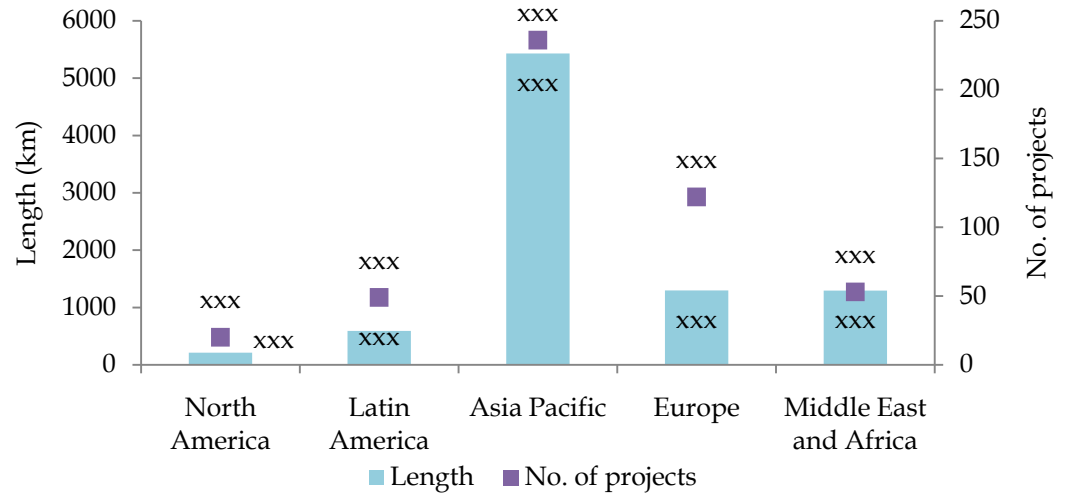


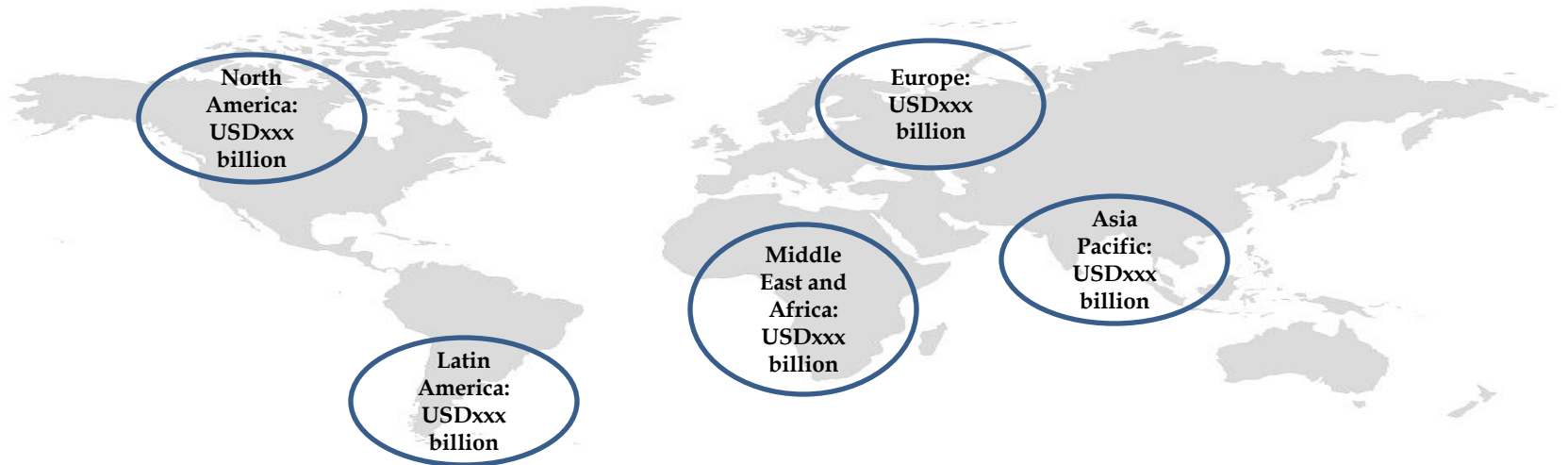
1.1 Overview (1/3)

The report covers 480 upcoming metrorail, rapid transit, subway, mass rapid transit (MRT) projects in five regions, namely, North America, Latin America, Asia Pacific, Europe, and Middle East and Africa. These projects together cover a network of over 8,826 km and require an estimated investment of more than USD923 billion.

Region-wise no. and length of projects



Region-wise total upcoming investment



1.1 Overview (3/3)

Huge investments are planned to be undertaken in construction, fare systems, rolling stock and signalling, train control, and telecommunications (STT) systems.

Construction

New build projects: USDxxx billion to USDxxx billion

Extensions and modernisation: USDxxx billion to USDxxx billion



Rolling stock

Between USDxxx billion and USDxxx billion



Fare system

USDxxx billion



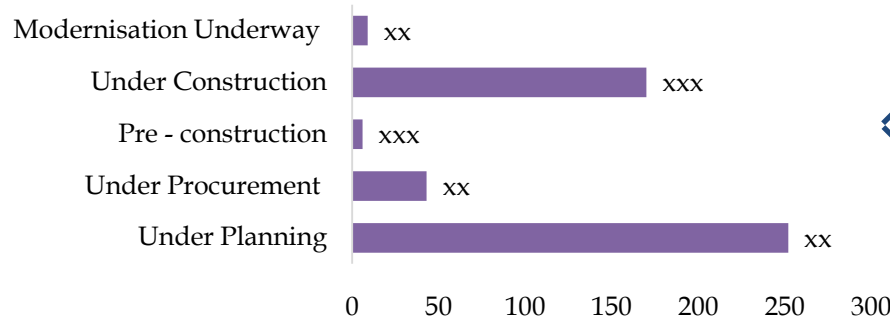
STT

USDxxx billion



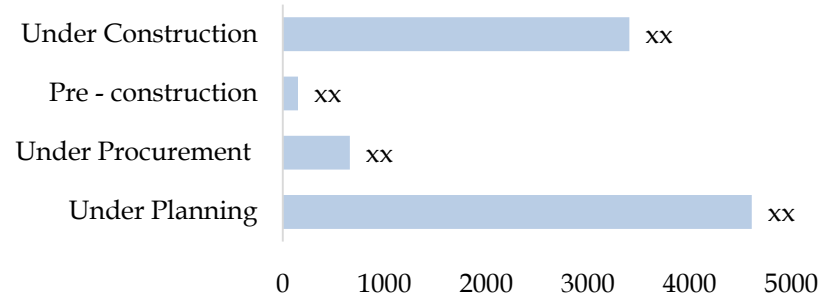
1.3.1 Introduction

Distribution of number of projects by status



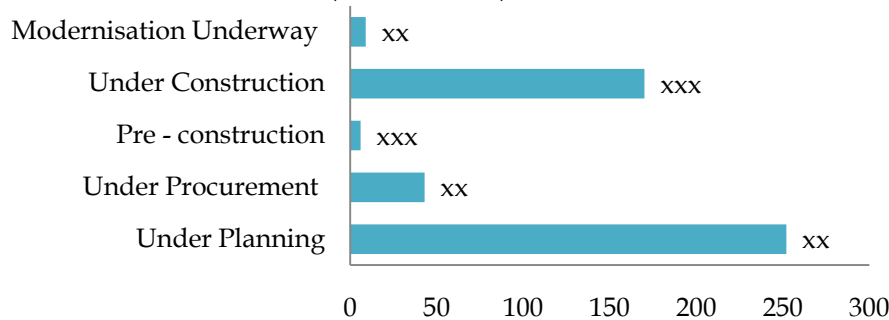
Of the 480 projects, around xx% are in the planning phase, representing significant investment opportunities for contractors/service providers across the urban rail transit value chain.

Distribution of length of projects by status (km)



Of the 480 projects spanning xx km the ones under planning together span more than xx km, which accounts for around xx% of the total length.

Distribution of cost of projects by status (USD billion)



A total of around USDxx billion is planned to be invested in public transport infrastructure. Of this, around xx% of the projects are in the planning stage and around xx% are under construction.

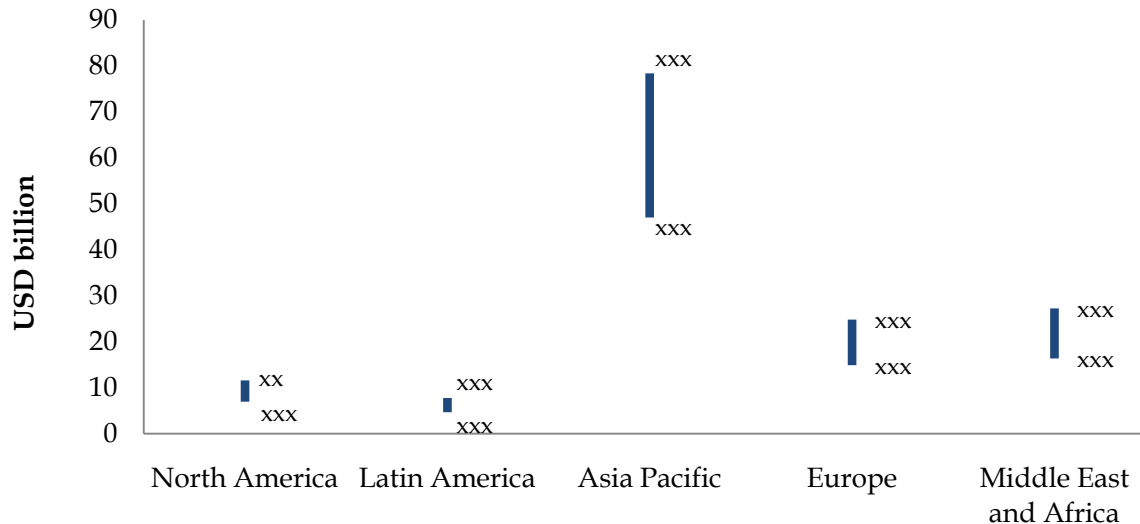
1.4.2 Analysis of rolling stock

Of the 480 projects covered in the report, contracts have been awarded for around xx projects, while *contracts for xxx projects are yet to be awarded*. Information for xx projects is either not available or not applicable.

Region-wise no. of projects with contracts award status

	Contracts to be awarded	Contracts awarded
North America	13	6
Latin America	41	4
Asia Pacific	182	46
Europe	81	36
Middle East and Africa	37	16

Region-wise estimated value of contracts to be awarded

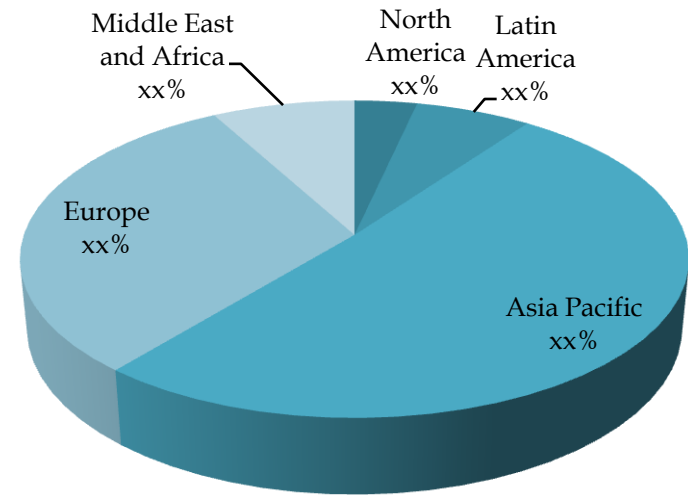


Contracts worth USDxxx billion to USDxxx billion for these xxx projects are yet to be awarded.

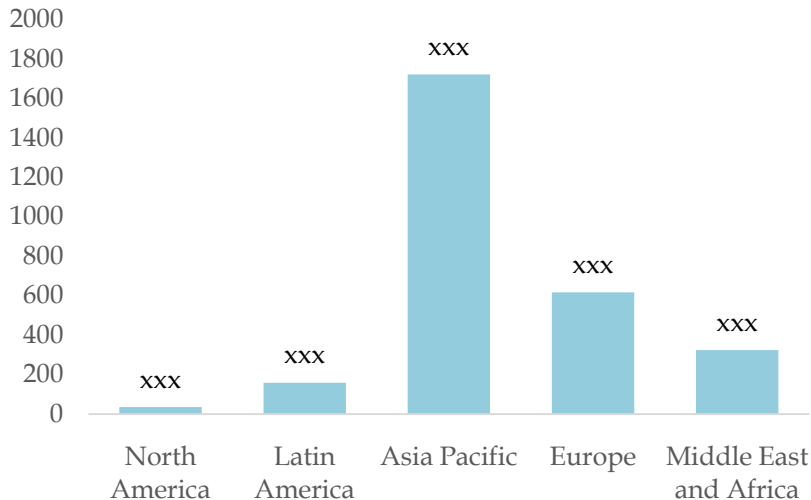
1.5.2 Underground rail projects

- Underground alignment is typical for metro rail projects which have higher operating speeds and bigger budgets.
- The largest share of upcoming metro rail projects with underground alignment is planned in xx, followed by xx and the xx.
- Of the 480 upcoming projects covered in the report, information on planned length was available for xxx projects. Of these, xxx projects will be partially or completely underground, covering a network of more than xxx km.

Share of planned projects with underground alignment by region (by number of projects)



Planned projects with underground alignment by region (by length)

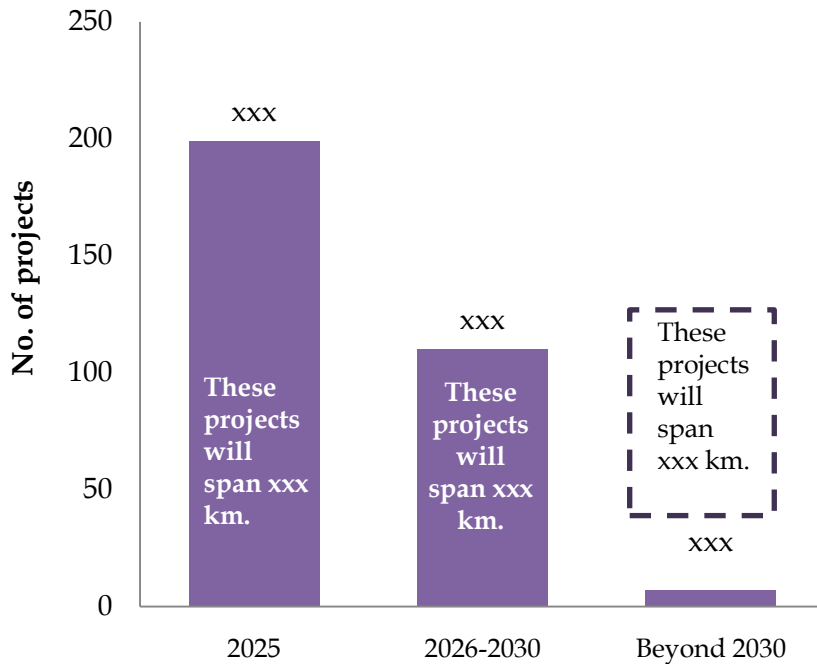


- Asia Pacific presents the largest opportunity for tunnelling players, with more than xxx km of underground rail lines planned. This is over double the length planned in the Europe, which has the next highest share.

- xxx

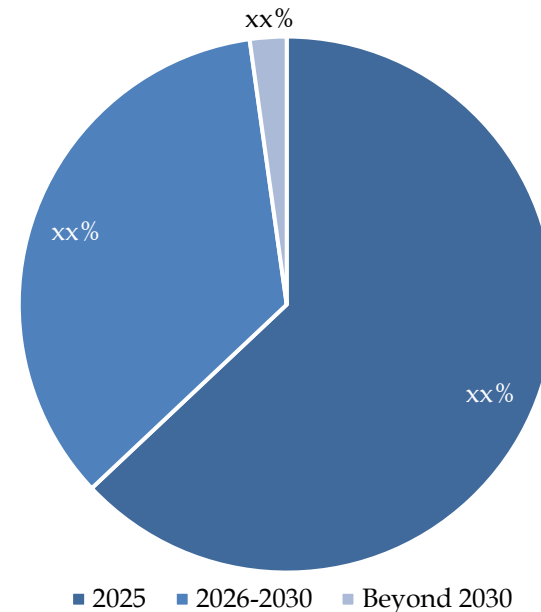
1.6.1 Introduction

Projects by expected date of completion



A total of xxx projects, spanning over xxx km, are expected to be developed and modernised by 2025; xxx projects spanning around xxx km are planned to be operationalised and modernised during 2026-2030; and xx projects spanning over xxx km will be developed and modernised beyond 2030.

Distribution of projects by expected date of completion*



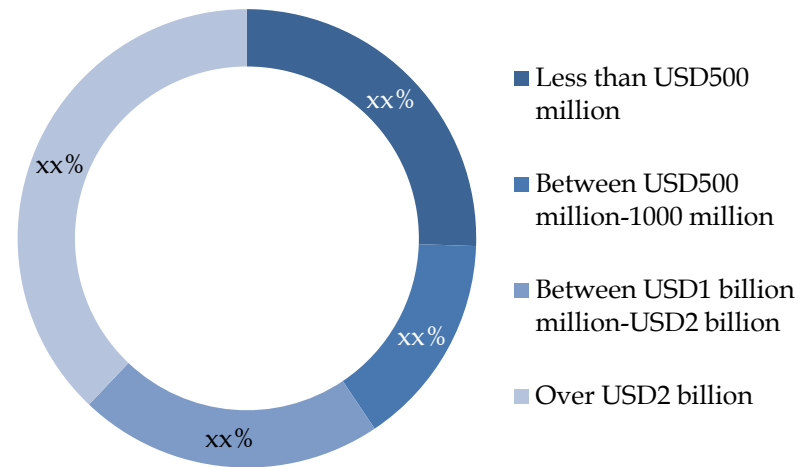
The report covers 480 projects, of which the completion dates for xxx projects are available. Of these, xx% of the projects are expected to be completed by 2025; xx% are expected to be completed during 2026-30, and xx% will be completed after 2030.

Note: Out of 480 projects, completion dates for 159 projects are to be announced and 5 projects are not available.

1.7.1 Introduction

- The report covers 480 projects. Of these, xx projects spanning around xxx km, will require investment of less than USD500 million each.
- A total of xxx projects, spanning around xx km, will require investment ranging between USD500 million and USD1 billion each.
- Further, xx projects, spanning around xx km, will require investment ranging between USD1 billion and USD2 billion each.
- Finally, a total of xx projects, spanning around xx km, will require investment of more than USD2 billion each.

Share of no. of projects by cost*



Projects with highest investment requirement by region

Region	Project	Cost (USD billion)	Length (km)	Expected year of completion
North America	xxx	xxx	xxx xxx	
Latin America	xxx	xxx	xxx xxx	
Asia Pacific	xxx	xxx	xxx xxx	
Europe	xxx	xxx	xxx xxx	
Middle East & Africa	xxx	xxx	xxx xxx	

Some of the largest projects, in terms of cost, involve development of new lines and systems.

Note: *The planned investments for xx projects are not available and for xx projects are yet to be announced.

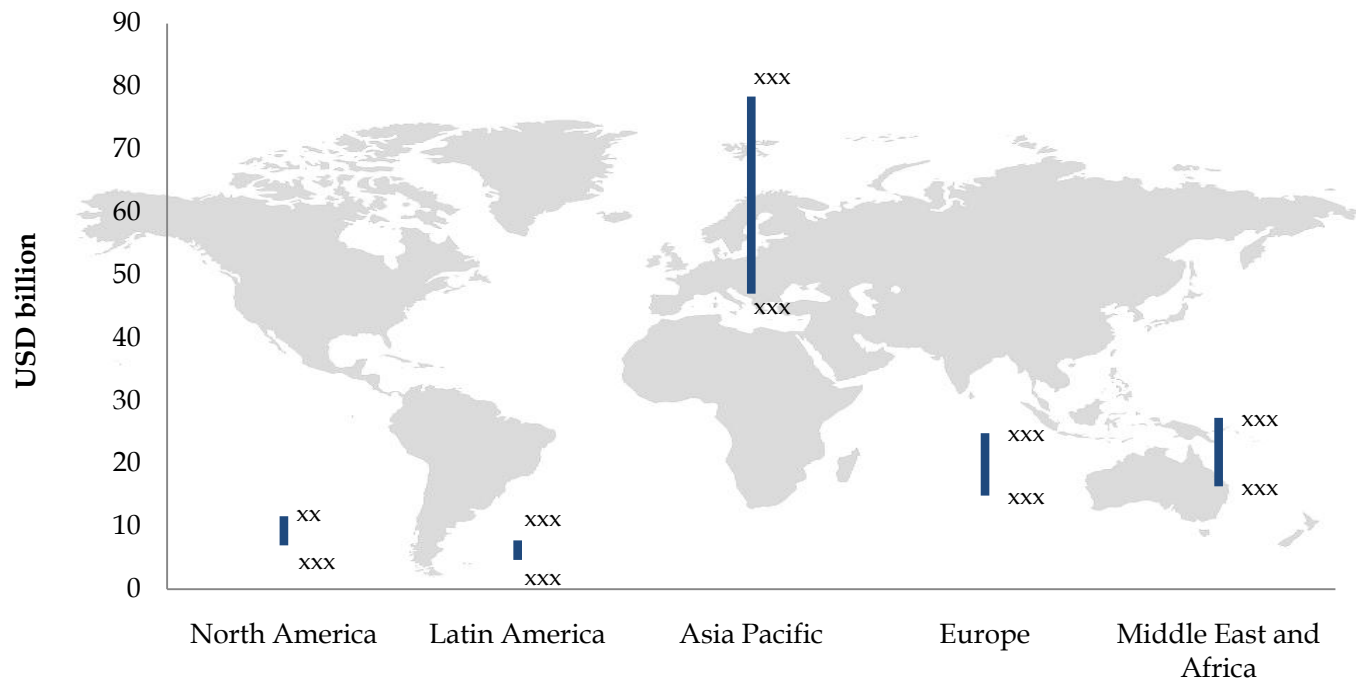
Note: **xxx

1.9.1 Expected investment in new build projects

An estimated USDxxx billion is planned to be invested globally in the development of new lines or systems globally. Majority of these investments are in the Asia Pacific, followed by the Middle East and Africa.

- Depending upon the type of project, the construction cost as a percentage of the total project cost (TPC) ranges between 40-55%.
- An estimated **USDxxx billion to USDxxx billion** is planned to be invested in the construction of new lines and systems.

Region-wise planned investment in construction of new build projects



1.9.5 Expected investment in fare systems

The market size of planned fare system deployment is estimated to be USDxx billion. Globally, cost of deployment of fare systems as a percentage of the total project cost (TPC) is estimated to be 3%.

Region-wise planned investment in fare systems

NORTH AMERICA: USDxxx billion

Mobile ticketing is gaining traction in the region. According to reports, public transport users are among the 75-80% of Americans who own smart phones. Transit agencies in Chicago, Portland (OR), New York, Boston, Dallas and other U.S. cities are implementing fare systems that support contactless open payments.

EUROPE: USDxxx billion

Besides contactless smartcards, mobile ticketing and bank cards are the most popular fare media planned to be deployed.

ASIA PACIFIC: USDxxx billion

Agencies are making efforts to improve the passenger experience using bank cards. For instance, taps on transit systems from payment cards linked to smart phones increased over time.

LATIN AMERICA: USDxxx billion

In the next decade, the region's card and payment industry is expected to grow at an substantial rate. Acquirers and agencies have shown a willingness to integrate transit payments with other non-transit payments.

MIDDLE EAST AND AFRICA: USDxxx billion

Smartcards and paper tickets will continue to dominate the fare payment industry. Only Dubai plans to introduce bank cards and has tied up with Mastercard to launch bank cards, while Doha has plans to introduce ABT in 2020.



1.13.2 Impact of COVID-19

Global Maas Transit estimates that around xxx projects, spanning over xxx km, which were originally planned to be operationalised during 2020-2023, may now face delay due to the on-going COVID-19 pandemic.

Projects to be completed during 2020-2023

Region	Number of projects	Length (km)	Investment (USD billion)
North America	xxx	xxx	xxx
Latin America	xxx	xxx	xxx
Asia Pacific	xxx	xxx	xxx
Europe	xxx	xxx	xxx
Middle East and Africa	xxx	xxx	xxx

Factors responsible for delay

Losses to transit agencies

Some authorities have now suspended fare collection. Declining ridership and shrinking revenue from restricted operations will affect the financial well-being and solvency of transport authorities across the globe. For instance, in the US, fares contribute to an average of 32% of transit operations according to the US Department of Transportation. In the case of New York, MTA has estimated USD6.5 billion in fares for the year 2020 from the total allocated budget of USD17 billion. A fall of even 8% in ridership would lead to a shortfall of USD520 million. This implies that most transit agencies in the US will need substantial financial support to continue the level of service once travel restrictions in US cities are lifted. Without financial support, loss in revenue will lead to large cuts in services, and all expansion plans may be put on hold.

Multilateral loans

China has made huge investments in rail infrastructure projects in several regions. For instance, in Africa, during 2000-2014, the country made investments worth USD24.2 billion to finance transportation projects. Of these, around 80% (USD19.36 billion) was invested in rail and road projects. During 2015-2019, Nigeria and Angola received investments worth USD14.9 billion and USD2 billion respectively from China for the development of transport network, including rail.

However, given the fact that China was the point of origin of the recent COVID-19 pandemic, and that consequently the Chinese economy has suffered considerable losses in recent months, has raised questions about the future of projects in which Chinese contractors are involved.

Impact on project funding

Projects in several Middle Eastern countries depend highly on oil revenue. During the on-going pandemic, the oil revenues have declined considerably. This may lead to funding issues in several rail projects in the Middle East and Africa. Contract award for some projects is expected to be delayed, while some other projects may be stalled temporarily. Further, globally, tax revenue has declined and this will further aggravate the issues in project funding.