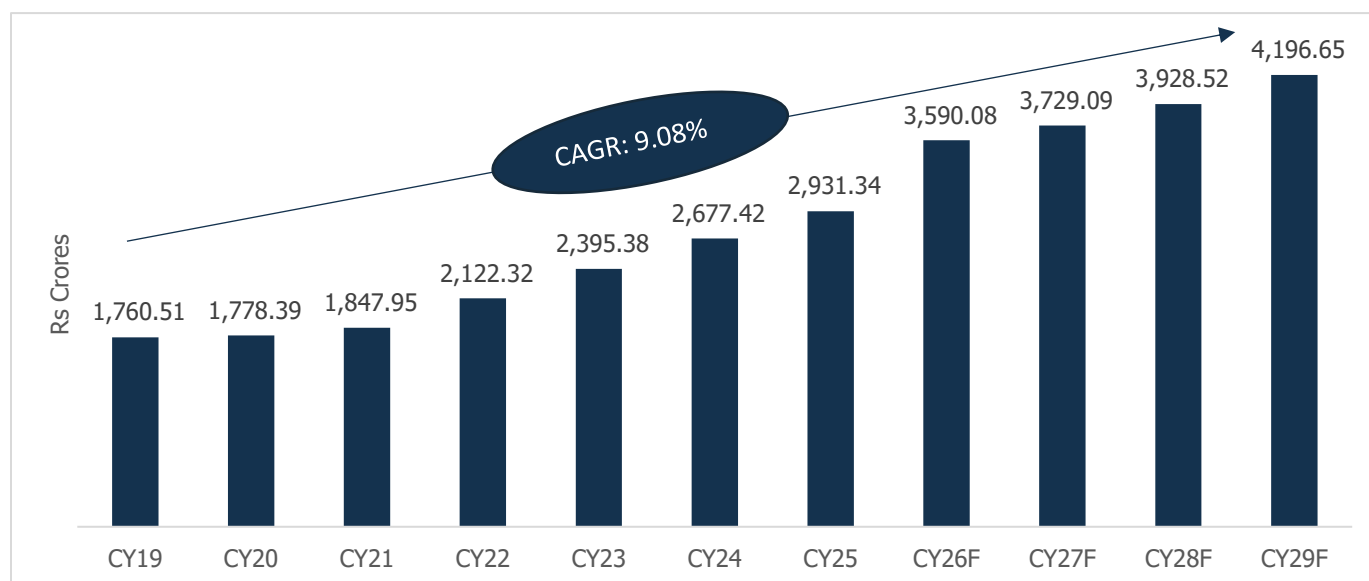
Prices subsequently recovered to USD 1,517 per ton in CY22 and reached USD 1,549 per ton in CY23 as infrastructure activity and demand improved. Thereafter, average prices moderated to USD 1,532 per ton in CY24 and further to USD 1,500 per ton in CY25. Overall, average prices remained broadly range-bound over CY19-CY25, with periodic movements reflecting changes in demand conditions, raw material costs and broader market dynamics.

4.2 India Market size of Road-marking Paint industry

The economic development of the country and the consequent surge in the demand for transport services, and also the strategic needs of the country necessitated expansion as well as improvement of the road network. The Indian Roadways play a crucial role in connecting the different parts of India. Over the years after independence there has been an extensive development of the network of roads across the length and breadth of India.

Government initiatives like Bharatmala and Pradhan Mantri Gram Sadak Yojana are pivotal in driving growth within the sector. These programs aim to improve road infrastructure across India, thereby boosting the demand for quality road markings.

Chart 19: Indian Road-Marking Paint Market Size

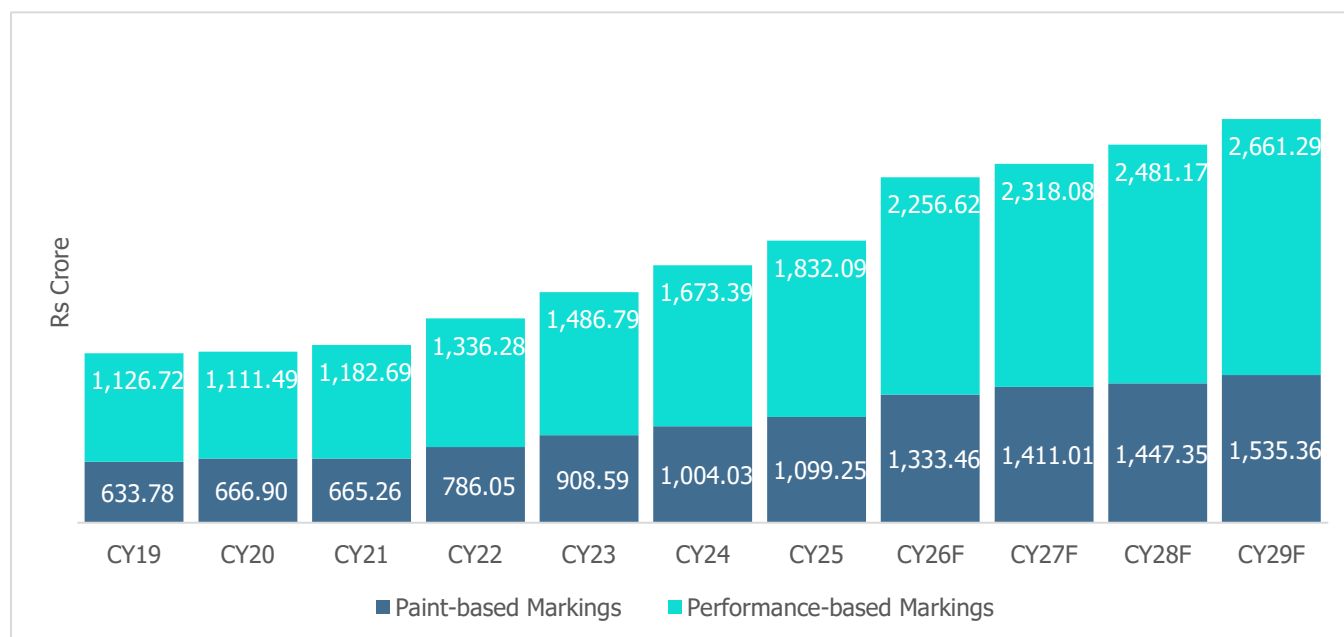


Source: Maia Research, CareEdge Research

The Indian road-marking paint market has experienced steady growth over the past few years. From CY19 to CY25, the market value increased from Rs.1,760.5 crore to Rs.2,931.3 crore reflecting a CAGR of 8.87% and is expected grow at 9.39% CAGR from CY25 to CY29. This growth is driven by infrastructure development, increasing awareness of road safety, and various government initiatives.

4.2.1 Indian Market size of Road-marking Paint industry – By Segment

Chart 20: India Road-marking Paint Market Size in Value by Segment



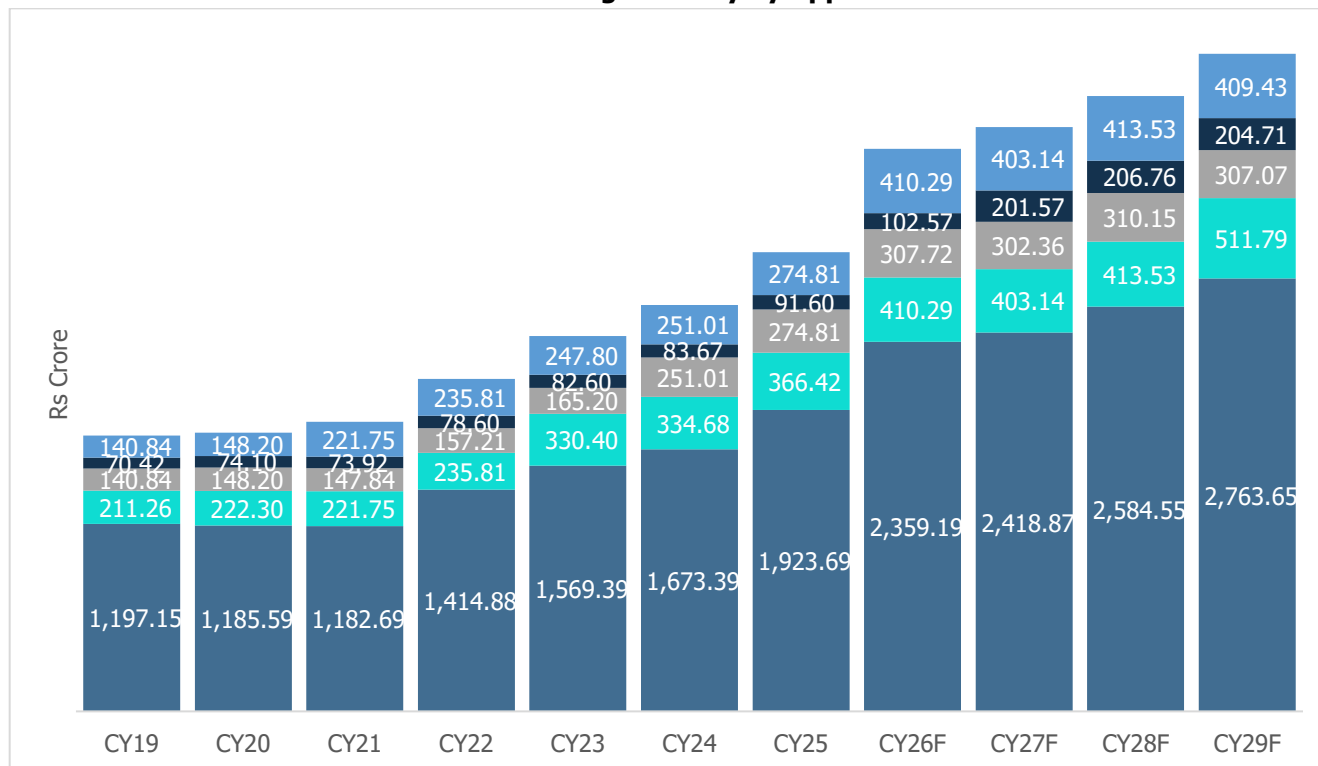
Source: Maia Research, CareEdge Research

Paint Based Markings: In the paint based markings segment, the market has seen a gradual increase, growing from Rs.633.78 crore in CY19 to Rs.1,009.25 crore in CY25, with a CAGR of 9.61% from CY19 to CY25. Growth has been supported by the continued expansion and maintenance of urban and rural road networks, periodic repainting requirements and the relatively lower upfront cost and ease of application of paint-based markings. Their suitability for roads with moderate traffic volumes, municipal roads, parking areas and maintenance works also supports recurring demand. Going forward, the segment is expected to reach Rs.1,535.36 crore by CY29, registering a CAGR of 8.71% from CY25 to CY29, supported by continued road construction, resurfacing and maintenance activities and increasing focus on improving lane visibility and road safety.

Performance Based Markings: The performance based markings segment has also shown similar growth. It increased from Rs.1,126.72 crore in CY19 to Rs.1,832.09 crore in CY25, with a CAGR of 8.44% during the same period. Demand for performance based markings is being driven by the expansion of National Highways, expressways and other high-speed corridors, where greater durability, skid resistance and night time visibility are important performance requirements. Increasing emphasis on road safety, rectification of accident blackspots and the need for markings capable of withstanding higher traffic volumes and adverse weather conditions are also supporting adoption. The segment is projected to grow at a comparatively faster CAGR of 9.78% during CY25-CY29 to reach Rs.2,661.29 crore by CY29, aided by increasing preference for durable, specification driven road marking solutions with lower maintenance frequency and better lifecycle performance.

4.2.2 Indian Market size of Road-marking Paint industry – By Application

Chart 21: Indian Market Size of Road-marking Industry by Application



Source: Maia Research, CareEdge Research

Roads & Streets: This segment remains the largest, growing from Rs.1,923.69 crore in CY25 to Rs.2,763.65 crore in CY29, with a CAGR of 9.48%. The growth is driven by continuous urbanization and the expansion of national highways, which require extensive road marking for safety and traffic management.

Parking Lots: The parking lot segment is set to see steady growth, reaching Rs.307.07 crore by CY29, with a CAGR of 2.81%. This increase is fuelled by the rising number of commercial and residential complexes, which demand well-marked parking spaces for better organization and safety.

Airports: The airport segment is expected to experience the highest growth, increasing from Rs.91.60 in CY25 to Rs.204.71 in CY29, at an impressive CAGR of 22.27%. The surge in air travel and the expansion of airport infrastructure are key factors contributing to this rapid growth, necessitating precise and durable markings for runways and taxiways.

Tunnels and Blackspots: The tunnel and blackspot category, grew from 211.26 crore in CY19 to Rs.366.42 Crore in CY25, reflecting a CAGR of 9.61%. This segment is anticipated to reach Rs.511.79 crore by CY29.

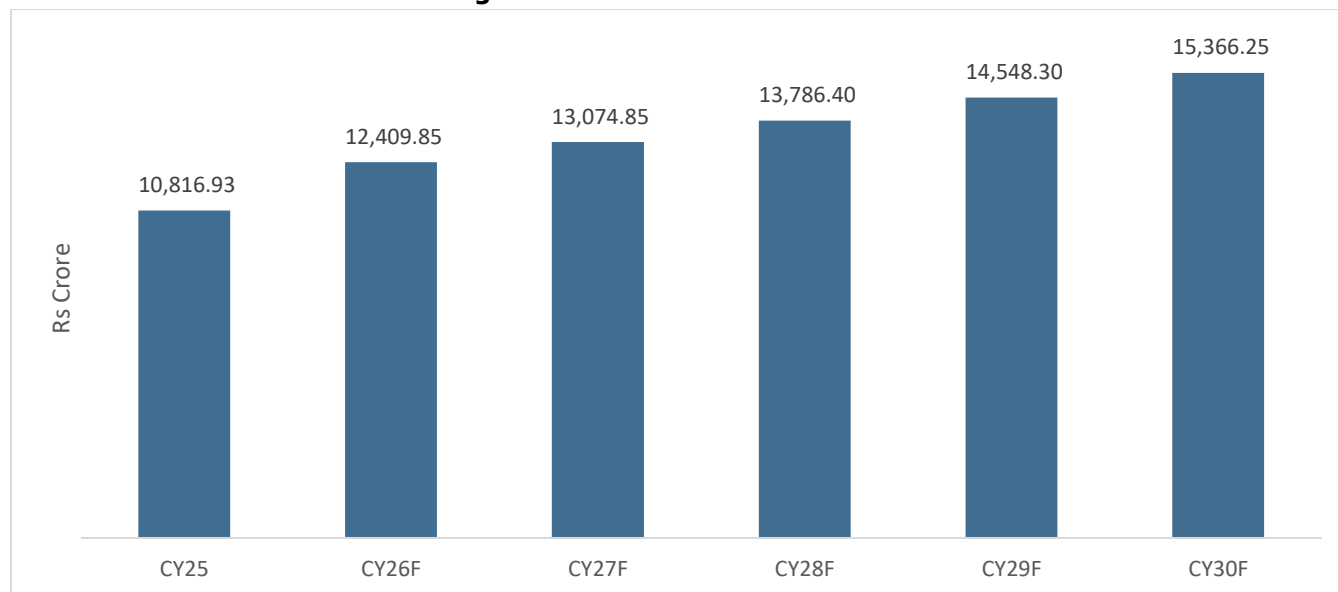
Others: The "Others" category that includes industrial and factory areas, ports and logistics facilities, sports and recreational facilities will continue its steady expansion, growing from Rs.274.81 crore in CY25 to Rs.409.43 crore in CY29, with a CAGR of 10.48%.

4.2.3 Indian Protective Coatings Segment

The Indian protective coatings market is supported by infrastructure development, expansion in domestic manufacturing and investment across transport, energy and industrial sectors. Construction of highways, bridges, urban infrastructure and industrial corridors is driving demand for corrosion-resistant coatings used to protect steel and concrete structures. The energy sector, including thermal power, oil and gas, solar and wind installations, also represents an important end-use segment, while marine infrastructure and shipping support demand for anti-corrosive and antifouling coating systems.

The country contributed 7.18% to the global protective coatings market in CY25. The market is expected to grow from Rs.10,816.93 crore in CY25 to Rs.15,366.25 crore in CY30 at CAGR of 7.27%.

Chart 22: Indian Protective Coatings Market



Source: EMIS, CareEdge Research

4.2.4 Regulations in Road-marking Paint industry

Bureau of Indian Standards:

The Bureau of Indian Standards (BIS) has established specific standards for road marking paints to ensure quality and safety. The primary standard for road marking paints is IS 164: 2023, which outlines the specifications for ready-mixed paint used in road markings.

- **Colours:** White and yellow materials are used for traffic control, while black material is used for painting kerb stones and traffic islands.
- **Lead Restriction:** The material must be tested for lead content in accordance with IS 101 (Part 8/Sec 5), or by Atomic Absorption Spectrometer (AAS) or ICP. The material should not contain lead or its compounds exceeding 90 ppm, calculated as metallic lead.

Toxic Metals: The product should not contain more than 0.10 percent by mass (as metal) of any toxic metals such as cadmium, chromium (VI), and their compounds, when tested by the relevant atomic absorption spectrophotometric methods.

- **ECO-Mark Certification:** For products certified for ECO-Mark, three major ingredients and hazardous chemicals must be marked on the container. The criteria for which the product has been labelled as ECO-Mark should also be marked on the container.
- **Flammability Warning:** Containers, excluding those containing water-based paint, should be marked 'HIGHLY FLAMMABLE LIQUID' in red letters (either printed on the label affixed to the container or lithographed or stencilled thereon with indelible ink) in a type size of not less than 50 mm. Additionally, all containers for storage and transport must comply with the latest issue of Red Tariff and requirements as laid down from time to time by the Chief Inspectorate of Explosives.

Indian Roads Congress (IRC)

The Indian Roads Congress has formulated IRC 35-2015 'Code of Practice for Road Marking' to provide guidance, procedure and recommendation on the type of road markings with details on dimensions including selection, installation and inspections procedure for different road marking materials.

As per para 3.8.2 of IRC 35 'Colour of pavement markings', the colour of pavement marking on concrete surface has been specified as yellow. Generally, white colour of longitudinal marking is used on bituminous surface. Under natural light, the white light reflects the light of most wavelength whereas other colours absorb different wavelength of light energy. The yellow colour may offer slightly better contrast with concrete surface compared to white colour. But the reflectivity of white is better as compared to yellow. Moreover, the importance of reflectivity is more during night time and wet conditions.

In view of better retro reflectivity and to have uniformity, it has been decided with the approval of competent authority that white colour markings shall be used on concrete surface instead of yellow markings as mentioned in para 3.8.2 of IRC35. As such, the colour of pavement marking on bituminous surface and concrete surface shall be as given in A.1 to A.7 of Annexure A of IRC:35-2015 for all National Highway works.

4.2.5 Key Growth Drivers

Developments in Roadways sector:

The Government of India is undertaking a comprehensive overhaul of the country's infrastructure to stimulate economic growth, enhance connectivity, and improve citizens' quality of life. This effort includes modernizing transportation networks, upgrading urban amenities, and expanding digital infrastructure. Key initiatives span the development of highways, railways, airports, waterways, and ropeway systems, all aimed at fostering inclusive and sustainable development nationwide.

India's road infrastructure is undergoing significant transformation through strategic planning and substantial investments. The National Highway (NH) network expanded by around 61%, from 91,287 km in March 2014 to 1,46,572 km in March 2026, reflecting sustained investment in highway development and network expansion across

the country. The length of 4-lane and above National Highways, including access-controlled High-Speed Corridors and expressways, increased by around 2.6 times from 18,371 km in 2014 to 48,568 km by February 2026, reflecting sustained capacity augmentation of the National Highway network. The Government continues to target an acceleration in highway construction, with an aim to reach around 60 km/day over the medium term.

The expansion of highways and expressways has directly increased the need for road-marking paints, particularly reflective paints that can ensure high visibility at night or during adverse weather conditions. Additionally, the increase in high-speed traffic and larger vehicle volumes on highways demands durable, high-quality road markings that can withstand wear and tear. This is encouraging the adoption of thermoplastic and reflective paints for long-lasting and high-performance road markings.

Government Focus on Road Safety:

Road Safety is an integral and indispensable component of every National Highways Project. Road Safety initiatives commence with the inception of Detailed Project report as road safety audit has been made mandatory at all stages i.e. design, construction, operation & maintenance through third party auditors/experts. According to MoRTH's available data, the funds allocated for comprehensive road safety measures range from 2.21% to 15% of the total cost of development projects, depending on the structures involved in the construction of national highways.

High priority is accorded to identification and rectification of blackspots (accidents prone spots) on National Highways. Concerted efforts towards improvement of road safety through engineering measures on National Highways have been made.

A total of **13,795 accident black spots** has been identified on National Highways across India. As of February 2026, short-term rectification measures had been completed at **12,289 black spots**, while long-term rectification measures had been completed at **5,773 black spots**. Further, 3,705 locations were assessed as not requiring long-term intervention. Rectification remains a continuous process, with immediate measures undertaken at newly identified accident-prone locations through the electronic Detailed Accident Report (e-DAR) system. Long-term measures include improvement of road geometry, junction upgrades, spot widening and construction of underpasses and overpasses.

The ongoing identification and rectification of accident-prone locations is expected to create a sustained opportunity for road safety solution providers in India. Beyond major civil works, blackspot mitigation also requires supporting interventions such as road markings, rumble strips, road studs, delineators, signage and other visibility-enhancing measures. As road authorities increasingly focus on preventive safety measures and timely treatment of newly identified blackspots, demand for specialised road-marking and traffic safety products is expected to increase over the coming years.

The Ministry is taking following steps to rectify the black spots:

- The blackspots are being rectified by providing immediate short-term measures such as cautionary road signs and markings, transverse bar markings, rumble strips and solar blinkers etc.
- For long term rectification, measures such as Flyover, Underpasses, Foot over Bridges, Service roads etc. are being provided wherever required.
- Traffic calming measures such as traffic warning signs, delineators, road studs, bar markings, humps at approach roads, etc. are taken at vulnerable sections of National Highways to reduce road accident fatalities.

Emergency/medical facilities for the road accident victims are provided as per the respective contract/concession agreements signed between NHAI and the contractor/concessionaire.

Smart Cities

The Smart Cities Mission was launched on 25 June 2015 by Prime Minister Shri Narendra Modi. It aims to enhance the quality of life in 100 selected cities by providing efficient services, robust infrastructure, and a sustainable environment. Through smart solutions, the mission seeks to promote economic growth, inclusivity, and sustainability by focusing on the social, economic, physical, and institutional pillars of urban development.

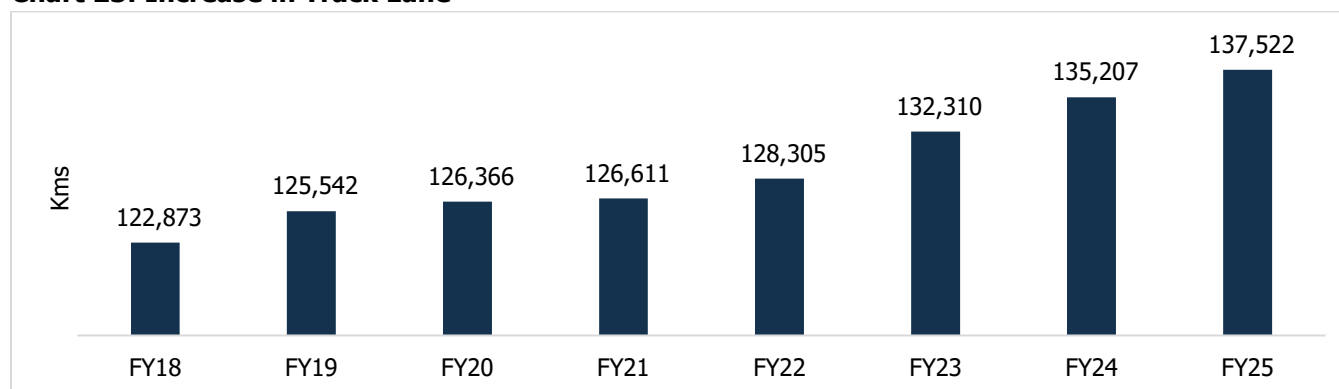
The drive towards smart cities has also created opportunities for infrastructure development, including roads, railways, and commercial centres. The government's measures to simplify land acquisition processes and improved compensation have helped developers overcome challenges and obstacles in development projects. Housing and inclusiveness - expand housing opportunities for all. Under the scheme, more than 8,000 multi-sectoral projects are being developed by these 100 cities, amounting to approximately Rs. 1.6 lakh crore. More than 90% of the total projects (7,244 projects amounting to Rs 1,45,312 crore) have been completed. Each city has developed a diverse set of projects, many of which are unique and being implemented for the first time, thus enhancing the cities' capabilities and experience and achieving broader transformational goals at the city level.

The rise of smart cities is pushing for road-marking paints that are reflective and capable of interacting with sensor systems (e.g., those that detect lane boundaries or vehicle speeds). This has led to greater demand for reflective road-marking paints with high-performance features. Additionally, as smart cities prioritize aesthetics and functionality, there's an increasing trend towards using coloured markings and decorative road paints to enhance the visual appeal and clarity of road signage and markings.

Increase in Railway Tracks and Stations

Indian Railways' total track length increased from 1,35,207 km as of FY24 to 1,37,522 km as of FY25, covering running lines, sidings and yard tracks across all gauges. During FY15-FY26, 36,429 km of new track was commissioned, including new lines, gauge conversion and multi-tracking works, at an average rate of 8.32 km per day compared with 4.2 km per day during FY10-FY14. For FY27, Rs 595.74 billion has been estimated for allotment to track renewals and to construct new lines. The Indian Government is hence focusing on the improvement of the Indian Railway infrastructure and is expected to invest more in the railway's infrastructure in the coming years.

Chart 23: Increase in Track Lane

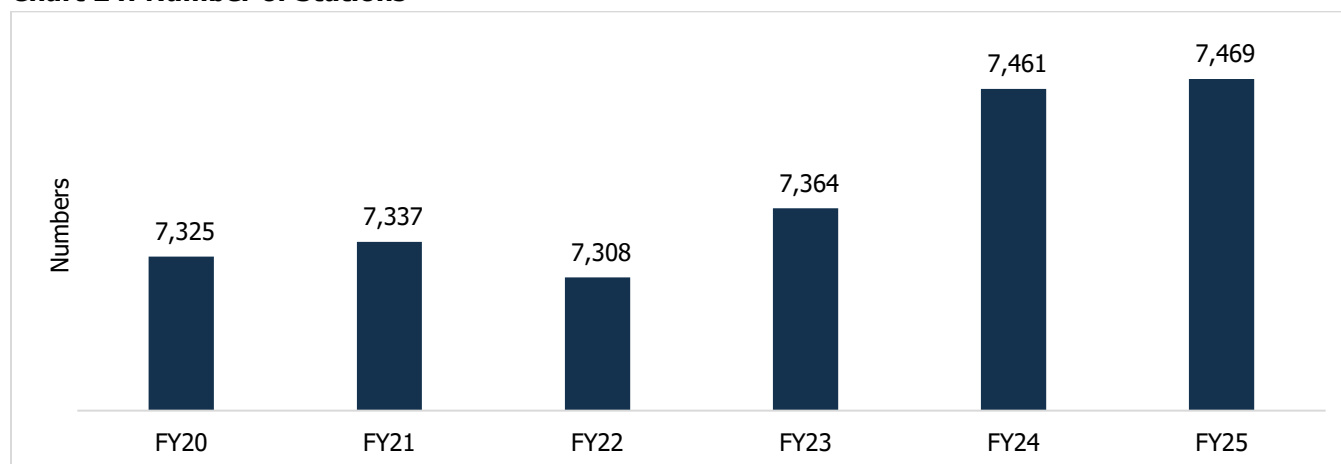


Source: Indian Railway Yearbook

In recent years, there has been a concerted effort to modernize and redevelop the stations under initiatives such as the Amrit Bharat scheme, aiming to enhance passenger amenities and improve overall infrastructure. This modernization effort involves refreshing facilities such as waiting areas, ticketing systems, and sanitation, while also bringing in smart technologies to enhance management and efficiency. These improvements are part of a larger plan to handle the increasing number of passengers, elevate service quality, and help Indian Railways achieve

its ambitious vision of a more reliable and user-friendly transport network. As of FY25, India boasts 7,469 railway stations.

Chart 24: Number of Stations



Source: CMIE, CareEdge Research

There was a dip in numbers in FY22 because of major infrastructure upgrades for which some stations were temporarily ceased to operate or closed to improve efficiency by merging them with other stations.

As the railway sector prioritizes safety, there is an increased demand for high-quality safety signs and markings. This includes the use of durable, highly visible paints for signage at railway crossings, stations, and other critical areas. Additionally, improved railway infrastructure often necessitates better integration with road networks. This includes clear and effective signage to manage traffic around railway crossings and stations, boosting the demand for marking paints.

Expansion in Airport

India's airport expansion is a demand driver for the road-marking paint industry. Each new or upgraded airport requires marked access roads, loops, parking areas and service roads from the start, and these high-traffic zones operate round the clock. Agencies therefore specify fast-curing, durable and high-visibility systems—typically thermoplastic or other long-life materials with reflective beads—to keep lanes clear in day, night and rain. Multi-runway master plans are built in phases, which leads to diversions and new links over time and creates repeat needs for both temporary and permanent markings. On the landside, traffic management and camera-based enforcement around terminals depend on crisp, machine-readable lines, supporting uptake of premium, performance-based products. Cargo precincts, warehousing roads and loading bays add further scope for arrows, chevrons, stop bars and safety colour surfacing. As terminals and runways expand, kerbside redesigns, bus and taxi lanes, and multi-level parking also come up for fresh striping. Feeder corridors to airports are then upgraded as gateway routes, extending demand beyond the airport boundary. Together, these factors translate into steady, multi-year offtake for road-marking paints.

Increase in Parking Spaces

India's build-out of office parks, malls, supermarkets, public venues and stadiums is pushing steady growth in organised parking at sites themselves and through city-led multi-level car parks, creating recurring demand for clear, durable bay lines, arrows, pedestrian zones and safety markings. Smart Cities projects continue to add structured parking in busy commercial districts, reinforcing a shift from informal kerbside parking to marked,

managed facilities. A parallel policy push is shaping how these car parks are designed: MoHUA's amendment to the Model Building Byelaws requires EV-charging provisions in new developments (often expressed as a share of total parking), which in practice leads to separately demarcated EV bays with distinct colours and symbols for wayfinding and enforcement. The Ministry of Power's national guidelines for EV charging further standardise public and semi-public charging layouts, accelerating EV-ready parking in commercial real estate and civic facilities. On the ground, this translates into more special-purpose markings—EV bay boxes, charger approach lanes, no-parking buffer zones, fire and accessibility routes—alongside routine re-marking as tenant mix and traffic patterns change. Marking practice is anchored in Indian standards (IRC:35 for pavement markings; allied urban parking guidance), supporting consistent line widths, symbols and reflectivity across multi-level and surface lots. Taken together, the expansion of destination real estate and the EV-readiness mandate make parking facilities a structural, multi-year growth driver for road-marking paints.

4.2.6 Key Challenges

Quality and Durability Issues:

- India's diverse climate, ranging from humid coastal areas to extreme heat in the north and cold in the Himalayas, significantly impacts the durability of road-marking paints. High temperatures, humidity, and rainfall often cause paints to fade or wear off quickly. Additionally, the inconsistent quality of raw materials used in manufacturing these paints leads to varying performance levels. Poor quality paints may not withstand heavy traffic, weather conditions, or chemical exposure, resulting in frequent reapplications.

Lack of Standardisation:

- There is no uniform standard for road-marking materials, application techniques, and finish quality across different states and municipalities in India. This lack of standardization leads to inconsistencies in the appearance and performance of road lines across the country. Different regions may adopt varying standards, causing confusion and reducing the overall effectiveness of road markings. Inconsistent application practices and the absence of clear guidelines further contribute to this issue.

Environmental Concerns:

- Many conventional road-marking paints contain harmful chemicals like VOCs (Volatile Organic Compounds), which are detrimental to air quality and contribute to environmental pollution. The industry faces increasing pressure to develop eco-friendly, low-VOC alternatives to mitigate these environmental impacts. Additionally, improper disposal of leftover paint or used containers can lead to environmental hazards, especially near water bodies, posing a significant challenge for the industry.

High Production and Maintenance Costs:

- Durable and weather-resistant road-marking paints are often expensive due to the high costs of raw materials such as resins and pigments. These costs drive up production prices, making it challenging for manufacturers to maintain affordability. Furthermore, the maintenance and reapplication of road markings, especially in regions with harsh weather or heavy traffic, add to ongoing costs for government agencies. This financial burden can strain budgets and delay necessary road maintenance projects.

Improper Application Techniques:

- Road marking is a specialized task that requires skilled labour and proper machinery. Inadequate training and outdated equipment can lead to uneven application, poor visibility, and a shorter lifespan of road markings. The need for precise timing and conditions during application, such as specific temperature and humidity levels, can also be challenging to manage. Ensuring high-quality markings requires investment in training and modern equipment to achieve consistent and effective results.

Limited material innovation amid diverse climatic conditions

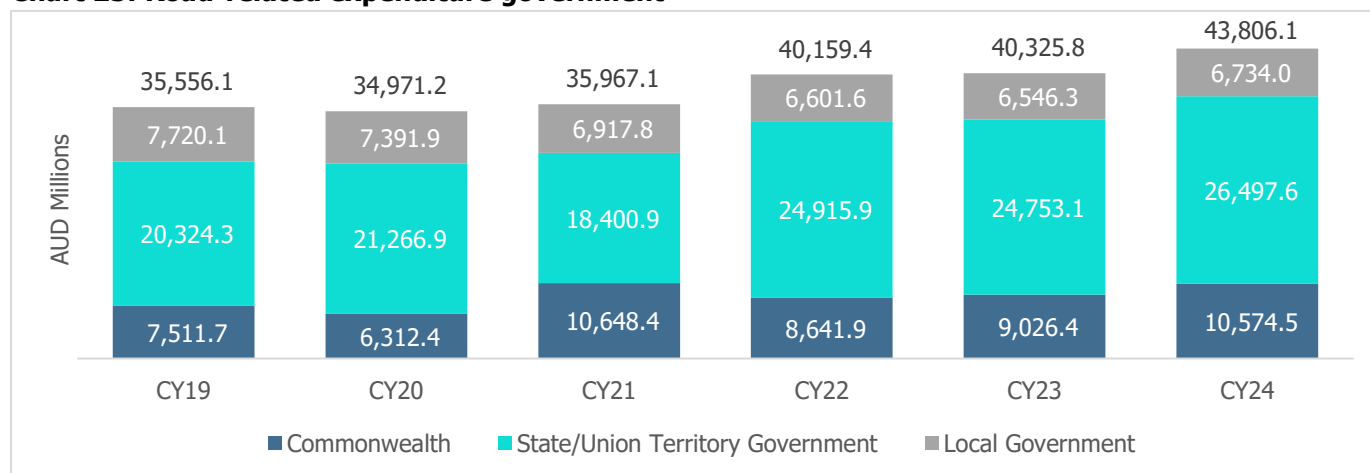
- India's road marking sector faces unique technical challenges due to the country's diverse climatic conditions, ranging from heavy monsoons and high humidity to extreme summer temperatures. These conditions require materials and application methods that can deliver consistent adhesion, durability, skid resistance and retroreflectivity across varying environments. However, the relatively fragmented and unorganised nature of the industry has limited investment in R&D, product development and adoption of advanced marking technologies, resulting in slower innovation in climate-resilient and high-performance road marking materials.

5 Road Safety in Australia

5.1 Road Related Expenditure

Australia's total government expenditure increased from AUD 35,556.1 in CY19 to AUD 43,806.1 in CY24, registering a CAGR of approximately 4.26%. State and territory governments remained the largest contributors, with expenditure increasing from AUD 20,324.3 to AUD 26,497.6 during the period, while Commonwealth expenditure increased at a CAGR of around 7.08%. Local government expenditure declined from AUD 7,720.1 in CY19 to AUD 6,734.0 in CY24.

Chart 25: Road-related expenditure government

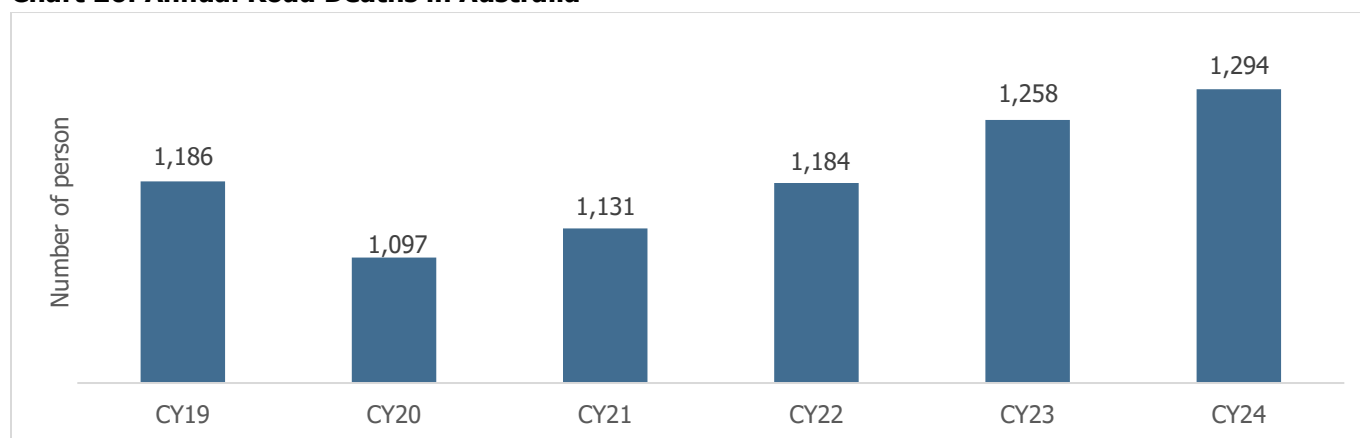


Source: Australian Infrastructure and Transport Statistics Yearbook, CareEdge Research, Note: Total public sector includes general government and public non-financial corporations.

Growth in government expenditure, particularly at the Commonwealth and state levels, supports continued road construction, upgrades and maintenance activity. This is expected to generate demand for road marking paints and related traffic safety materials across new and existing road networks.

5.2 Road Deaths in Australia

Australia's total road fatalities increased from 1,186 in CY19 to 1,294 in CY24 increasing further to 1,390 in CY25. After declining in CY20, fatalities increased in each subsequent year, with drivers accounting for the largest share, followed by motorcyclists. The Australian Automobile Association (AAA) has also highlighted the persistence of the road safety challenge, noting that road fatalities have continued to increase during most months since the commencement of the National Road Safety Strategy in CY21. Further, single-vehicle crashes account for a significant share of fatal crashes, reinforcing the need for continued investment in road safety infrastructure and measures aimed at improving road user guidance and visibility.

Chart 26: Annual Road Deaths in Australia

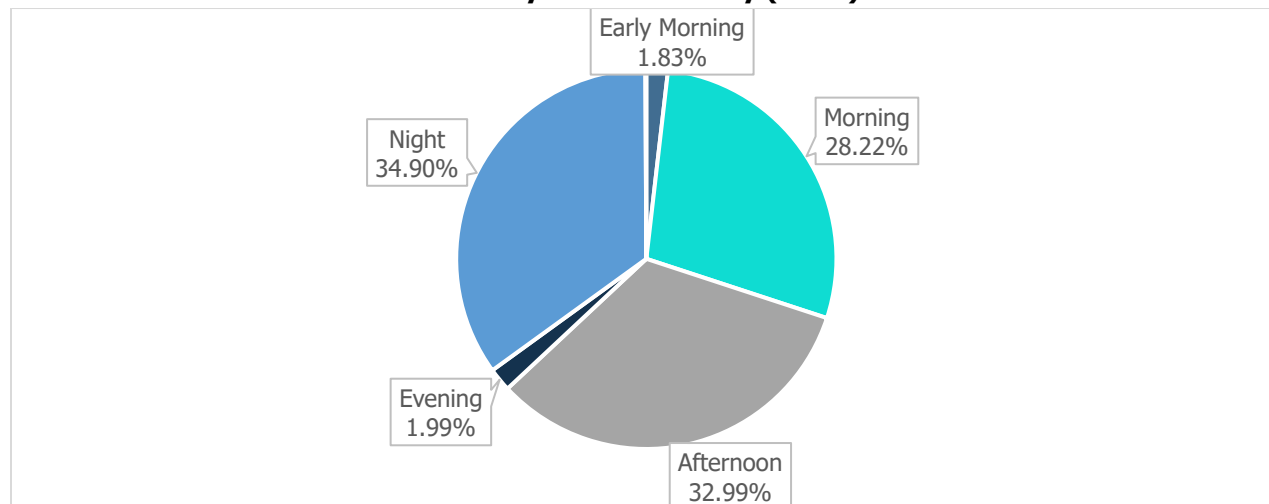
Source: Australian Infrastructure and Transport Statistics Yearbook, CareEdge Research, Note: The total includes deaths to persons with road user type not recorded

The continued focus on reducing road fatalities is expected to support expenditure on road safety measures, including lane delineation, edge lines, intersections, pedestrian crossings and reflective markings. This can support demand for road marking paints and associated materials across new roads as well as maintenance and safety upgrade programmes.

The Australian Government has also implemented the Black Spot Program, which targets road locations where crashes have occurred or where there is a significant risk of crashes. The program supports targeted safety improvements at identified locations, including interventions such as traffic signals and roundabouts, with projects selected in consultation with state, territory, and local stakeholders. The program complements broader road safety initiatives by directing investment towards locations where infrastructure improvements can reduce crash risks and lessen the severity of road accidents.

5.2.1 By Time of the day

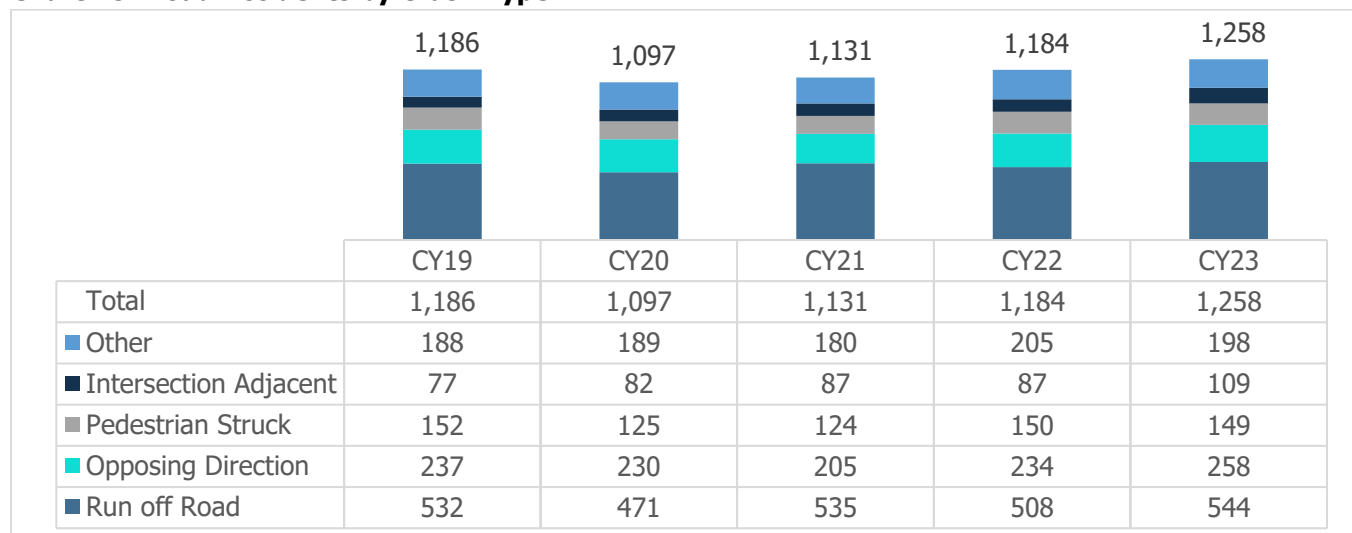
In CY23, road fatalities in Australia were concentrated during the night and afternoon, with 439 and 415 fatalities, respectively. Together, these periods accounted for around 67.89% of fatalities recorded across the reported time of day categories, followed by 355 fatalities during the morning. The higher incidence of fatalities during night-time periods also highlights the importance of road visibility and delineation under low light conditions. The concentration of fatalities during night-time and other lower-visibility conditions reinforces the requirement for visible and reflective road markings.

Chart 27: Road Deaths in Australia - By Time of the day (CY23)

Source: National Crash Dashboard, Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts, CareEdge Research

5.2.2 By Crash Type

During CY19-CY23 Run off road crashes remained the largest contributor to road fatalities in Australia, accounting for 2,590 deaths, or ~44.23% of total fatalities. Fatalities from opposing direction crashes increased from 237 in CY19 to 258 in CY23, while intersection adjacent fatalities rose from 77 to 109 over the same period. Together, these trends indicate continued safety risks associated with lane departure, opposing traffic movements and intersections.

Chart 28: Road Accidents by Crash Type

Source: National Crash Dashboard, Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts, CareEdge Research

The high incidence of run off road and opposing direction crashes reinforces the need for clear edge lines, centre lines, lane delineation and reflective markings. Intersection-related risks also support demand for stop lines, directional arrows, pedestrian markings and other high visibility road marking application.

5.3 Initiatives to reduce road accidents

National Road Safety Strategy 2021-30

Road trauma remained a key safety and economic concern in Australia leading up to the introduction of the National Road Safety Strategy 2021-30.

1 Why the Strategy is being promoted



2 Why stronger intervention was needed



3 Targets by 2030



*Baseline is a 3-year average based on hospital cases for 2017-18 and 2018-19, and estimates for 2019-20.

4 Long-term goal | Zero fatalities by 2050 and zero serious injuries by 2050

The Strategy provides the national framework to guide infrastructure, vehicle and road-user safety measures.



Implication for road marking companies

The Strategy's focus on infrastructure-led safety improvements supports demand for lane markings, edge lines, audio-tactile markings, intersection markings and reflective road delineation products.

Source: National Road Safety Strategy 2021-30

Black Spot Program

Australia's Black Spot Program continues to play a significant role in improving road safety by funding targeted upgrades at locations with a history of crashes or identified safety risks. The Australian Government is progressively increasing its commitment to the program to AUD 150 million annually, supporting safety improvements across state and local road networks.

Operating since its reintroduction in 1996, the program supports both reactive and proactive safety projects, funding cost-effective treatments such as traffic signals, roundabouts, pedestrian facilities, lighting improvements, safety barriers and other infrastructure measures designed to reduce road trauma.

Projects are identified and assessed by state and territory authorities, with recommendations reviewed through consultative panels to ensure investment is directed toward locations where infrastructure improvements can deliver measurable safety benefits.

For suppliers serving the road infrastructure sector, Black Spot projects can create ongoing opportunities associated with road delineation and pavement marking works. Safety upgrades at intersections, pedestrian crossings and high-risk road sections often require lane markings, edge lines, stop lines and other visibility-enhancing treatments that support safer road-user guidance.

6 Competitive Landscape

The following companies have been used for constructing a competitive landscape.

6.1 Kataline Limited ("Kataline" / "Company")

- **Year of Incorporation:** 2008
- **Headquarters:** Nagpur, Maharashtra, India
- **Description:** Kataline is one of the few, fully integrated traffic safety solutions providers in India, engaged in manufacturing and supply of a comprehensive portfolio of road safety marking products for the infrastructure, transportation, aviation, industrial and commercial sectors, with applications on asphalt, concrete surfaces, including roads, highways, bridges, flyovers, airports, parking areas, industrial facilities, pedestrian walkways and cycle tracks etc.

Kataline is also the largest company in India providing end-to-end traffic safety project execution services (by Revenue from Operations – Sale of Services in FY25), which enables it to participate across the value chain from the manufacturing of road safety marking products to their on-site application using advanced equipment.

Kataline has evolved from a road marking paint manufacturer into one of the few players in India with capabilities spanning advanced manufacturing, wide array of road safety marking products, in-house accredited quality testing and end to end project execution.

Kataline's location in Nagpur, Central India, provides a strategic geographic advantage by enabling efficient access to major road networks. The central location of its manufacturing facility and its connectivity to key transportation networks facilitate efficient procurement of raw materials and cost-effective distribution of its products to customers across India, thereby optimising logistics costs and improving delivery timelines.

Kataline is among the few manufacturers globally, one of only two manufacturer from Asia (Prisma Paints and Kataline Limited) and the only manufacturer from India currently listed by the Fédération Internationale de l'Automobile ("FIA") with paint homologated under FIA Standard 3503-2019 for motor racing circuits

- **Markets Covered:** Australia, New Zealand, Tanzania, Uganda, Kenya, Rwanda, Madagascar, Zambia, Ethiopia, Gabon, Ghana, Oman, Bahrain, Iraq.
- **Key Services:** Road and Highway Markings, Coloured Road Surfacing, Airfield Markings, Vertical Surface Markings, Parking and Industrial Markings, Raised Pavement Markers, Road Marking Equipment, Turnkey Marking Solutions.
- **Product offerings:** Thermoplastic, 2 Component Cold Plastic, Water Based Paints, Reflective Water Based Paints, Solvent Based Paints, Nightglow Paints, Primers, Drop on Glass Beads, Road Marking Equipment such as Road Studs, and Tunnel Fire Protection.
- **Capacity and Capacity Utilization:**

The following table sets forth information relating to the Installed Capacity, Available Capacity, Actual Production and Capacity Utilization of the Company, at their manufacturing facilities for the period indicated.

Facility/ forms	As of and for year ended March 31,		
	2026	2025	2024
Hot-applied Thermoplastic marking materials and Cold-applied Plastic material⁽¹⁾⁽²⁾			
Installed Capacity (MTPA) (A)	1,20,000	1,20,000	1,20,000
Available Capacity (MTPA) (B)	90,000	90,000	90,000
Actual Production (MTPA) (C)	35,696	28,721	28,615
Capacity Utilization (%) (D=C/B*100)	39.66	31.91	31.79
Water and Solvent Based road safety marking paints⁽²⁾			
Installed Capacity (Litres per annum) (A)	10,40,000	10,40,000	10,40,000
Available Capacity (Litres per annum) (B)	7,80,000	7,80,000	7,80,000
Actual Production (Litres per annum) (C)	4,61,900	3,63,980	3,97,620
Capacity Utilization (%) (D=C/B*100)	59.22	46.66	50.98

Source: Independent Chartered Engineer Certificate.

Notes:

(1)The Company manufactures Hot-applied Thermoplastic marking materials and Cold-applied Plastic material in powder and liquid form, respectively and are sold in kilograms packaging. Installed Capacity, Available Capacity and Actual Production for these products have been presented together in metric tonnes per annum (MTPA).

(2)Cold-applied Plastic material and Water and Solvent Based road safety marking paints are manufactured on a common production line. Accordingly, the Installed Capacity of such line is a shared capacity between these two product categories, and the capacity figures presented above should not be read as capacity that can be used for both products at the same time.

Assumptions for capacity calculation :- The information relating to Installed Capacity, Available Capacity and Capacity Utilization is based on various assumptions, including, among others, (i) 300 working days per annum with 8 hours of production per day to calculate Installed Capacity and Available Capacity; (ii) An operational efficiency factor of 75% for calculation of throughput rates applied for each machine or production line; and (iii) an estimated downtime period of 15 days per annum for scheduled preventive maintenance, equipment cleaning and statutory inspections. Capacity Utilization rates for historical periods are not indicative of future utilization levels and may vary depending on factors such as demand for its products, changes in consumer preferences, pricing dynamics, availability and prices of raw materials and packaging materials, inventory management, operational efficiency and unforeseen disruptions.

- While there are no listed peer for Kataline, Asian Paints PPG Private Limited and Automark Industries (India) Private Limited are consider peers for competitive landscape.

6.2 Asian Paints PPG Private Limited

- **Year of Incorporation:** 2011
- **Headquarters:** Mumbai, Maharashtra, India
- **Description:** Asian Paints PPG Private Limited is a 50:50 joint venture between Asian Paints Ltd. and PPG Industries. The company offers a wide range of coating solutions, including protective coatings, powder coatings, traffic solutions, and floor coatings. Additionally, Asian Paints PPG provides customized coatings for non-automotive OEMs.
- **Markets Covered:** N.A.
- **Key Services:** Protective Coatings, Powder Coatings, Traffic Solutions and Floor Coatings.
- **Product offerings:**

Protective Coatings	Powder Coatings	Traffic Solutions	Floor Coatings
POLYSILOXANE	Polyester Coatings	Hot Melt Thermoplastic	Fire Retardant Coatings
Glass Flake Coatings	Architectural Coatings	Coloured Surfacing Material	Car Deck Coatings
Surface Tolerant Coatings	Heat Resistance Coatings	Cold Applied Water Borne Acrylic Paints	Antimicrobial Coatings
Epoxy Primer	Wood Look Finish	Conventional Water/Solvent Based Acrylic Paints	Anti-Skid Coatings

- **Production Capacity:** N.A.

6.3 Automark Industries (India) Private Limited

- **Year of Incorporation:** 1988
- **Headquarters:** Yavatmal, Maharashtra, India
- **Description:** Automark Industries (India) Private Limited manufactures and markets thermoplastic road marking materials and machines. The company markets its products under the brand name 'Automark'. It has a pan-India network of sales representatives (channel partners).
- **Markets Covered:** N.A.
- **Key Services:** The company is into manufacturing and application of Thermoplastic Road Marking Material and other machinery, Equipment, Methodology, Health and Safety Information and Troubleshooting.
- **Product offerings:** Thermoplastic Road Marking, Glass Beads, Kerb & Road, Road markings, Area Marking & Cyclemark, Factory Baymarking, Runway, Taxiway, Apron at Airport, Reflective Pavement Markers, Tactile Tiles, Road Marking Machines.
- **Production Capacity:** N.A.

6.4 Benchmarking Based on Financial Parameters

Table 9: Revenue from Operations (Rs. Lakhs)

Particulars	FY24	FY25	FY26
Kataline Limited	15,627.91	15,893.21	22,058.02
Asian Paints PPG Private Limited	1,14,739.39	1,19,458.55	NA
Automark Industries (India) Private Limited	25,486.79	23,768.96	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 10: Growth of Revenue from Operations

Particulars	FY24	FY25	FY26
Kataline Limited	-4.26%	1.70%	38.79%
Asian Paints PPG Private Limited	12.56%	4.11%	NA
Automark Industries (India) Private Limited	12.06%	-6.74%	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 11: Sale of Products (Rs. Lakhs)

Particulars	FY24	FY25	FY26
Kataline Limited	11,567.15	12,490.23	15,501.12
Asian Paints PPG Private Limited*	7,982.06	9,207.29	NA
Automark Industries (India) Private Limited	22,687.53	20,544.69	NA

Source: Company Filings, , Note: Kataline numbers are taken from Restated Financial Statements, * only includes Turnover of product or service category from Road Marking Segment

Table 12: Sale of Services (Rs. Lakhs)

Particulars	FY24	FY25	FY26
Kataline Limited	4,060.76	3,402.98	6,556.90
Asian Paints PPG Private Limited	NA	NA	NA
Automark Industries (India) Private Limited	75.09	38.64	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 13: Gross Profit (Rs. Lakhs)

Particulars	FY24	FY25	FY26
Kataline Limited	5,128.55	5,655.29	6,896.38
Asian Paints PPG Private Limited	39,169.83	38,421.21	NA
Automark Industries (India) Private Limited	7,568.82	7,448.30	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 14: Gross Profit Margin

Particulars	FY24	FY25	FY26
Kataline Limited	32.82%	35.58%	31.26%
Asian Paints PPG Private Limited	34.14%	32.16%	NA
Automark Industries (India) Private Limited	29.70%	31.34%	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 15: EBITDA (Rs. Lakhs)

Particulars	FY24	FY25	FY26
Kataline Limited	2,370.32	2,446.11	3,626.45

Asian Paints PPG Private Limited	13,552.36	11,019.18	NA
Automark Industries (India) Private Limited	3,600.69	3,276.89	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 16: EBITDA Margin

Particulars	FY24	FY25	FY26
Kataline Limited	15.17%	15.39%	16.44%
Asian Paints PPG Private Limited	11.81%	9.22%	NA
Automark Industries (India) Private Limited	14.13%	13.79%	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 17: Profit after Tax (Rs. Lakhs)

Particulars	FY24	FY25	FY26
Kataline Limited	1,755.99	1,664.81	2,682.84
Asian Paints PPG Private Limited	10,017.86	7,526.97	NA
Automark Industries (India) Private Limited	2,703.94	2,381.15	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 18 Profit after Tax Margin

Particulars	FY24	FY25	FY26
Kataline Limited	11.24%	10.47%	12.16%
Asian Paints PPG Private Limited	8.73%	6.30%	NA
Automark Industries (India) Private Limited	10.61%	10.02%	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 19: Net Worth (Rs. Lakhs)

Particulars	FY24	FY25	FY26
Kataline Limited	7,210.89	8,870.17	11,553.84
Asian Paints PPG Private Limited	36,463.60	43,980.66	NA
Automark Industries (India) Private Limited	13,236.55	13,691.99	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 20: Return on Equity

Particulars	FY24	FY25	FY26
Kataline Limited	27.72%	20.71%	26.27%
Asian Paints PPG Private Limited	31.83%	18.71%	NA
Automark Industries (India) Private Limited	22.75%	17.68%	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Table 21: Return on Capital Employed (Pre Tax)

Particulars	FY24	FY25	FY26
Kataline Limited	38.14%	28.18%	34.86%
Asian Paints PPG Private Limited	41.16%	24.54%	NA
Automark Industries (India) Private Limited	25.81%	21.99%	NA

Source: Company Filings, Note: Kataline numbers are taken from Restated Financial Statements

Formulas Used

Parameter	Formula
Revenue	Revenue from Operations
Cost of Good Sold (COGS)	Cost of Material Consumed + Purchase of Stock in Trade+ Changes in inventories of finished goods, stock-in-trade and work-in-progress+Labour/Jobwork charges
Gross Profit	Revenue from Operations - COGS
Gross Profit Margin	Gross Profit / Revenue from operations
EBITDA	PBT+Depreciation and Amortization+Finance Cost-Other Income
EBITDA Margin	EBITDA/ Revenue from operations
Profit After Tax	Profit After Tax
PAT Margin	Profit after Tax/ Revenue from operations
Profit Before Tax	PAT+ Tax Expense
Net Worth/ Equity	Total shareholders' funds
Return on Equity (ROE)	PAT/ Average Equity
EBIT	PBT+Finance Cost
Capital Employed	Short Term Borrowings + Net Worth + DTL+ Current Lease Liabilities+Non Current Lease Liabilities - DTA
Return on Capital Employed (ROCE)	EBIT/ Average Capital Employed