



Road Infrastructure Sector Study

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Road Infrastructure

Global Overview | Infrastructure

- A good infrastructure is important for faster economic growth and alleviation of poverty. The adequate infrastructure in the form of roads and railway transport system, ports, power, airports and their efficient working is essential for integration of any country with other economies of the world.
- According to Asian Development Bank (ADB) Report, Asian countries would be required to invest USD~26,121bln in their infrastructure to meet the demand of growing population in the region. As mentioned in the table below, among Asian countries, China investment in infrastructure projects is expected to be significantly higher than other regional countries.

Infrastructure Investment by Region , CY16-CY30 (USD bln CY15 prices)						
Region/ Subregion	Baseline Estimates			Climate Adjusted Estimates		
	Investment Needs	Annual Average	Investment Needs as % of GDP	Investment Needs	Annual Average	Investment Needs as % GDP
Central Asia	492	33	6.8	565	38	7.8
East Asia	13,781	919	4.5	16,062	1,071	5.2
China	13,120	875	5	15,267	1,018	5.8
South Asia	5,477	365	7.6	6,347	423	8.8
India	4,363	291	7.4	5,152	343	8.8
Southeast Asia	2,759	184	5	3,147	210	5.7
Indonesia	1,108	74	5.5	1,229	82	6
Total	22,509	1,501	8.2	26,121	1,742	9.1

Road Infrastructure

Global Overview | Road Infrastructure

- Road infrastructure refers to all physical assets within the road reserves, including not only the road itself, but all associated furniture (signage etc.), all earthworks, drainage and structures (culverts, bridges, buildings etc.).
- Roads make a crucial contribution to economic development & growth. In addition, providing access to employment, social, health and education services makes a road network crucial in fighting against poverty. Roads open up more areas and stimulate economic and social development. For these reasons, road infrastructure is the most important of all public assets.

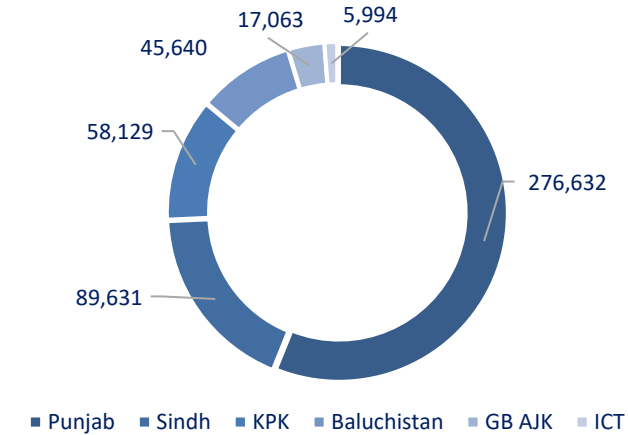
Infrastructure Investment Needs by Sector, 2016-2030 (\$ billion in 2015 prices)							Average Economic Internal Rate of Return of ADB-Financed Projects (1966–present)		
Sector	Baseline Estimates			Climate-adjusted Estimates			Sector	Number of Projects	EIRR (%)
	Investment Needs	Annual Average	Share of Total	Investment Needs	Annual Average	Share of Total			
Power	11,689	779	51.8	14,731	982	6.76	Transport	215	18
Transport	7,796	520	34.6	8,353	557	6.56	Air transport	11	14
Telecommunications	2,279	152	10.1	2,279	152	5.12	Road Transport	184	23
Water and Sanitation	787	52	3.5	802	53	3.31	Rail Transport	20	16
Total	22,551	1,503	100	26,166	1,744	1.02	Water	38	20
							Power	33	33
							Telecommunications	17	24
							Total	303	22

Road Infrastructure

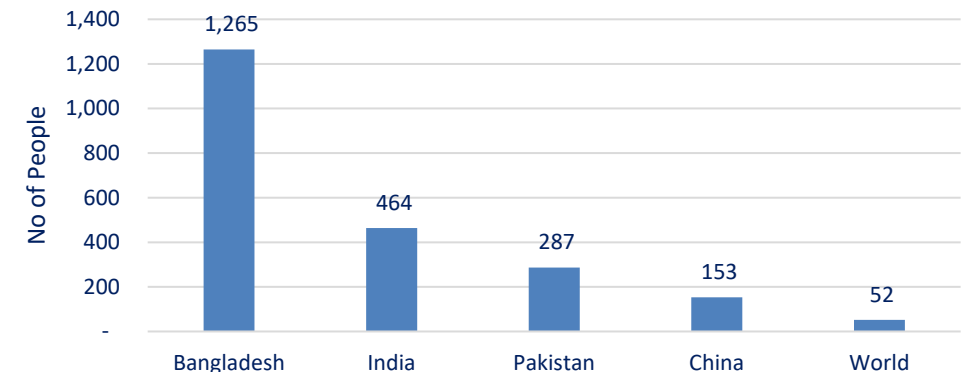
Local Industry | Snapshot

- The transport sector in general and road infrastructure, in particular, have a profound and enduring effect on the economic growth of Pakistan.
- National Highway Authority (NHA) is playing a vital role in improving the productivity and competitiveness of businesses and the quality of travel with an emphasis on safety.
- Roads are the main mode of transportation in Pakistan, accounting for ~96% of all inland freight and ~92% of all passenger traffic.
- The motorway and highway network comprises less than ~2.4% of the total road length, but caters to about ~80% of the country's total traffic.
- As per latest report of National Transport & Research Center (NTRC), the total road length of Pakistan is around ~493,089 km as of March-2020. Among provinces, Punjab has the highest share as it constitutes ~56% of the country's total road length followed by Sindh, KPK, Baluchistan, AJK & GB and ICT having ~18%, ~12%, ~9%, ~3% and ~1% share, respectively.

Pakistan Road Length March-2020 (km)



Population Density/km Sq.



Road Network

- Federal roads are controlled by the Government of Pakistan and maintained by NHA. They are divided into 3 classes:
 - Motorways
 - National Highways
 - Strategic Highways
 - Expressways
- NHA was created in 1991 through an Act of the Parliament for planning, development, operation, repair and maintenance of National Highways, Motorways and Strategic Roads entrusted to NHA by the Federal Government or by a Provincial Government or other authority concerned.
- NHA is the custodian of 39 national highways/ motorways/ expressway/ strategic routes having a total length of ~11,995 km. It is ~2.4% of total national roads network (493,089 km). However, it carries ~80% of the commercial traffic and N-5, connecting Karachi to Torkham, which is the blood-line of Pakistan, carries 65% of this load in the country.

Road Infrastructure

Road Network | Motorways

- Motorways of Pakistan are a network of multiple-lane, high-speed, limited-access or controlled-access highways that are owned, maintained and operated federally by NHA. As of March-2020 total length of Motorways in Pakistan stood around 1,973 kms.

Major Motorways			
Name	Course	Length	Status
M-1	Peshawar– Islamabad	155 km	Operational
M-2	Islamabad – Lahore	367 km	Operational
M-3	Lahore – Abdul Hakeem	230 km	Operational
M-4	Pindi Bhattian – Multan	309 km	Operational
M-5	Multan – Sukkur	387 km	Operational
M-6	Sukkur – Hyderabad	296 km	Under Consideration
M-7	Dadu-Hub	270 km	Proposed
M-8	Ratodero – Gwadar	892 km	Partially Operational Under Construction
M-9	Hyderabad – Karachi	136 km	Operational

Road Infrastructure

Road Network | National Highways

- National Highways of Pakistan consist of all public highways maintained by NHA. The total length of national highways in Pakistan is over 9,500 kms. The highways transverse across the country and provide access to major population centers. Total number of highways are 26.

Major National Highways			
Name	Course	Length (km)	Status
N-5	Karachi – Torkham	1,819	Operational
N-25	Karachi – Chaman	813	Operational
N-35	Hasan Abdal – Khunjerab Pass	806	Operational
N-10	Karachi – Gwadar	653	Operational
N-40	Quetta – Taftan	610	Operational
N-50	Kuchlak – Dera Ismail Khan	531	Approved
N-45	Nowshera – Chitral	309	Proposed
N-15	Mansehra – Chilas	240	Partially Operational Under Construction
N-30	Basima – Khuzdar	110	Operational

Road Infrastructure

Road Network | Strategic & Express Highways

Strategic Highways:

- National Highways are distinct from 'Strategic Highways'. These are controlled and operated by the Ministry of Defence. Following highways have been characterized as strategic highways in the country.

Strategic Highways			
Name	Course	Length (km)	Status
S-1	Gilgit – Skardu	167 km	Operational
S-2	Kohala - Muzaffarabad	40 km	Operational
S-3	Muzaffarabad - Chakothe	55 km	Operational

Expressways:

- Expressways are also a network of multiple-lane, high-speed toll highways in Pakistan, which are owned, and maintained by the NHA. Expressways are usually upgraded versions of National highways but differ from Motorways because of less access restrictions. Total number of expressways in the country are 11. The total length of expressways in Pakistan's is ~260 kms.

Road Infrastructure

Road Network | CPEC Projects

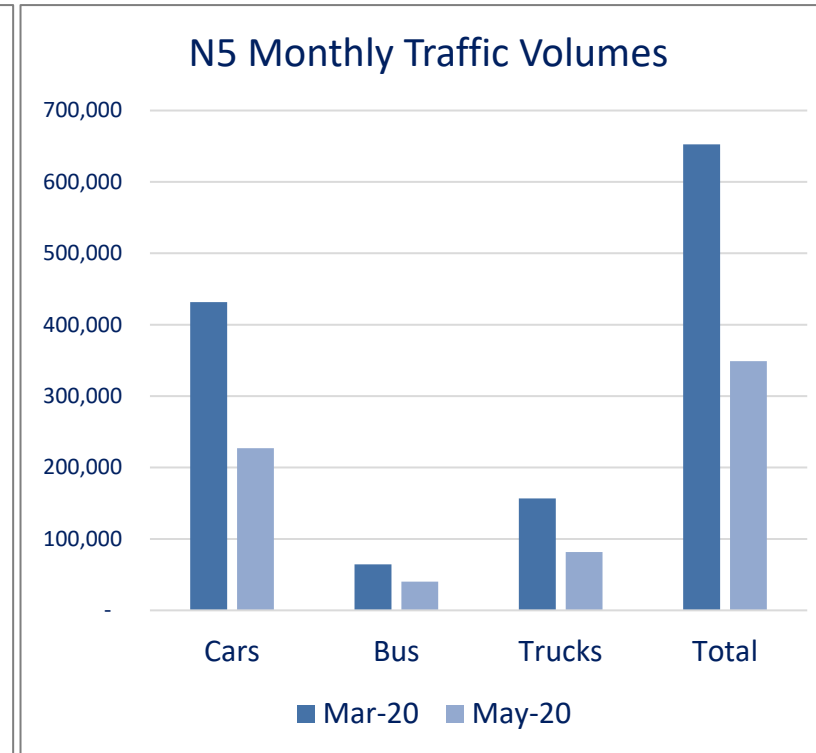
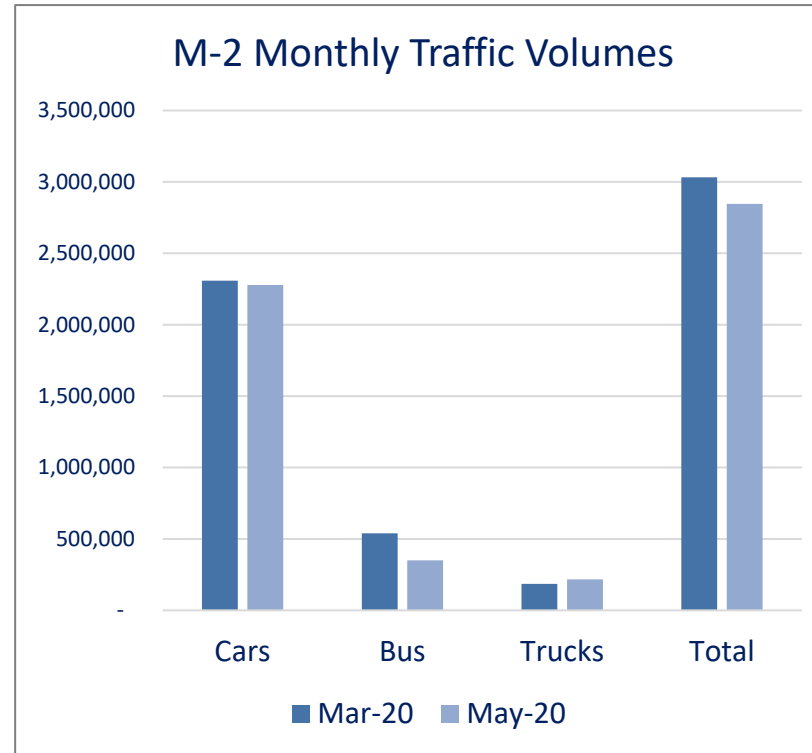
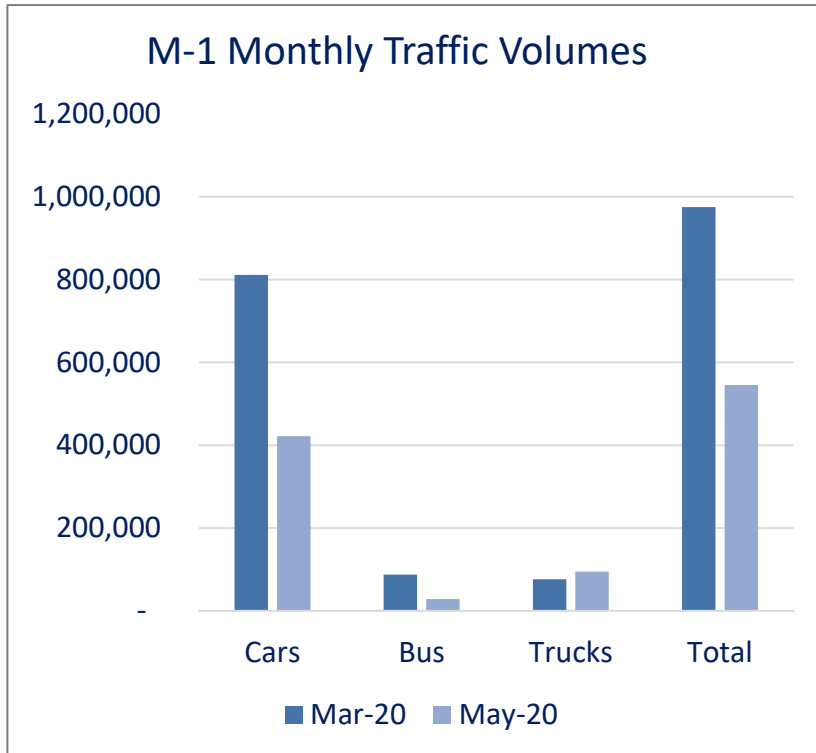
- Construction activity of CPEC projects has increased in the current year. Following are the upcoming projects under CPEC Authority:

Upcoming Projects			
Name	Course	Length (km)	Status
M-8	Hoshab-Awaran	400 km	Under Construction
N-50	Zohb-Quetta	331 km	Under Construction
M-6	Sukkur-Hyderabad	296 km	In Approval Stage
N-50 Phase-I	Upgradation of D.I.Khan (Yarik) - Zhob	210 km	In Approval Stage
N-35	KKH Thakot-Raikot (Remaining Portion)	136 km	In Approval Stage
N-30	Khuzdar-Basima Road	110 km	Under Construction
Total		1,347 km	

Road Infrastructure

Traffic Volumes

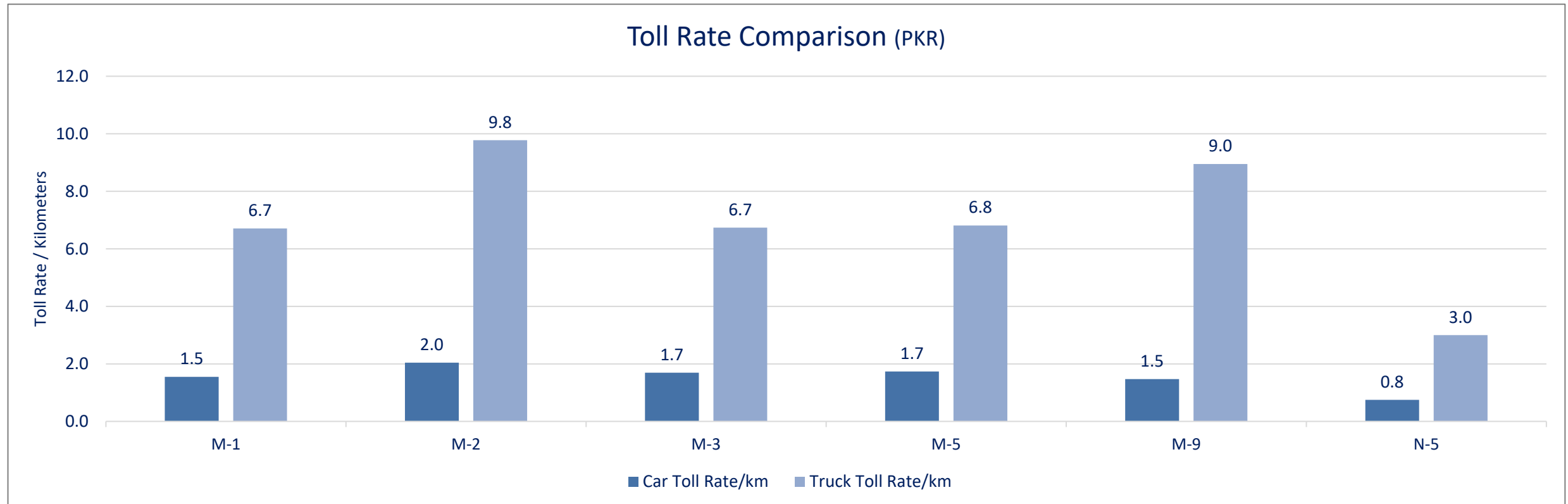
- National highways and motorways carry ~80% of the country traffic volumes. M-2 connects Lahore with Islamabad and is one of the busiest motorways in the country with a monthly car traffic volume of above ~2mln.
- Due to the COVID-19 lockdown, the traffic volumes decreased in May-2020 in contrast to March-20. The volumes recovered significantly after the lock down.



Road Infrastructure

Toll Rates

- Car traffic has the highest portion in the overall traffic on motorways as the people travelling on private cars usually prefer motorways due to high-speed limit and better paved roads as compared to national highways. National highways have major chunk of commercial traffic. As the toll rates on national highways are considerably lower than motorways, trucks usually prefer travel through the former.



Road Infrastructure

Operating Model

- Major motorways and highways in Pakistan function on Built Operate and Transfer (BOT) basis. It is a mechanism through which private sector is made responsible to arrange financing for the project. The private sector partner bears the responsibility of design, construction, operation and maintenance of the project and in return, they are authorized to receive toll/other revenue for a certain period (in line with rate of return of the project).
- Under PPP/BOT (Public Private Partnership/ Built Operate Transfer) arrangement, through competitive bidding a successful bidder is selected. The selected bidder then incorporates a Project Company to perform as Special Purpose Vehicle (SPV). A Concession Agreement is signed with the Project Company. The project details are firmed up in the Concession Agreement that includes, inter alia, the accepted bid parameters, scope of work, concession period and other details deemed necessary for implementing the project under PPP/BOT arrangement. Some of the major projects operating under this mechanisms are:

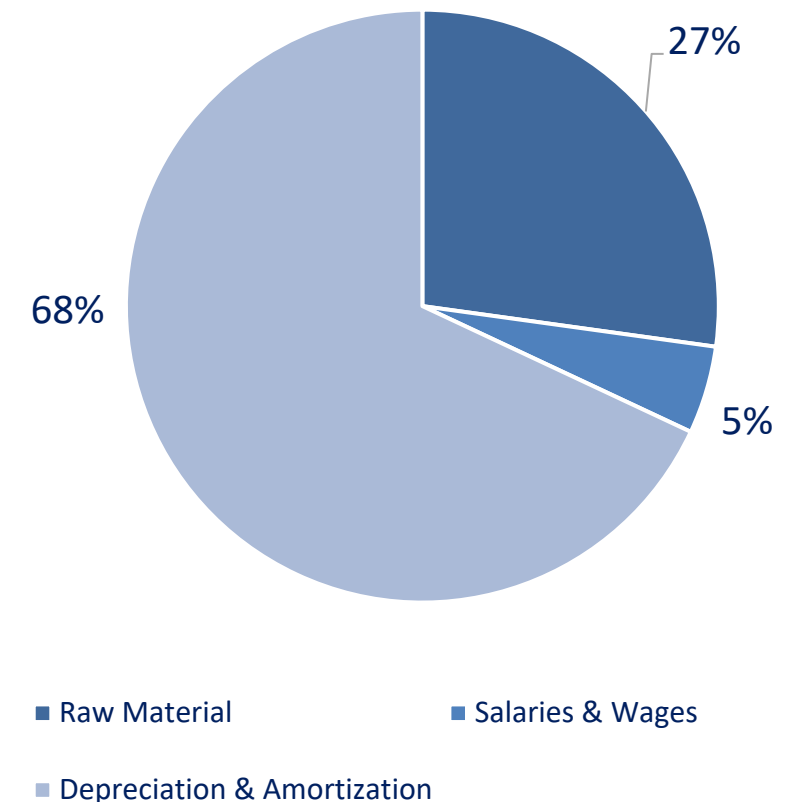
Project	Special Project Company	Length (km)	Parent Company	Model
M2- Lahore Islamabad	MORE- Motorway Operation and Rehabilitation Engineering (Private) Limited.	357	FWO Frontier Works Organization	Build Operate Transfer
M9- Karachi Hyderabad	SCORE- Superhighway Construction Operation and Rehabilitation Engineering (Private) Limited.	136	FWO Frontier Works Organization	Build Operate Transfer
Connecting N5-N55	GKRBC-Ghotki Kandhkot Road & Bridge Company (Pvt.) Limited	109	Sachal Engineering Works (Pvt.) Limited (SEWPL),	Design Finance Build Operate Transfer
M11- Lahore Sialkot	LSMIM-Lahore Sialkot Motorway Infrastructure Management (Private) Limited	89.2	FWO Frontier Works Organization	Build Operate Transfer
Swat Expressways	SEPCO- Swat Expressway Planning Construction and Operations	160	FWO Frontier Works Organization	Build Operate Transfer

Road Infrastructure

Business Risk

- The sector's revenue growth depends upon two factors, increase in toll rates and volumetric increase in traffic count for existing projects. Revenue of the sector has shown an upward trend due to gradual increase in traffic volumes and upward revision of toll rates. NHA revenue from Highways reflected a CAGR of ~7.1% sine CY13.
- Other source of revenue is rent from service stations but its proportion in total sector revenues remains around ~8%-10%.
- There is minimal revenue risk as traffic patterns are predictable and growing in Pakistan. But in some cases, if the stipulated increase in toll rates is not implemented or there is any downward revision, certain concessions are made by the government, but this has to be stipulated in the underlying contract to take effect.
- A wide variety of materials are used in the construction of roads. These include soils (naturally occurring or processed), aggregates (fine aggregates or coarse aggregates obtained from rocks), binders like lime, bituminous materials, and cement, and miscellaneous materials used as admixtures for improved performance of roads under heavy loads and traffic.
- For completed projects, the proportion of material cost reduces, while the fixed cost constitutes major portion of the total cost. Considering the low variability of the operational cost, the business risk of the companies operating the completed project decreases substantially. Maintenance and repair costs comprise major operational costs as per the agreement terms.

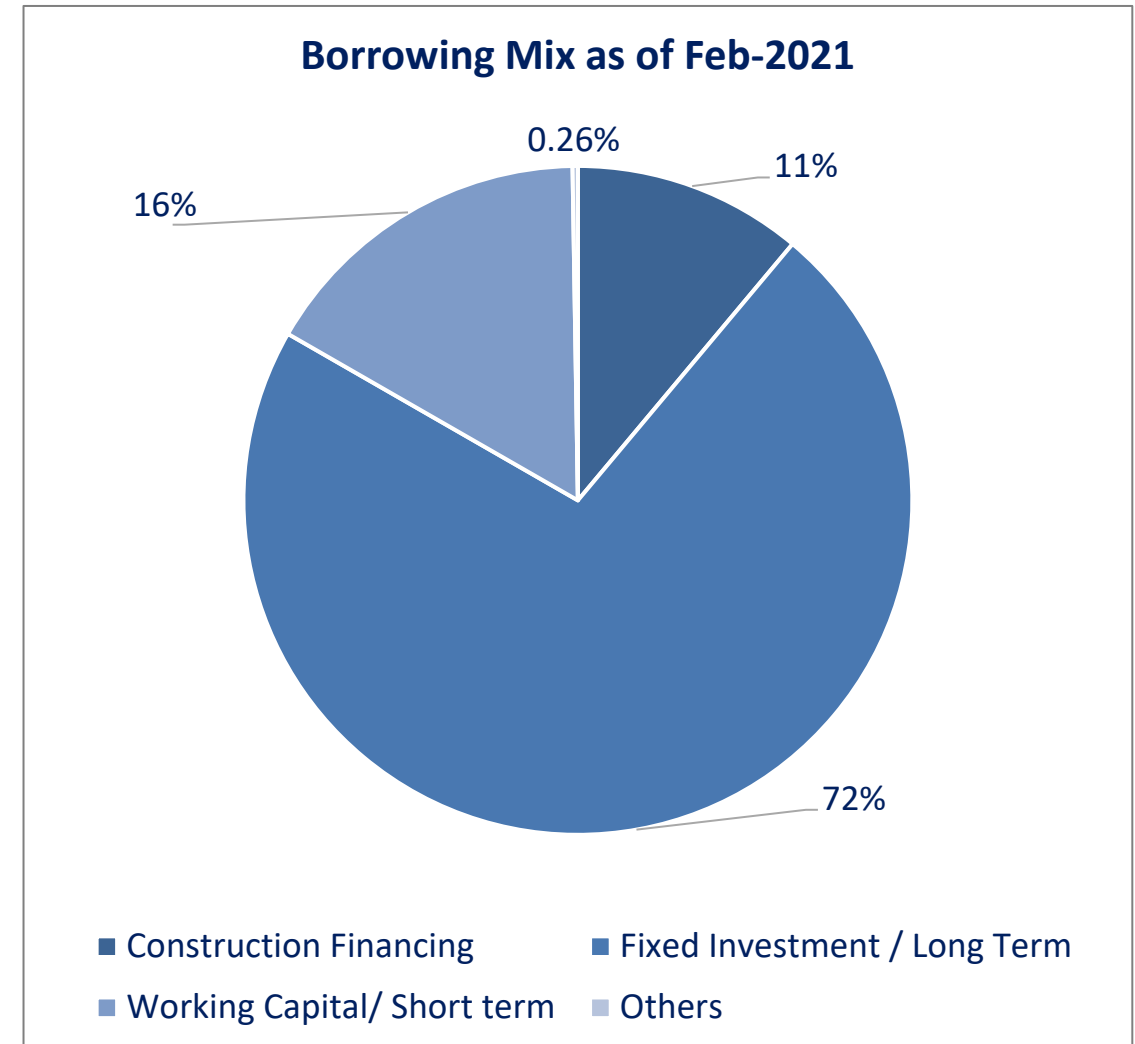
Cost Break-up of Completed Projects



Road Infrastructure

Financial Risk

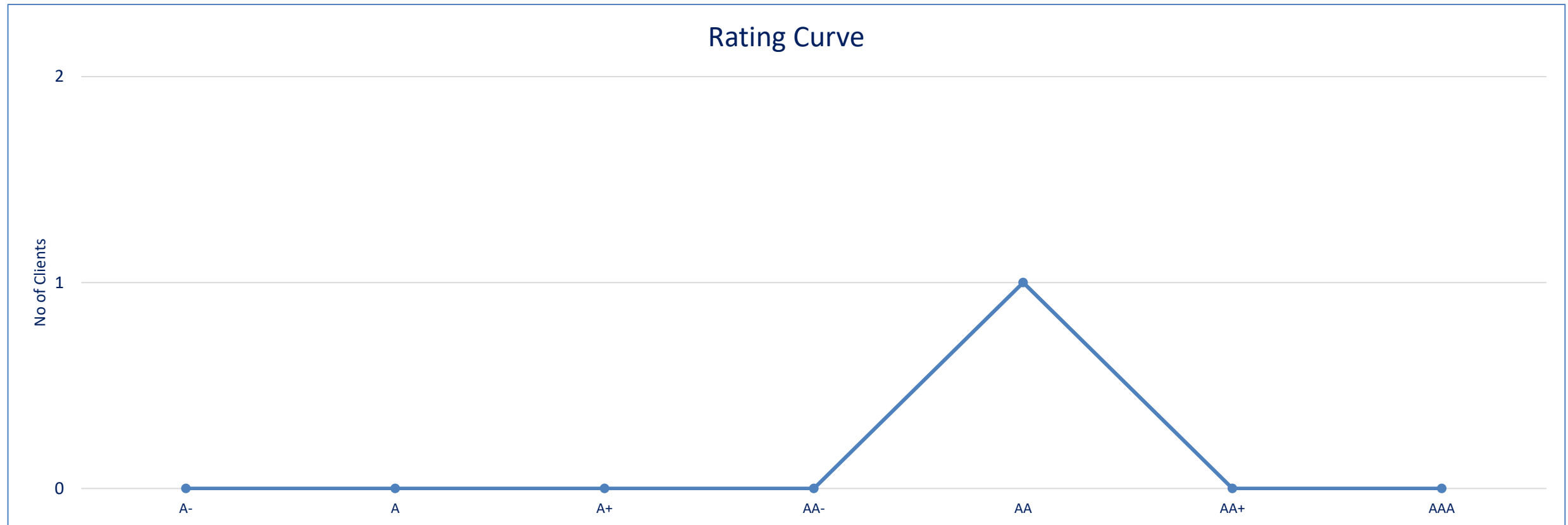
- The projects built under PPP mechanism are largely debt driven, wherein the mix of local and international debt is used. After the completion of the project, companies pay off their debt over the period agreed with the lenders. Debt repayments are aligned with expected revenue inflows after project completion. Delay in project completion can lead to situations where certain debt repayments set in before commencement of operations.
- As of Feb-2021, total debt of the sector stood at PKR~30,013mln (Feb-2020: PKR~47,826mln) with a YoY decline of ~59%. Continuous debt repayments by companies handling operational projects resulted in reduction in total debt of the sector.
- The sector is characterized by low working capital days. The nature of the business leads to minimum inventories held and very low receivable days as companies instantly receive toll from the vehicles crossing from toll plazas.



Road Infrastructure

Rating Curve

- PACRA rates 1 company, Motorway Operations and Rehabilitation Engineering (Pvt.) Limited (MORE), in the Road Infrastructure sector.
- The rating of the company is AA/A1+.



Road Infrastructure

SWOT Analysis



Road Infrastructure

Outlook: Stable

- The sector drives strength from its stable business model. Strong road infrastructure is considered important for economic growth as it brings efficiency to all other sectors of the economy by cutting down transportation cost and increased connectivity.
- Historically, traffic volumes have shown as an increasing trend. During COVID-19 lock down, traffic volumes decreased, which recovered in late CY20 and early CY21. However, the recent rise in COVID-19 cases and resultant lock down can impact volumes in the near term. In the medium to long term, improved road networks and lack of alternate means of transportation for the masses, bodes well for the sector.
- Moreover, the expected increase in traffic volumes due to CPEC related activity will exponentially increase the capacity utilization of the country's motorways and highways.
- Cost structure of the completed projects is usually characterized by fixed cost whereas, for the projects under construction, the timely completion is essential to stop cost overruns and keep projects afloat.
- Considering strategic importance of each route, the competition amongst different road projects is very minimal and hence further adds to the strength of the sector's business model.

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