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FUTURE OF INFRASTRUCTURE IN INDIA OPPORTUNITIES, CHALLENGES AND IMPLICATIONS

The Indian government over the last one and half decades has taken numerous initiatives and policy changes to foster investment in the infrastructure sector. The themes, therein, have focused around inclusivity, in terms of providing infrastructure to the more remote and underserved corners of the country and in enhancing the bottlenecked infrastructure. In the last five years, there is also a greater focus on timely completion of such projects with the government taking up initiatives in removing policy and infrastructural road blocks to encourage investment in this sector.

Post liberalization, first few years were focused on attracting private investment in infrastructure. The proposed policies and structures resulted in healthy response in most sectors of infrastructure. However, over the years increasing private competition and varying degree of potential of projects in infrastructure resulted in mixed bag of performing and non-performing assets. Regulators have continuously innovated models to suit the requirements of future. However, this has resulted in different vintage regulations relevant for competing projects. In the last few years, there have been areas where private participation has diminished and capital availability & servicing has been a concern. It is in this backdrop that this paper tries to evaluate future of infrastructure in India.

In the following section, we review five sectors that form the core of infrastructure – Energy, Roads, Railways, Ports and Telecom in terms of the Opportunities, Challenges and Implications that lie ahead

	Opportunities	**Challenges**
<u>Energy</u>	• The overall electrical energy demand is expected to grow at 4-5% CAGR to reach 13,000 – 16,000 TWH by 2040 from 5,000 in 2012 • The government, in the draft NEP, has set a target of 29-36% of energy generation from renewable energy sources (excluding large hydro) by 2040 from the 6.5% level as on FY16	• Technical challenges exist for managing variability in renewable power generation • Cancellation of PPAs by some state run DISCOMS have set a bad precedent for investors interested in power generation projects • Reduced utilization levels in thermal power could deter further investment in the sector
Implications	• Investors risks in this sector related to PPA cancellation need to be mitigated. Regulators may need to step in and reinstate this confidence • Companies that are dependent on coal powered thermal power plants would need to increasingly rely on more renewable sources of power • Regulator may need to upgrade their grid technology, operation protocols and identify new sources of power that can better balance the variability in power generation due to renewable sources • Technology partners for renewable sources may need to work on their commercial structures to allow power companies to have a lower cycle of returns and option of upgradation	

<table>
<tr><th></th><th>Opportunities</th><th>Challenges</th></tr>
<tr><td><u>Ports</u></td><td>• The Sagarmala project initiated during FY17 has total of 415 projects ranging from port modernization, connectivity, port led industrialization and coastal community development with an estimated cumulative investment of INR 8 lakh Crores and is to be implemented phase-wise till 2035
• 6 new mega ports have been identified that would add 400 MTPA of cargo handling capacity – Vadhavan (Maharashtra), Enayam (TN), Cuddalore (TN), Machilipatnam (AP), Paradip South Satellite Port (Odisha), Sagar (WB)
• 26 port-rail connectivity projects have been identified as part of National Perspective Plan with work having commenced for five projects
• 277 hectares of port based SEZ is expected to be developed by end of 2018 with an overall investment of INR 532 Crores</td><td>• Pending regulatory issues related to tariff with some private participants
• Lack of good last mile road connectivity and automated entry for trucks in ports such as JNPT and Chennai leading to congestion and higher transaction costs
• Inadequate draft has prevented ports from attaining their full potential in some regions</td></tr>
<tr><td>Implications</td><td colspan="2">• Regulators should consider fast tracking road widening projects and implementation of automated system for entry of trucks to reduce congestion at key ports
• Ports need to increase spending on dredging activity to increase draft for accommodating larger vessels
• Development of coastal industrial regions and increase in share of these regions for global supply chain operations across commodities will be critical to generate adequate demand</td></tr>
</table>

	Opportunities	Challenges
<u>Railways</u>	1 • 00% FDI is allowed for construction, operation and maintenance of railway infrastructure such as suburban corridors, High speed train projects, dedicated freight lines, rolling stock, railway electrification, Signaling systems, Freight terminals, Passenger terminals, Infrastructure in industrial park for railway line/sidings and Mass Rapid Transport Systems. • Dedicated freight corridors – Western DFC and Eastern DFC have been fast tracked and all sections for Western DFC have been contracted and over 80% of civil works and over 60% of system works for Eastern DFC have been contracted • Further, East – West , North- South and East coast corridors have been identified for future development • To increase transparency, measures as following have been taken: o 100% e-procurement for goods, freight and services o Rationalization of freight charges for coal and iron ore o Automatic freight rebate in traditional empty flow direction traffic • The Indian railway station redevelopment program plans to redevelop 400 stations across 100 cities with an estimated outlay of INR 1 lakh Crores. The notice tendering the first set of 23 stations has already been released • Railway infrastructure development fund aims to mobilise ~USD 5 Bn in non-government funding from domestic and international institutional investors line pension funds and insurance companies for funding internal and SPV led railway projects	• Delays in environmental clearance and land acquisition has resulted in delays. This trend could replicate for other DFCs as planned • More schemes and faster evaluation process required for encouraging private participation in moving stock investments • Integrated multi-modal policy initiatives required to fast track development of industrial and logistics parks on the DFC • Station development is a relatively new initiative and success in the initial phase of 23 stations would determine the interest in the other remaining ones.
Implications	• Opportunities for private developers / EPC companies for multiple kinds of projects exist ranging from redevelopment of stations, to construction of dedicated freight lines, manufacture of rolling stock etc. • Private participants need to bring India focused innovative models and technology to augment existing capacities • RIDF bonds provide opportunities for funding agencies like insurance and pension funds with investment target in fixed income instruments	

	Opportunities	Challenges
<u>Roads</u>	• The “Bharatmala” project launched in May 2017, expects to add ~51,000 km of roads at an estimated cost of INR 10 trillion over the next 5 years to link border roads, build coastal and port roads, international connectivity roads and develop economic corridors, inter corridors and feeder routes • Key measures for the sector include o 100% FDI allowed o Right of way (ROW) for project land would be made available to concessionaires free from all encumbrances o New projects are now bid under the Hybrid annuity model where 40% of the cost paid out by the government as fixed annuity out over the first five years and the remaining 60% is a variable annuity depending on value of assets created removing the toll risk for the developer • The pace of road construction was 22.5 km per day in FY17 (8,231 km) and the government is targeting 15,000 km of completed roads in FY18	• Land acquisition and forest clearances are the key challenges to road widening projects for NHAI • Quality of earnings from existing PPP projects which witnessed aggressive competitive bidding • Utility shifting work, non-availability of aggregates present additional problems in maintaining the pace of road construction, especially in hilly North eastern states.
Implications	• There is a possibility of private participation initiatives in existing developed NHAI road assets • The rate of awarding new construction projects and the newer financing model provides ample scope for contractors to win and profitably execute projects across India • Private participants may consider developing supply chain for aggregates and other input materials to keep pace with the construction needs • Regulators may consider to promote the new online portal of “Bhoomirashi” (launched in June 2017) to speed up land acquisitions	

	Opportunities	Challenges
<u>Telecom</u>	• Phase 1 of Bharatnet that aims to connect 1 lakh of the 2.5 lakh gram panchayats (GP) is expected to be completed by March 2019. Over 36,000 GPs are currently active while over 1,00,000 GPs have been connected with optical fibres. • Phase 2 would involve connecting the remaining 1.5 lakh GPs and phase 3 would involve creating state of the art, future proof networks including fiber between districts and blocks with ring topology to build redundancy. • As per the Digital India initiative, 55,600 villages without a mobile coverage are to be connected	• Failed vendor testing, inadequate equipment and right of way related issues have delayed the progress in Phase 1 of Bharatnet that was expected to completed by March 2017
Implications	• Network equipment and infrastructure providers would have to scale up to complete the project in the prescribed timeline • Local bodies would have to work seamlessly with the Department of Telecom to address issues related to right of way	

Globalization in infrastructure

Over the last decade, there has been a push from leading economies to develop infrastructure that span across multiple adjacent countries to foster both newer channels of trade & commerce as well as to develop economic corridors that the multiple connected countries would benefit from.

In the following section, we review many such initiatives in the Asian and Indian subcontinent context, in terms of their proposed objectives and their status so far.

Chinese initiatives – OBOR
The Chinese One Belt One Road (OBOR) project is structured across 6 corridors and the maritime silk road (that reaches Mediterranean and Caspian Seas through Singapore) and seeks to connect with 65 countries across Asia, Africa and Europe. The project addresses multiple strategic concerns of China as are outlined below:

Increasing economic influence: This initiative is aimed at increasing economic & trade cooperation in countries in West and Central Asia, Europe and North Africa and build influence over time.

Economic recovery: With the economic slowdown in China, the project aims at creating new markets for Chinese companies. In addition, it also aims to decrease the regional disparity between the more affluent Eastern Coastal regions and the western parts of the country.

Energy: One of the other strategic reasons is to access the regional energy resources in Central Asia, East Asia, West Asia and South Asia than rely on large sources of fuel.

Status: ~34 countries and international organizations have signed bi-lateral agreements with China to build OBOR. Rail connectivity projects from China to Laos and China to Thailand and a number of highway construction projects including China – Pakistan and China – Bangladesh – India – Myanmar economic corridors have begun. Chinese companies had invested USD 15 Bn in 49 countries related to OBOR in 2015 alone.

SASEC (South Asia Subregional Economic Cooperation program)
The SASEC program was launched by ADB in 2001, to drive regional cooperation in the associated countries of Bangladesh, Bhutan, India, Maldives, Nepal and Sri Lanka in the six sectors of transport, energy & power, environment, tourism, information and communication technology.

By 2016 over USD 9 bn of projects had been initiated and are in different stages of completion.

One of the key current projects is to build the Imphal-Moreh corridor, would connect to the India – Myanmar – Thailand trilateral highway that ranges from Moreh in India to Mae Sot in Thailand. It is also proposed to connect this highway all the way to Cambodia, Laos and Vietnam through the East West Economic Corridor.

Indian initiatives – Feni River bridge
India has initiated the construction of bridge on the river Feni that would connect South East Bangladesh with the Indian state of Tripura. This would help India access the Chittagong port to transport goods and heavy machinery to the North East region and reduce the overall transit time to the region.

For example, the distance from Agartala to Kolkata through Assam is 1,650 km while through Bangladesh it is only 350 km and bypasses the multiple hilly roads and hairpin bends that increase travel time to the north east.

The project has been assigned in March 31st 2017 and is expected to be completed in 3-4 years

Indian initiatives – Mechi River bridge

The Union Ministry has approved a Memorandum of Understanding in Aug 2017 to construct a new bridge over the Mechi river connecting Kakavritta in Nepal and Panitanki bypass in India.
This marks the last stretch Asian Highway No. 2 and provides critical connectivity with the land-locked country. This bridge is also expected to improve cross border trade between the two countries

Lapiz Lazuli Corridor

The Lapis Lazuli Corridor is an agreement between Afghanistan, Turkmenistan, Azerbaijan, Georgia and Turkey that seeks to foster trade cooperation by reducing barriers facing transit trade.
This corridor connects the signatory countries by road and rail and presents to be one of the most economical channel for trade from Afghanistan. It is an entry channel to trade with Europe given Afghanistan's relatively poor linkages with Pakistan's ports.
Pakistan also joined the agreement in November 2016 and would strengthen the route to Gwadar port which forms one of the key channels for trade with Afghanistan today.

Wakhan Corridor

The North Eastern Afghan territory near the Pamir and Karakoram mountains, forms the Afghan border with China. The route has seen renewed interest post completion of the Lowari tunnel in Pakistan in July 2017. The bilateral trade between China and Afghanistan has crossed USD 1 Bn every year since 2014 and investment in this corridor could be the next step in creating a more direct China – Aghanistan link in the future.

To sum up, over the last 2 decades, a slew of new international infrastructure initiatives in the South Asian region have commenced to improve transport efficiency and connectivity with adjacent countries. Large international initiatives like the Asian Highway and OBOR have initiated activity on multiple other enabling infrastructure projects with funding support from individual governments and agencies like Asian Development Bank, AIIB of China and JICA.
Most of these initiatives are in various stages of execution and completion and their ensuing positive impact would be felt starting the next decade.

Key takeaways: Economic Times Infra focus summit 2017

Infrastructure has always been the backbone of most sectors in the economy. It has been proven across the world that an able infrastructure has spillover effects in terms of improved GDP growth rate and the influence on social well-being in the country.
Across the world, governments and regulators have tried various methods of creating infrastructure ranging from dedicated public spending, public private partnerships (PPP) to special tax rebates to incentivize investment. Over the last two decades, India has also seen a tremendous growth in private participation in infrastructure on back of schemes through public agencies like NHAI, LPAI, Indian Railways, and the government continues to incentivize participation through projects like Sagarmala, Bharatmala etc.
It is now important to learn and unlearn through some of our experiences over the last two decades and plan for the future wave of growth.

Some of the key takeaways from the summit are as follows

Infrastructure sectors:

Infrastructure in India is currently being given a high impetus with new policies and with unprecedented levels of deployment in areas such as highway development. In addition to the five conventional sectors as mentioned before, investors have been bullish on sectors like affordable housing, rooftop solar projects, waste management among others.

The Indian government is also developing airports in smaller cities at a high rate. 30 new airports in tier 2/3 cities are being developed with overall INR 200 Crores in viability gap funding by the government. The overall domestic passenger trips has also increased from 100 M in FY14 to 160 Mn in FY17 showing the growth in the sector

New funding agencies

Banks have conventionally been the funding agencies for infrastructure projects which usually have a life span ranging from 25 – 30 years. However, banks are considered to be best equipped to handle loans of 12 – 15 years with the limit being pushed to 15 – 18 years. Therefore, options of converting the loans to bonds after the period of construction of 3-5 years need to be evaluated. This however would require sufficient investor buy-in and risk appetite from the market as currently AA and higher rated bonds are preferred while the infra bonds are expected to have a rating lower than A. The conversion of loans to bonds has an impact on banks as the investments would move from the loan portfolio to the investment portfolio which would revise the priority sector lending requirements for the bank.

In addition to banks, newer entities are emerging for infrastructure related financing. For example, AIIB of China have sanctioned a USD 150 Mn infra fund in June 2017. NBFCs like IIFL sources funds from pension funds and insurance companies and deploys them in infrastructure focused funds.

The government of India has created National Investment and Infrastructure fund for enhancing infrastructure financing in the country. The fund has the mandate to make direct equity investment in projects. The proposed corpus is INR 40,000 Crores and the government is expected to hold 49% of equity in the fund.

Risk assignment

While regulators and financiers are increasingly allocating risks to the right entity that are better equipped to manage the risk. With the hybrid annuity model, the regulators have taken away the toll risk from the developers in the road sector.

Institutions with their masala bonds, have been able to do away with the exchange rate risk exposure to the borrowers and this has been well accepted in the market

The borrowers and contractors however have to manage their normal business risks including any political risks and have to take adequate precautions including insurance if available. These include projects by Indian companies in foreign territories

Other discussion points

NHAI has improved on clarity in procurement prices through its ENAM website for building materials. This has, in certain locations, helped reduce the price of raw materials like cement

NHAI also has built the IRCON website for bringing efficiency in evaluating consultants and is now able to do so in less than a day's time frame for select projects

India is now signatory to the TIR convention with over 70 signatories for promoting international road transport

Key takeaways: Investor Discussion

The overall discussion was focused on key concerns that are faced by the industry / investors and the current industry view of market participants. Some of the key pointers are as follows:

Current Situation

For companies that have invested in thermal sector now receive tough competition from wind and solar power plants where price parity between various sources of energy is being targeted. In addition, with coal linkage issues, the investors in this sector have been deeply affected. Customers that have signed PPAs are also not drawing power due to this.

IIFCL is one of the primary infrastructure financing body in India. Organizations like IIFCL contribute to around 20% in projects as equity.

Some private sectors banks have slowed down deployment in this domain over the last few years. PSU Banks have also been cautious in the last few years

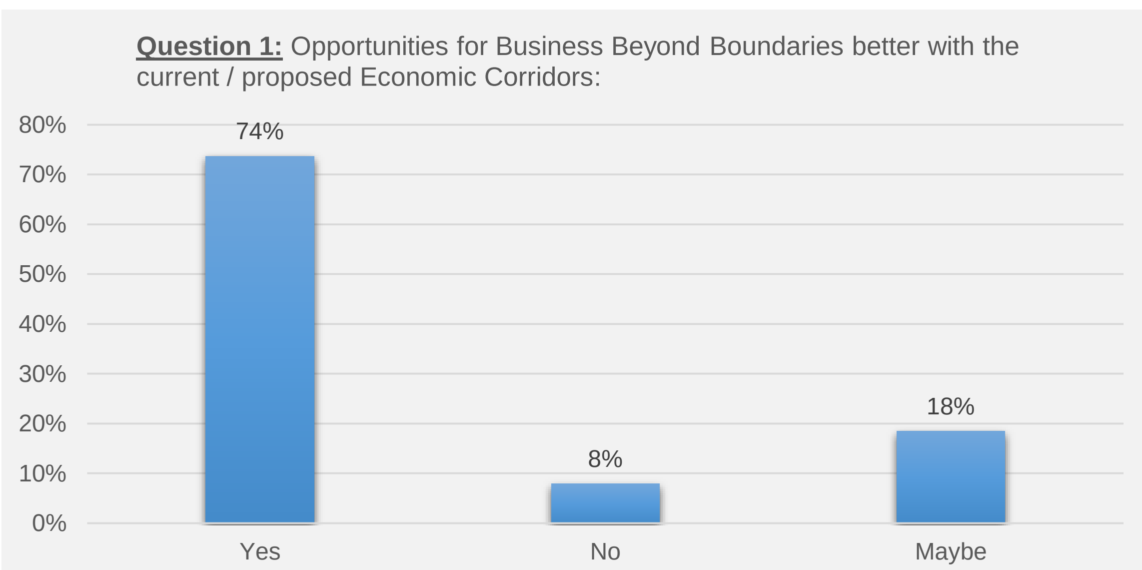
Some banking institution are exploring new funding avenues. With the change of Build Operate Transfer (BOT) to Hybrid Annuity Model, with availability of appropriate single window clearances prior to launch of projects, with incentives for finishing projects on time and regular reviews of projects with lenders, concessionaires and infra companies have led to tremendous growth in the road sector. Banks have started doing greenfield and brownfield projects with dedicated engineers and other necessary professionals on board.

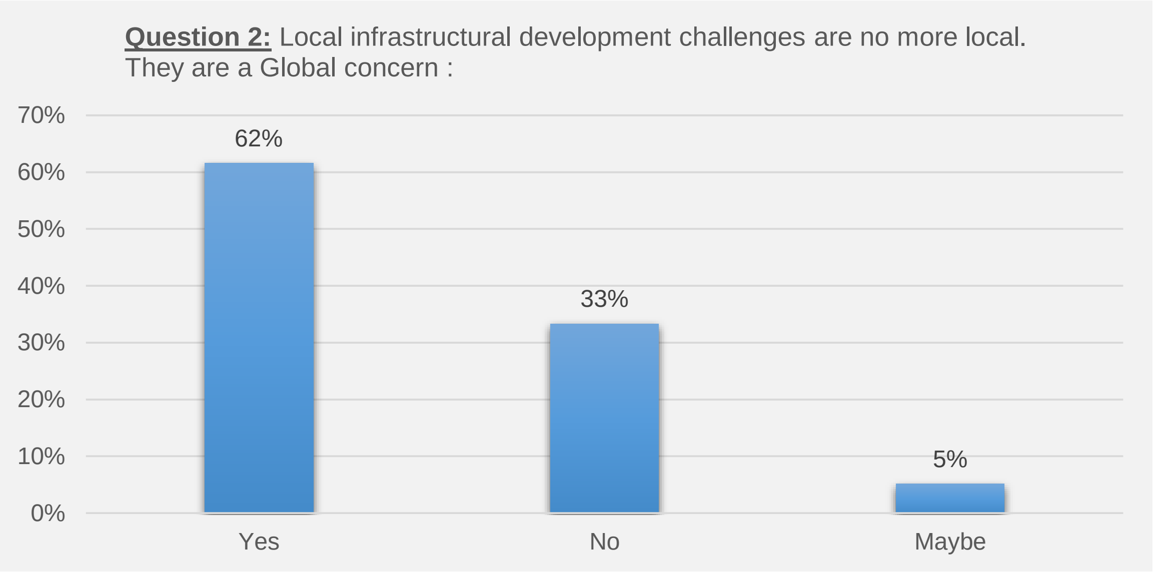
Reduction of GST from 18% to 12% on infra projects has helped existing ongoing projects

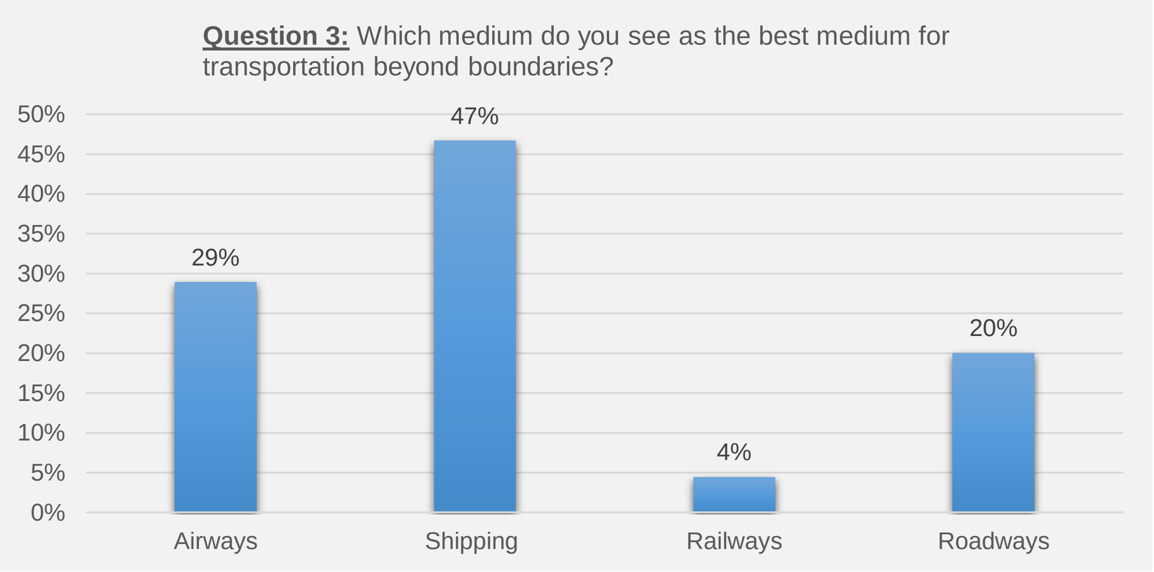
Future Recommendations

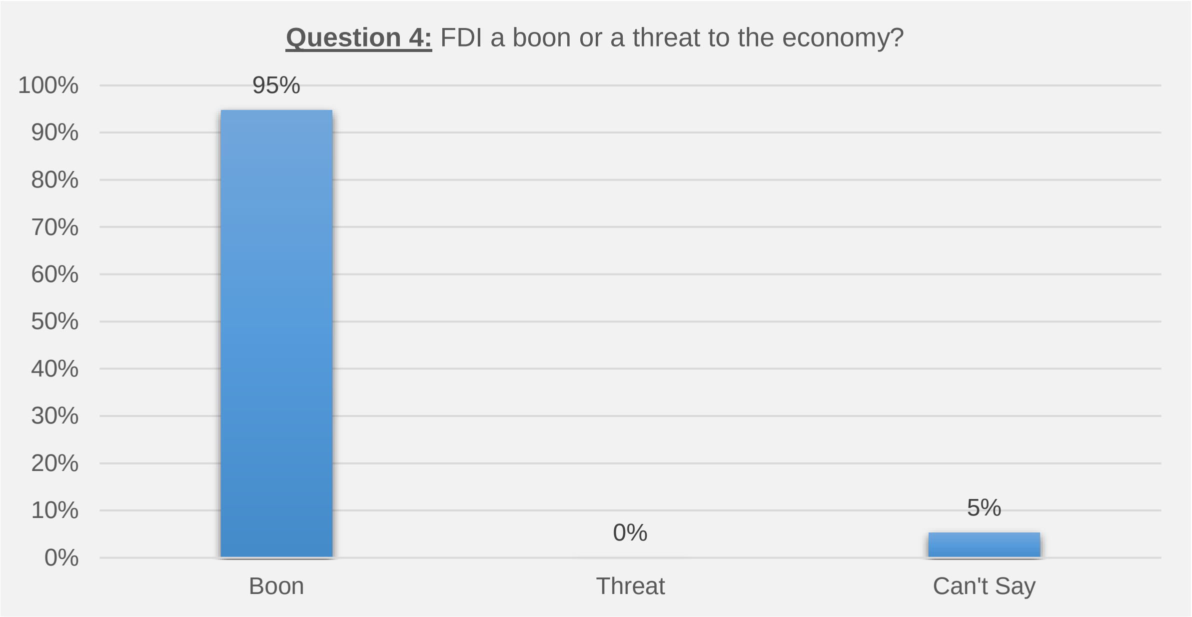
There is a need for a forum where government, banks and other funding agencies and infrastructure developers to discuss the core issues around funding.

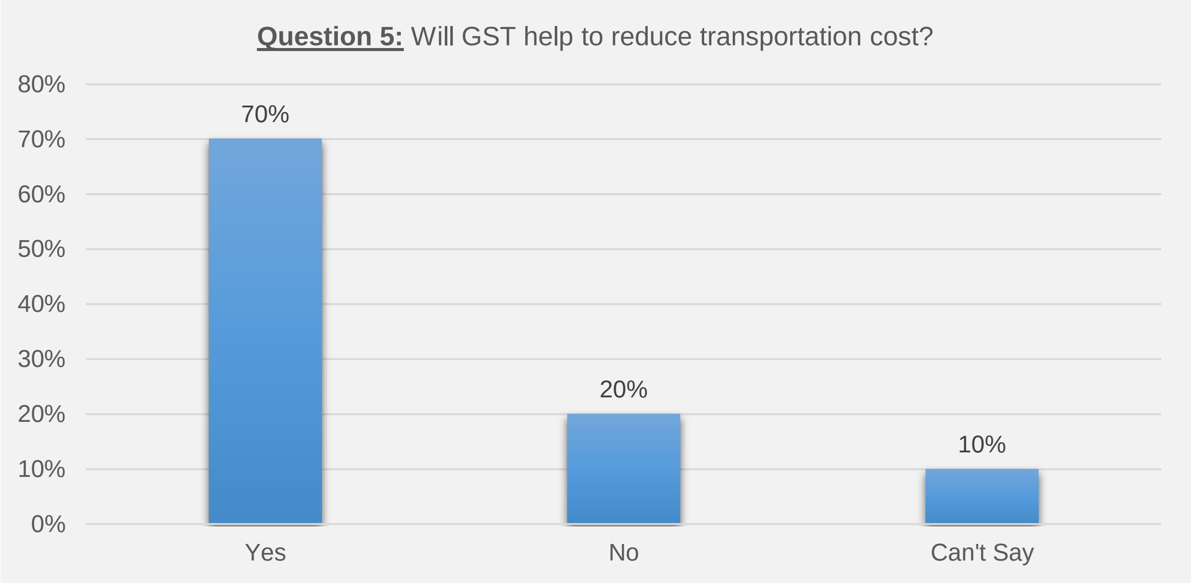
Audience poll results




Question 2: Local infrastructural development challenges are no more local. They are a Global concern :
70%
60%
50%
40%
30%
20%
10%
0%
62%
33%
5%
Yes
No
Maybe


Question 3: Which medium do you see as the best medium for transportation beyond boundaries?
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
29%
47%
4%
20%
Airways
Shipping
Railways
Roadways


Question 4: FDI a boon or a threat to the economy?
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
95%
0%
5%
Boon
Threat
Can't Say


Question 5: Will GST help to reduce transportation cost?
80%
70%
60%
50%
40%
30%
20%
10%
0%
70%
20%
10%
Yes
No
Can't Say

<u>Question 6:</u> The mega projects in India (developed within last one year or being developed in next 5 years) are trend setting and demonstrate India's capabilities?