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New opportunities for **steel** in **construction** and **infrastructure**

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IndianSteel
ASSOCIATION

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Foreword

The steel industry has been one of the bulwarks of India's rapid infrastructure development. And with the Indian government targeting a \$5 trillion economy by fiscal 2025, this is one industry whose fortunes look bright indeed, despite the recent turbulence due to the Covid-19 pandemic.

From a mere 22 million tonne in 1992, the industry has ramped up capacity to 142 million tonne in 2020, earning India the distinction of being the second-largest steel producer in the world.

And though the industry's contribution to India's gross domestic product stands at a mere ~2%, its multifarious application makes the metal a bellwether of economic activity.

The industry is also an employment generator, employing ~5 lakh people directly and ~20 lakh people indirectly, as per the National Steel Policy 2017.

As the country transitions into an economic powerhouse, steel demand is poised to log a compound annual growth rate (CAGR) of 7-7.5% between fiscals 2022 and 2025. A large part of this growth will be spurred by the government's Rs 111 lakh crore National Infrastructure Pipeline initiative through fiscal 2025. Here, the government's initiatives on housing (Housing for All), roads (Bharatmala), ports (Sagarmala), railways (dedicated freight corridors, metros, and bullet train), and airports (Udaan) will provide impetus.

For the record, the share of building and infrastructure construction in overall steel consumption is 60-65% today.

Apart from the opportunity from these major end-use segments, rising application of steel and new trends also present opportunities. Mandatory road crash barriers on national highways, rising concretisation, use of pre-engineered buildings, design changes in urban housing (underground parking and bigger span) – all augur well for steel demand in the long term.

In the milieu, the Indian Steel Association (ISA) continues to play a pivotal role and is conducting its flagship event, the ISA Steel Conclave, which provides a platform for the government, senior industry leaders, and allied partners to better understand the opportunities, challenges and trends in the industry.

This year, in view of the Covid-19 Pandemic, a series of ISA Webinars are being organised instead on topics concerning the steel industry. CRISIL Research is proud to be associated as the knowledge partner for the second edition of the Webinar.

This knowledge paper seeks to provide a holistic view of the opportunities for the steel industry along with challenges, and the impact of key government initiatives on the industry.

CRISIL Research thanks Dr Bhaskar Chatterjee, Secretary General, ISA, Mr Arnab Kumar Hazra, Deputy Secretary General, ISA, and other officials for their valuable inputs and suggestions and support on this knowledge paper.

Steel demand review

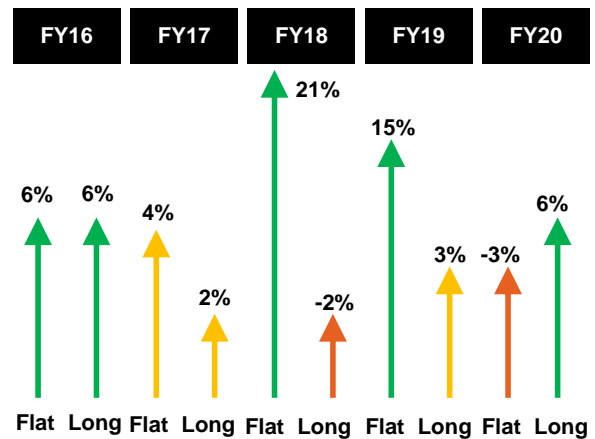
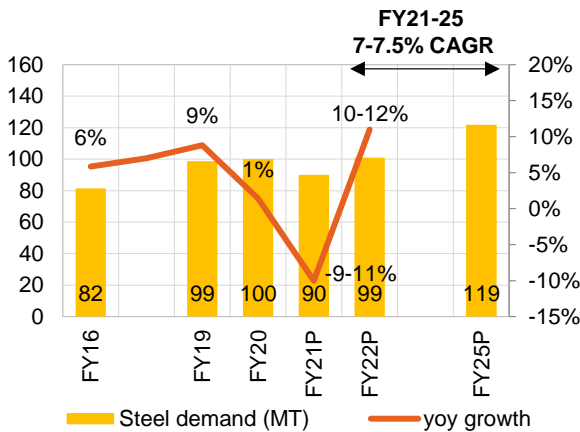
India’s steel demand logged a healthy 5.3% CAGR between FY 2015-16 and FY 2019-20 to touch 100 million tonne, largely spurred by the infrastructure sector, including railways.

Demand had shot up 8% on-year in 2017-18, post a low-growth trajectory over seven years, followed by a higher top of 9% on-year in FY 2018-19. The sharp rise was on account of higher infrastructure spending, spurred by automobile sales and strong construction activity aided by affordable housing. But

the industry was unable to sustain the growth momentum in 2019-2020 as demand lost steam.

In the current fiscal, we expect steel demand to contract by 9-11% on account of nationwide lockdown through April-May and slower-than-desirable ramp-up in manufacturing activities post that. While economic activity – and hence steel demand – has picked up from the third quarter, the huge blow suffered in the first two quarters is likely to weigh on the year.

Domestic steel demand trend



P: Projected

Source: JPC, CRISIL Research

Post fiscal 2020-21 we will see steel demand drive its growth trajectory to 7-7.5%, led by numerous government-led initiatives on infrastructure and housing, as well as the automotive sector. Low base of two years will also help.

A look at how key demand segments are expected to fare:

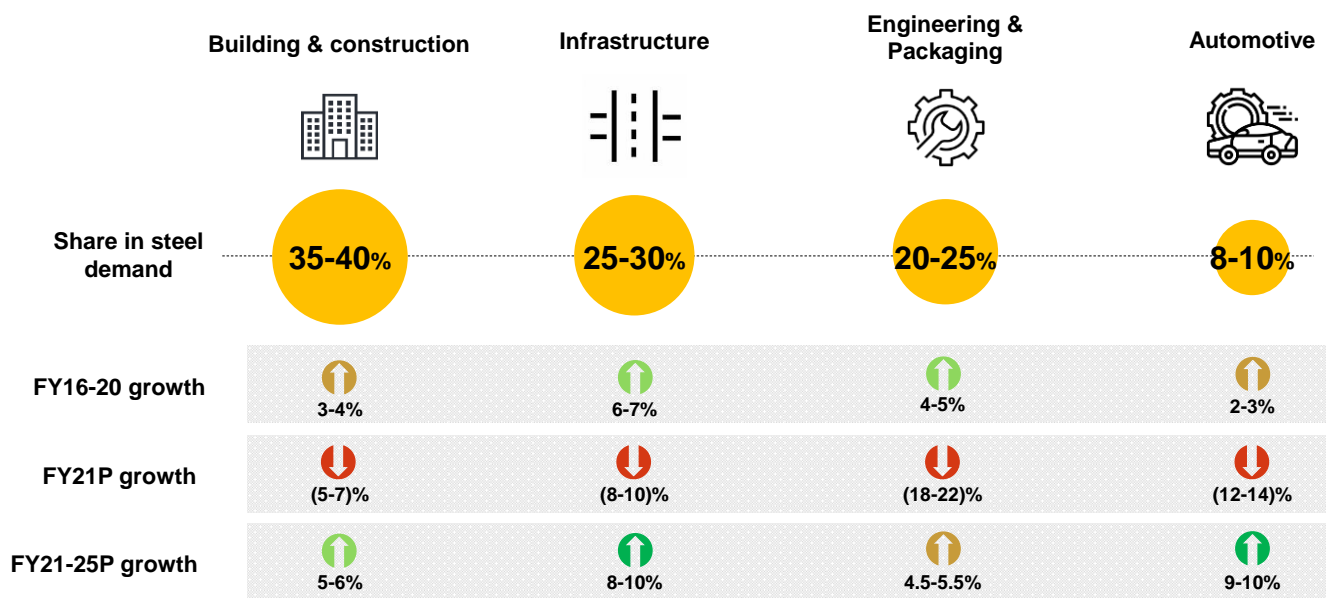
- Demand from **building and construction (B&C)** segment, which accounts for 35-40% of steel demand, is expected to rise 5-6% between FY 2021-22 and FY 2024-25, led by a pick-up in affordable housing, kutcha to pucca conversions in rural belts, especially in the East and Central regions, and real estate construction (given deferral in construction and RERA compliance).

- Demand from infrastructure sector is expected to be propelled by healthy rise in demand from roads, metro projects, and railways. Large-scale irrigation projects, especially in South and West, will also provide robust support. Deferral of capital investments in the past two years will also provide low base for support.
- **Engineering and packaging** sector will post modest growth of 4-5% between FY 2021-22 and

2024-25 as demand from conventional power segment stays weak. However, consumer durables and packaging sector should perform well.

- **Automobiles** industry will post healthy growth of 9-10% through FY 2024-25 after two successive years of decline.

Steel end-use demand segments

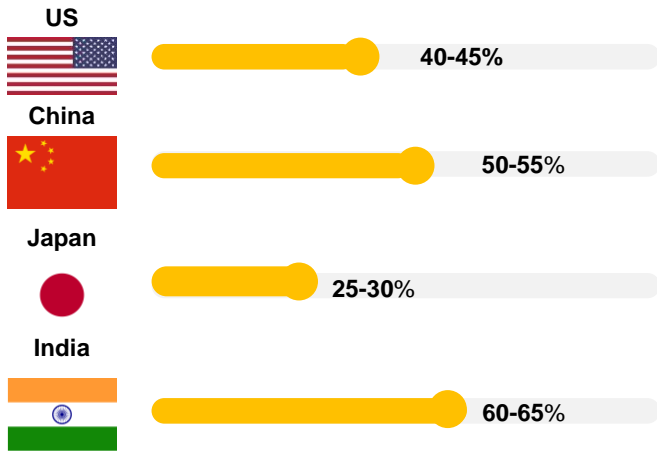


Source: Joint Plant Committee (JPC), CRISIL Research

Steel demand was already under stress as the pandemic marched in, causing havoc across downstream segments. While demand has seen sharp recovery in recent months, the steep decline witnessed in the first quarter amid stringent lockdown norms is expected to drive demand 9-11% lower in FY 2020-21.

In fact, steel demand, which plunged 55% on-year in the first quarter as the pan-India lockdown brought construction as well as manufacturing activity to a near standstill, has recovered sharply, limiting demand decline to only 17% on-year in the first nine months of FY 2020-21.

Share of B&C and infra construction in steel demand



The share of construction (B&C and Infrastructure) in steel demand is high at 60-65% for India. Similarly, China and the US have healthy share of the construction sector in steel demand, at 50-55% and 40-45%, respectively. On the other hand, Japan's share is low at 25-30%. Being a manufacturing hub, Japan sees high demand from automobile manufacturing (20-25%), shipbuilding and marine equipment (8-10%), as well as engineering and packaging.



Key demand drivers for building and construction

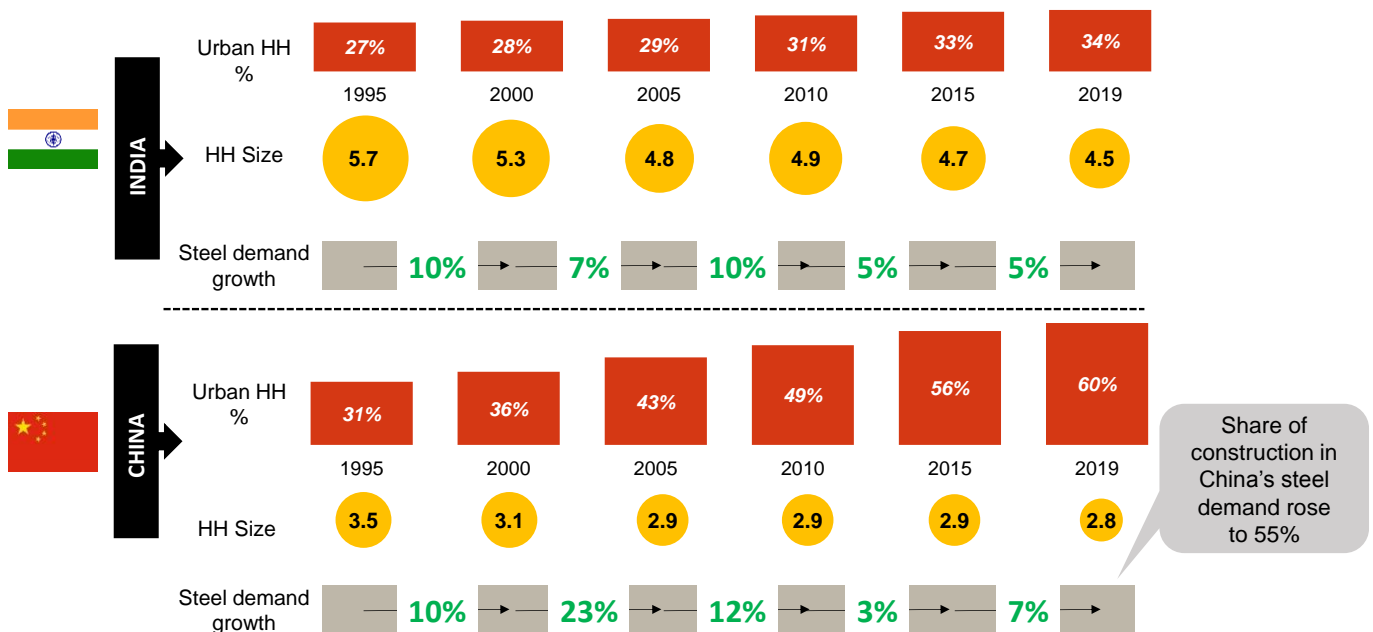
Steel demand from the building & construction (B&C) sector accounts for 35-40% of the country's steel demand. The housing segment accounts for around 70-75% share in the building and construction segment, with industrial and commercial segments making up the remainder.

A growing population, urbanisation, increasing pace of nuclearisation along with concretisation of kutcha houses under various central and state government-led programmes will be key demand drivers for the segment. While population growth is likely to moderate in the longer run, rapid urbanisation and

nuclearisation will drive incremental demand for housing over the long term. Supporting demand will also be multiple ownership of houses in urban areas, rising affluence of the middle class, and upgradation of houses.

A parallel can be drawn with China, which saw urbanisation double over the past two-and-a-half decades along with nuclearisation, enabling steel demand to rise by over 10 times. India's low level of urbanisation and high household size at 4.5 present a big opportunity for the housing sector, which is likely to augur well for steel demand.

Low urbanisation provides high potential for steel



Source: JPC, World Steel Association, Census India, National Bureau of Statistics (China), CRISIL Research

Within the building and construction space, rising share of high-rise construction (even in Tier II and Tier III cities) and reduced column sizes for larger parking spaces, etc, will increase steel demand, given higher intensity. In the top 8 cities in India, we have ~1.2 billion square feet under construction, which will help steel demand over the next 3-4 years.

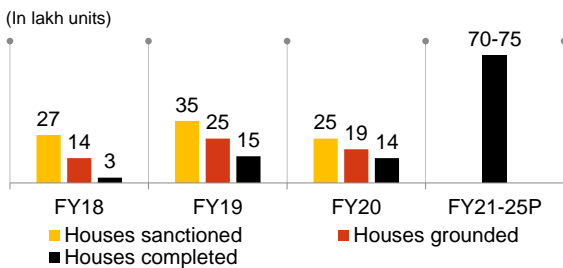
Also, introduction of modern techniques such as monolithic construction for faster execution of projects will drive long steel demand, although penetration of these techniques is at a nascent stage.

Government initiatives on the housing front through the Pradhan Mantri Awas Yojana (PMAY) scheme for urban and rural areas will help drive steel demand growth. In rural areas, PMAY-G has a target to construct 29.5 million houses with all basic amenities by 2022. Despite strong progress under the scheme, only 12.5 million units have been constructed, which leaves 17 million units. Similarly, in urban areas (PMAY-U) is targeting 11.2 million units, of which only 4 million units have been completed till date. With similar units under construction, demand from the segment is set to accelerate in the near term.

Affordable housing trend

PMAY-Urban

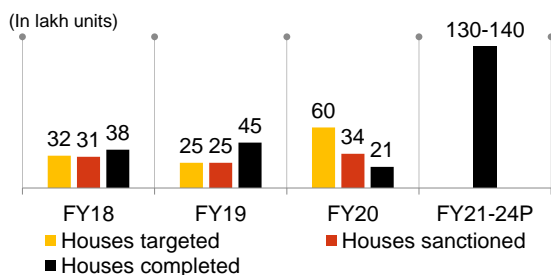
Housing shortage  **112 lakh units**  **15-17 million tonnes** (for entire project cycle)



Under construction  **30 lakh units**  **4-4.5 MT**

PMAY-Grameen

Housing shortage  **295 lakh units**  **23-25 million tonnes** (for entire project cycle)



Under construction  **24 lakh units**  **1.8-2 MT**

Source: Industry, Ministry of Housing and Urban Affairs, Ministry of Rural Development, CRISIL Research








Key demand drivers for infrastructure space

Steel demand from the infrastructure sector including railways comprises of 25-30% of the country's steel demand. Within infrastructure space roads and highways, along with railways (including metros) segment together account for 50-60% of steel demand from the infrastructure space. Other significant contributors include irrigation and dams along with water supply and sanitation.

Steel demand growth from infrastructure space has risen by 6-7% over past five years primarily driven by healthy growth from national highways construction as well as steady investments in railways (dedicated freight corridors, railway electrification, and slew of metro projects across cities).

Key demand drivers for infrastructure

	Sector	FY20 infra investments Rs lakh crore	Source of funds FY20			FY16-20 CAGR	NIP outlay Rs. lakh crore	% under construction
	Roads	2.7	36%	49%	15%	17%	20	45-50%
	Railways	1.4	89%	11%		12%	14	55-60%
	Urban Infra	0.9	26%	63%	35%	14%	11	55-60%
	Irrigation	0.9	100%			6%	9	55-60%
	Power & other infra	5.5	—			3%	57	30-35%

Centre
State
Private

Source: Industry, CRISIL Research

In FY 2020-21, we expect infrastructure investments to suffer due to diversion of funds towards social and welfare schemes (from both central and state funds). At Rs 4.68 trillion, budgetary allocation to capital expenditure (capex) in infrastructure for the fiscal was 7% below the revised estimate for FY 2019-20 even before the pandemic. Given the low base of FY 2020-21, an optical recovery is to be expected next fiscal, but constrained central and state finances will be a key monitorable.

However, steel demand will see a healthy 8-10% growth from infrastructure space between FY 2021-22 and 2024-25, driven by pick-up in infrastructure

investments under National Infrastructure Pipeline (NIP) given that 40-45% of the set target of Rs 111 lakh crore is under construction phase and the government will attempt to infuse investments to drive the economy back to recovery path.

Growth from roads & bridges is likely to be driven by the Bharatmala scheme, under which the government plans to construct 83,000 km of national highway in two phases. Additionally, given the low penetration of surfaced roads in key states, the state governments are expected to increase their budgetary allocations to roads and bridges.






Investments in railways is also expected to witness robust growth driven by government plans of rail network augmentation, freight line de-congestion, station modernisation and redevelopment, metros, and high speed rail project.

Government focus on increasing the country's net irrigated area (through initiatives like PMKSY) led to strong growth in investments and thereby steel consumption from irrigation during the past few years. Post FY 2020-21, focus on increased irrigation spending by key state governments and low

penetration of irrigated area is expected to drive healthy growth in investments especially in states of AP / Telangana, Karnataka, Maharashtra, etc.

Steel consumption under water supply and sanitation witnessed moderately healthy growth in the past few years, driven by sanitation projects as Swachh Bharat Mission. The government's vision to ensure safe piped drinking water to all households through Jal Jeevan Mission is expected to drive healthy growth in investments and potentially generate 11-13 million tonnes of potential steel demand.

Key government initiatives on infrastructure front

	Bharatmala	Sagarmala	Freight Corridor	Jal jeevan	Udaan
Potential Steel Demand of entire project	18-20 MT	13-15 MT	6-7 MT	11-13 MT	7-9 MT
Signpost					
Objective	Construct 83,000 km to connect India (phase I will see 34,800 km at estimated outlay of Rs. 5.35 lakh crore)	Rs 8.5 lakh crore for port modernization through >577 projects during 2015-2035	Rs 81,500 crore planned construction capex in 2 freight corridors (3360 km)	Invest about Rs 3.5 lakh crore by FY 2023-24 to provide safe drinking water to all rural households	100 new airports over next 20 years
Status	2,921 km constructed under Bharatmala Pariyojana and 12,413 km awarded (as on Oct 2020)	Limited progress	As of Sep 2020, physical and financial progress of 63% and 61% achieved under EDFC and WDFC respectively; ~98% of land is acquired	At present, 29% of Indian households have tap connections	Limited progress



Source: Industry, CRISIL Research

The government has also increased budgetary allocation to aid execution through the engineering, procurement and construction route, as developers overcome their financing constraints. It has introduced new avenues to finance projects as well, such as investment trusts and National Investment and Infrastructure Fund.

Steel demand will also emanate from the urban infrastructure sector. CRISIL Research projects

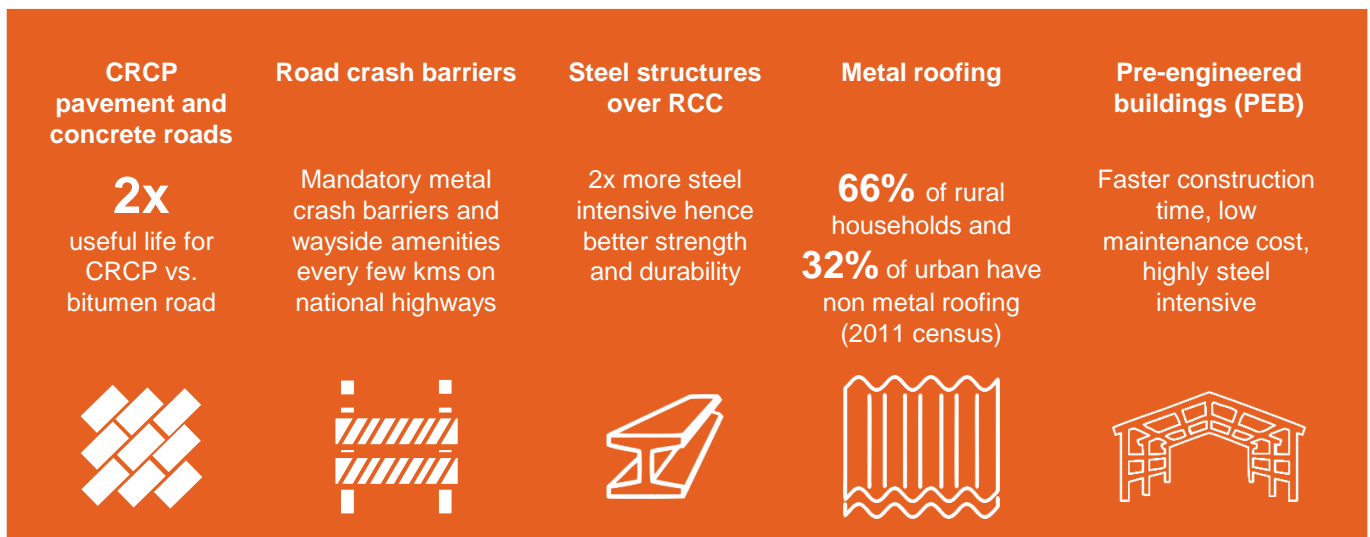
investment in India's urban infrastructure to be driven by government schemes, such as Atal Mission for Rejuvenation and Urban Transformation, Swachh Bharat Mission (SBM), Clean Ganga, and Jal Jeevan Mission. Government schemes, such as the SBM, Jal Jeevan Mission, and National Mission for Clean Ganga are likely to boost water supply and sanitation investments.

Key emerging trends and opportunities

Healthy asset growth in building and infrastructure construction post FY 2020-21 presents a good opportunity for healthy steel demand growth. But over and above that, several other potential factors in building and infrastructure construction will boost steel intensity as well as application, driving a 6-7% growth between FY 2021-22 and FY 2024-25.

Over the medium to long term, we expect to see several new trends that augur well for steel demand. Shift to steel-based structures, continuously reinforced concrete pavements (CRCP) pavement and concrete roads, metal roofing, and pre-engineered buildings (PEBs) are some of the key trends that will benefit steel application.

Key trends impacting steel applications in construction space



Source: Industry, CRISIL Research

Emphasis on metal roofing, especially in rural areas, holds high opportunity for unlocking steel demand, given that in India close to 32% of urban houses and 66% of rural houses are reported to have roofs made of clay tiles, burnt bricks, and stone (non-metal) as per Census 2011. Conversion of these houses to metal roofing alone can translate to potential steel demand of 10-15 million tonne over the course of conversion.

The emerging trend of PEB-based structures instead of traditional RCC-based design will also boost steel intensity as the majority of its components such as column, rafter, purlin, and girts are made of steel. PEB-based structures have proven benefits like

faster construction time and low maintenance cost, thereby providing better cost economics during its lifecycle.

As for CRCP pavements, these result in lower maintenance and higher useful life. The concept is widely adopted globally as it provides better long-term cost dynamics and lower maintenance cost. Compared with bitumen roads, CRCP stretches lead to a better lifecycle cost as the associated maintenance cost is low. India is slowly transitioning towards concrete and CRCP and in the long term, this can potentially be a key driver for the steel sector as a CRCP stretch uses steel throughout its length.

Metal crash barriers have already been mandated by NHAI on national highways, road stretches on high altitudes, industrial zones and road stretches that witness heavy vehicular movement. Installation of crash barriers on both sides of a road stretch will further push steel demand growth.

Also, NHAI is planning to set up wayside amenities every 50-60 km on national highways to improve passenger convenience in-line with global practices. Every wayside amenity will house restrooms, petrol

pumps, ATMs, etc. hence aiding construction and hence steel demand growth from the same.

Focus on shift from RCC to steel structures for better durability, particularly in bridges, also bodes well for steel demand growth in the long term. Steel-based structures, though costlier than RCC designs, typically provide better lifecycle value as these comprise nearly two-thirds steel compared with less than a third for RCC structures.

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