

## WBG Response to COVID-19

### The Transport Sector: A Mobility Crisis

(Note reflects data and developments as of April 2, 2020)

#### Executive Summary

The responses to COVID-19, from implementing social distancing to lockdown policies for affected areas, have huge implications for the mobility and connectivity of people and goods, the continuity of transport services, and therefore the entire sector. This will also have cumulative impacts on the economic activity of cities, regions, freight logistics, as well as related industries, markets and supply chains.

This crisis is being felt primarily in public transport and commercial aviation; and, as city, regional and country borders close, the impact on goods, services and production nodes will become more apparent with shortages of products, made worse by stock-piling. This negative demand shock is affecting all modes of transport.

- Mass transit. Passenger volumes are down substantially, both for traditional bus and urban rail services, as well as for ride-sharing platforms.
- Maritime transport. A significant percentage of container ships and trucking capacity is lying idle and freight prices are plummeting. Crew movements are constrained.
- Air transport. The market for passenger airline services has collapsed; leading also to a dramatic reduction in capacity for air freight capacity provided by passenger jets.

For example, social distancing has a very large impact on passenger transport services and particularly mass transit systems that are designed to move large numbers of people in dense urban areas. Restrictions on travel in affected cities and implementation of stay-home policies for workers in non-essential sectors have decreased demand for public transport services by 25 percent to 50 percent in many cities and operators have begun to cut services in response to the extraordinary circumstances. It is not yet clear if and how these changes in travel behaviors will be long-lasting, but public transport systems that tend to serve the poor and disadvantaged populations will be under additional financial stress from reduced fare revenues. In aviation, a decline of over 40 percent in global passenger traffic is expected in the near term and massive revenue losses may threaten the financial stability of many airlines. Construction projects and supply chains may also see significant delays due to the difficulty of mobilizing workers and equipment under travel restrictions.

Food supply chains could collapse due to the lack of transport to take products from farm to table. Food will continue to be produced in the short term, but might not be delivered on time, particularly to urban dwellers. This would endanger the nutrition of the bottom 40% who have lower ability to stock up food. Related, in many cities in developing countries, public transport is informal and privately owned. Bus owners and drivers earn income only if they carry passengers –taxi and shared-ride drivers are also in this category. These groups are therefore very vulnerable, aggravated by the informality of their business –a tax reduction will not benefit them.

In response, many transport services are either shutting down or scaling-back as routes are no longer viable. This raises concerns as to how minimal lifeline connectivity and mobility can be sustained to permit passenger travel for essential purposes, as well as protecting supply chains for imports of food, fuel, medical supplies and essential goods, and domestic distribution channels.

As a result, in the short- and mid-run, the provision of these services will likely be severely impaired due to financial distress of the operators. Most dramatically, it is predicted that some major airlines may be bankrupt by the end of May.

The social impact through and within the transport sectors will also be significant:

- Users will change their demand on mobility services either for concern on reducing the physical moves but also because they might be limited in how to pay for them (the economic shock will be important particularly for the self-employed –which ironically are the most dependent on day-to-day mobility, small businesses, etc.) In turn, transport services will become more expensive as additional actions will be demanded from providers to adjust services to “social distancing” protocols and likely –even if temporarily—face the need to have less “efficient use” of the space and facilities of transport services and urban spaces.
- Impact on mobility may be very asymmetric, disproportionately affecting the ones that were already vulnerable. In two fronts, vulnerable population that might demand even more “targeted” designed facilities to have safe access to mobility but also from the supply chain side. The issues of limited mobility will disproportionately affect small businesses and producers in their way they bring products and services to markets
- Structural changes may happen in supply chains as we know them now with a natural and immediate push to local produce, local economies and shared economies. This in turn will likely imply more local congestion and use of small and less developed networks to connect fringes of markets to consumers.

This rapidly evolving crisis has also created a natural experiment and learning opportunity where reduced travel demand and transport services are resulting in commensurate reductions in transport-related emissions of GHG and local air pollutants.

## What is the overall emergency response in the sector?

Key short-term policy interventions can be grouped/defined in 3 pockets equally relevant for the most critical transport sectors: public transport and supply chains (domestic, maritime and of air transport):

1. Adopt protocols and allocate resources to permit sanitary use of transport services under pandemic conditions.
2. Prepare contingency plans for the provision of lifeline basic mobility (or maritime/logistics/air) services for critical workers and emergency circumstances.
3. Introduce arrangements to support financial sustainability of transport operators, as well as mothballing arrangements for fleets and provision of short-term emergency support for redundant (or temporarily laid-off) workers.

## What are some of the best options in the short to medium term?

After immediate-responses to limit the spread of the virus have taken place, it is imperative to focus attention on:

- (a) Maintaining (and restoring) the functionality of transport services and supply chains; and
- (b) addressing financial distress of the operators as it could severely impair the provision of necessary transport services.

In the medium term it will also be important to

- (c) reactivate investment projects that might be stalled or temporary suspended; and
- (d) re-prioritize those pipeline projects with largest impact on job creation and restitution of supply chains functionality.

## What is the WBG's current response?

There are several ways in which ongoing transport operations can be used to support COVID-19<sup>1</sup> which will be combination, in the short and long-term, of DPL prior actions and IPF interventions let those be emergency projects, additional financing or repurposing of undisbursed loan shares. Substantively some indicative interventions include:

- Activating Contingent Emergency Response Components in existing operations: World Bank teams are supporting clients also exploring options to activate CERCs (Contingent Emergency Response Component) in response to the rapidly-evolving crisis. For example, Bank projects may reallocate funds for emergency maintenance works to keep roads open for traffic using mechanized maintenance on the carriageway and subcontract roadside maintenance under length-person contracts (i.e. one person or a family only to work on one km stretch). Bank projects may also give priority to rural road maintenance works and mobilize funds for providing emergency transport services to assure access to health systems and delivery of medical supplies.

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<sup>1</sup> It is expected that expanding travel restrictions and border closures will impact construction and supply contracts supported by Bank operations. International contractors and consultants may not be able to mobilize workers, equipment or materials in a timely manner. This will impact construction progress and disbursements, especially for projects closing in the next few months. There are Force Majeure and suspension provisions in contracts, but further guidance on these issues as well as ongoing procurement processes may be needed.

- Re-prioritizing investments where possible: Rural roads projects can revise existing priority lists for rural road construction projects to ensure linkage of population to critical markets, hospitals and other facilities.
- Developing pandemic response protocols for transport agencies: Where possible, the capacity development components of projects could be used to support the development of pandemic response protocols/roadmaps for transport agencies and operators.
- Reviewing and upgrading capacities of transport operators: Where possible, include a review of the capabilities to handle port operations and supply chain support to the gateway region in a pandemic situation; as well as digitalize and automate as many processes and operations to enable clients to operate Ports and the critical logistics services remotely. If possible, support emergency passenger and freight transport provisions for essential needs (medical staff and patients, food, medical supplies).
- Developing and enforcing additional health and safety protocols for construction work: Add provisional materials and equipment and personal protection supplies for workforce environment improvement, sanitation and disinfection, and safety inspection processes.
- Closing financing gaps: Supporting the financing gap caused by the increasing costs and dropping revenue.
- Knowledge exchange: Sub-sectoral knowledge exchange events (VCs, webinars) to share experiences among countries on topics what clients want to learn most.

This crisis is also an opportunity to learn in the transport sector (and all other sectors) on the importance of mechanisms for collective action and to suggest criteria for support to transport companies under financial duress as a result of COVID-19.

## IMPACTS

### *1. What are the major sectoral impacts of the COVID-19 crisis?*

The negative demand-shock on transport demand is visible and, in some cases, devastating. The International Road Union estimates the decline in global road transport activity of up to 20 percent in 2020, depending on how long the situation continues, and the impacts on aviation, public transport and maritime are even higher.

In the short-run, the most conspicuous impacts are being seen in aviation, public transport and logistics. This crisis is being felt firstly in public transport and commercial aviation; and then as city, regional and country borders close, the impact on goods, services and production nodes are also starting to become apparent (with shortages of products, made worse by stock-piling). Furthermore, in the short- and mid-run, the provision of these services will likely be severely impaired due to financial distress of the operators.

The critical impacts on the transport sector are as follows:

- **Public Transport:** In metropolitan areas, the responses to COVID-19, from implementing social distancing to lockdown policies, are having a very large impact on passenger transport services and particularly mass transit systems that are designed to move a large number of people in dense urban areas. Transit ridership is plummeting, putting transit authorities in financial distress. In developing countries, public transport is largely informal and privately owned. Bus owners and drivers earn income only if they carry passengers. These groups are, therefore, very vulnerable.
- **Shared Mobility:** Shared mobility has also been heavily impacted. This is bringing to light the risks associated with the 'gig economy', where the workers do not have any benefits to fall back upon and often do not have the resources needed to weather such shocks on their livelihood. Ridership for major shared mobility platforms has halved and many are cancelling/reducing service.

While it is unclear whether these immediate changes in travel behaviors will translate into medium- and long-term changes in travel patterns and behaviors, it has exposed the susceptibility of the transit and shared mobility sectors to financial distress. The public transport system especially, as it tends to serve the poor and disadvantaged populations, will be under additional financial stress from reduced fare revenues. Several transit agencies are cutting down service frequency to reduce the spread of the virus and in response to the dwindling demand. In addition, many are also introducing measures to respond to threat of virus spread.

- **Logistics:** The global logistics market (transport, inventory management, warehousing, order processing, and other supply chain activities) accounts for roughly 12 percent of global GDP, with a turnover of about USD 8-12Tn. The spread of the virus is revealing the vulnerability of the global supply chain for goods. There is significant disruption in the supply chain and demand is fast outpacing supply capacity. For example, there have been spikes in demand for food and some essential non-food items (especially medical supplies). Food supply chains could collapse due to the lack of transport to take products from farm to table. Food will continue to be produced in the short term, but might not be delivered on time, particularly to urban dwellers. At the same time, the demand for some health supplies is already overpassing the available supply. The supply

producers will be (in many instances) in geographic locations far apart from where the goods are needed. The situation is further exacerbated by large orders from developed countries which absorb supply capacity, and unilateral action and export controls by several countries. However, the phasing of this pandemic, in which developed countries (in general with better and more resilient supply chains) were affected first, might work in favor of getting supplies to less mature supply systems, provided the supply chains recover on time to be effective.

- **Aviation:** Aviation has been the hardest hit segment of the transport industry with plenty of evidence of collapsing demand. The International Air Transport Association (IATA) estimates that airlines could lose [passenger revenues of \\$113 billion](#) globally, if the virus spreads further. Despite the challenges that the aviation sector is facing, it remains a critical part of the solution for the keeping the supply chain of critical supplies unbroken.

The aviation sector outlook is bleak overall; tourism and travel face an 'existential threat' from COVID-19. However, the challenges for emerging markets will be higher, especially in Africa where the sector has not been profitable for more than two decades. Globally, many carriers may face bankruptcy (some of which are state-owned airlines). Such bailouts will require substantial public funds. By the end of May, many world airlines may be technically bankrupt, if no action is taken. This will result (and is already resulting) in layoffs of airlines workers, airport workers, and other related sectors, which needs to be managed to the extent possible to limit these negative impacts. The impact of the virus on air transport services is staggering and many airlines and countries have cut operations.

## *2. Which countries are most affected by these impacts?*

The following four types of countries would be most impacted by COVID-19:

- **Countries with Value Chains highly linked to Epicentres of COVID-19:** COVID-19 has wiped off \$50 billion off global exports in February alone. Countries that directly link with epicentres of the outbreak will face severe supply chain disruptions.<sup>2</sup>
- **Countries with major ports that act as hubs for regional supply chains:** Countries that act as major hubs for flow of goods and people may be most susceptible to the disruptions caused by COVID 19.
- **Countries with long or weak supply chains for essential goods:** Smaller and low-income countries who cannot produce enough essential goods (such as food, feed, sanitation and medical supplies, medication) domestically (or locally) will have urgent life- and health-threatening shortage due to trade and transport disruptions.

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<sup>2</sup> The largest effects of China's economic slowdown will be felt by the European Union, the United States and Japan. Overall UNCTAD predicts that the following 20 economies will be witness the greatest impact: Australia, Bangladesh, Belarus, Cambodia, Canada, Costa Rica, EU, Hong Kong, India, Indonesia, Israel, Japan, Republic of Korea, Malaysia, Mexico, Morocco, New Zealand, Norway, Pakistan, Philippines, Russian Federation, Saudi Arabia, Singapore, South Africa, Switzerland, Taiwan, Thailand, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, and Vietnam.

- **Countries with large urban population, dense urban areas or heavy reliance on public transport:** The transport challenges of moving passengers safely and transporting essential goods with drastic demand change are much more difficult to tackle in large dense urban areas than relatively sparse and decentralized small towns and rural areas. Low-income countries tend to be less motorized with more people who rely on public transport therefore will no doubt be hit harder than the developed countries where the majority have private vehicles.
- **Countries with strong exposure to transport PPPs:** As transport demand falls, countries with substantial PPPs will face additional risks. Force majeure, compensation and change in law clauses might apply depending upon the circumstances of each case.

## Policy Responses

### *1. What have countries already affected successfully done to address the issues?*

Many countries have issued guidelines for prevention and response protocols across various modes of transport. While all countries are acting to firstly prevent the spread of COVID-19 and then to respond to the challenges imposed by the spread, the response from China and European Union is the most developed given the high spread of the virus that they are experiencing. The policy response of governments to date (as it relates to COVID-19) can be categorized into measures that prevent the spread of the virus, monitoring and immediate response, managing the flow of goods and food supplies, and ensuring the health and safety of transport workers as described below.

**Prevention.** Some countries are:

- *Facilitating or mandating social distancing:* (a) limiting the flow of people in and out of areas. Limiting entry into countries, through travel bans. Limiting large gatherings of people; (b) providing public buses free of charge (or at reduced charge) or subsidizing private operators to help reduce crowding in public transport.; (c) banning cash handling in public transport vehicles; and (d) mandating that public transport operate below capacity to increase distance between passengers.
- *Cleanliness:* Mandating transport service providers to clean and disinfect vehicles, waiting rooms and working places (for example, public transport operators have been asked in many countries to sanitize buses/rollingstock and provide hand sanitizers to onboard passengers).
- *Information Dissemination:* Mandating the public transport systems display preventative measures and educate the public.

**Monitoring and Immediate Response.** Some countries are:

- Setting up and managing gateway/access control and infection inspection (testing, thermal gates, and so on) at control points (like airports, bus stops, metro platforms, and so on).
- Performing risk assessments of different transport operations, modes, lines, and services and make adjustment plans accordingly.

- Performing risk assessments of different groups of people, assigning different travel privileges.
- Using of drone technology (and other remote methods) that may help identification of infections and monitoring social.

**Managing flow of food and goods.** Some countries are:

- Providing financial incentives for, and subsidies to, transport, storage, and cold chain fees, for essential goods.
- Establishing new/special supply chains to connect producers to end users: e.g. governments work closely with businesses, help supermarkets, local communities, and large enterprises to connect to producers directly.
- Providing non-contact food delivery mechanisms for high risk or infected population.
- Prioritizing essential transport needs for supply chains and periodically updating the prioritization based on current risk assessment, for example at the peak of the outbreak, transport of medical supplies and food get prioritized and have the 'green light' (less stopping, checking, tolls) when crossing administrative borders.
- Planning for emergency transport for essential needs, fuel, food, and medical supplies and equipment and planning for rationing of essential foodstuffs and fuel.
- Organizing and managing long-distance and large-volume travel (e.g. transporting medical supplies, doctors and nurses, and construction works for emergency hospitals or quarantine facilities to strategic locations, getting essential workers back to workplaces, etc.

**Ensuring wellbeing of transport workers and sustaining the transport sector:** Some countries are:

- Launching training, consultation, and emotional program for transport workforce. Subsidizing medical supplies needed for transport workforce. And providing safety/physical security to transport workers.
- Preparing immediate rescue packages to maintain liquidity and business continuity for essential airlines and other transport operators (in some cases by diverting resources from other sectors (like education)).
- Initiating a new era of multilateral economic regulation of the transport sector through a "nationalistic" lens.

## *2. What do we recommend as priority fast impact policy measures?*

After immediate-responses to limit the spread of the virus have taken place, it is imperative to focus attention on four dimensions:

- a) Maintaining (and restoring) the functionality of transport services and supply chains; and
- b) Addressing financial distress of the operators as it could severely impair the provision of necessary transport services.



In the medium term it will also be important to:

- c) Reactivate investment projects that might be stalled or temporary suspended and;
- d) Re-prioritize those pipeline projects with largest impact on job creation and restitution of supply chains functionality.

**a. Maintaining (and restoring) the functionality of transport services and supply chains:**

It is critical to prioritize transport functions and make plans to sustain essential services and operations, ensuring these services are not disrupted even with quarantine policy or travel restrictions, and that essential goods are available. This means, among other things, that transport businesses must meet health and safety standards imposed by local and central government agencies.<sup>3</sup>

Specific measures vis-à-vis passenger transport include (but are not limited to):

- Developing protocols/procedures and providing resources to identify possible infection cases during the transport process to reduce risks of spreading the infection.
- Developing and implementing preventative measures to limit the spread of disease to passengers and staff. This could include:
  - increased cleaning and disinfection procedures of transport assets (frequency, types of disinfectants used),
  - allowing for safe distances between people,
  - introducing hand disinfection procedures and equipment at key stations and onboard vehicles,
  - Ensuring transport services for essential workers and functions, such as medical facilities, and
  - Screening passengers at major transport facilities (e.g. airport terminals, key train and bus stations) and isolating those at risk.
- Establishing open and effective communication channels with centralized, reliable, consistent information to the public on symptoms of infection, current situation, preventative measures, how to contact relevant authorities, DOs and DON'Ts, a crisis and emergency communications strategy, and campaigns in transport facilities and vehicles to alert users of the risks and recommended measures to combat COVID-19.
- Developing and implementing pandemic response plans for transport operations. Strengthening emergency preparedness, management and response capacity for transport agencies. Monitoring and implementing changes to transport services to respond to changing demand, availability of staff, and increasing the resilience of the systems.
- Using drones and other technologies for remote monitoring of transport systems. In some cases, relaxing drone usage regulations to allow for remote monitoring and in other cases establish protocols for safe movement of drones.

Specific measures vis-à-vis business continuity of essential supply chains include (but are not limited to):

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<sup>3</sup> If there are any violations of government requirements, which includes a case of a worker getting infected, that could lead to receiving a shutdown order.

- Mapping out critical supply chains across various transport modes (aviation, maritime, rail, road). This mapping should be used to develop contingency plans for sourcing essential goods under different COVID-19 spread intensity and geographic distribution.
- Identifying critical multimodal transport routes for efficient provision of goods to the population and working with the private sector to ensure steady flow of needed goods along these routes (providing financial support if needed).
- Developing rationing and distribution mechanisms for essential goods (food, fuel, medicines).
- Facilitating cross-border, and within country, transport of goods by waiving select procedural requirements while maintaining safety and quality standards. Ensuring efficient logistics for critical goods (food and medical supplies). For example, (a) streamlining border crossing process; (b) removing or reducing tolls, road user charges for trucks and coaches; and (c) waiving storage charges caused by delays, if the authorities are also port/ yard operators collecting such costs.
- Maritime: Investigate the potential chartering of maritime vessels, including using the military, where necessary, to ensure the functioning of key maritime gateways

#### **b. Addressing financial distress of the operators:**

Due to the public service character of infrastructure services, financial distress of providers will lead to substantial fiscal pressures for the state. These likely increased fiscal pressures from both SOEs and PPPs are coming at a time when government finances were already stretched prior to the crisis and are likely to be further stretched by the cost of crisis response measures as well as likely falls in tax revenues. Moreover, transport services will become more expensive (and costly) as additional actions will be demanded from providers to adjust services to “social distancing” protocols and likely—even if temporarily—in terms of density and intensity of use of assets as adding layers of sanitation and cleanness not needed hitherto. All this adds to the inevitable financing stress of providers.

Specific measures to alleviate the financial distress faced by operators include (but are not limited to):

- Developing a plan for financial support and restructuring, including debt refinancing for public sector transport companies to allow them to function in an efficient manner during and post crisis. For example, evaluating the impact of lower revenues on public transport system and raising alerts to municipal/national budgeting authorities to address potential funding shortages or the need for temporary increases in subsidies. In the case of airlines, bankruptcies and bailouts of SOE carriers are a realistic prospect.
- Developing institutional, policy and financial packages to help and acknowledge informal service providers. This is an opportunity for all these providers to become visible and receive financial assistance that would lead to their formalization and integration to a public transport system or a logistic system.
- Developing financial support and restructuring packages for large private sector operators of transport services.

### 3. World Bank Group Support

#### a. How can we adapt ongoing WBG operations to support the COVID-19 response?

There are several ways in which ongoing transport operations can be used to support COVID-19<sup>4</sup> response in the short-run. For example:

- Activating Contingent Emergency Response Components in existing operations: World Bank teams are supporting clients also exploring options to activate CERCs (Contingent Emergency Response Component) in response to the rapidly-evolving crisis. For example, Bank projects may reallocate funds for emergency maintenance works to keep roads open for traffic using mechanized maintenance on the carriageway and subcontract roadside maintenance under length-person contracts (i.e. one person or a family only to work on one km stretch). Bank projects may also give priority to rural road maintenance works and mobilize funds for providing emergency transport services to assure access to health systems and delivery of medical supplies.
- Re-prioritizing investments where possible: Rural roads projects can revise existing priority lists for rural road construction projects to ensure linkage of population to critical markets, hospitals and other facilities.
- Developing pandemic response protocols for transport agencies: Where possible, the capacity development components of projects could be used to support the development of pandemic response protocols/roadmaps for transport agencies and operators.
- Reviewing and upgrading capacities of transport operators: Where possible, include a review of the capabilities to handle port operations and supply chain support to the gateway region in a pandemic situation; as well as digitalize and automate as many processes and operations to enable clients to operate Ports and the critical logistics services remotely. Is possible, support emergency passenger and freight transport provisions for essential needs (medical staff and patients, food, medical supplies).
- Developing and enforcing additional health and safety protocols for construction work: Add provisional materials and equipment and personal protection supplies for workforce environment improvement, sanitation and disinfection, and safety inspection processes.
- Closing financing gaps: Supporting the financing gap caused by the increasing costs and dropping revenue.
- Knowledge exchange: Sub-sectoral knowledge exchange events (VCs, webinars) to share country experiences on topics what clients want to learn most.

#### b. What new operational interventions would be the most effective?

Select operational interventions that could be most suitable in the short and medium/long term are presented below. These are categorized into policy-based operations and investment-based operations.

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<sup>4</sup> It is expected that expanding travel restrictions and border closures will impact construction and supply contracts supported by Bank operations. International contractors and consultants may not be able to mobilize workers, equipment or materials in a timely manner. This will impact construction progress and disbursements, especially for projects closing in the next few months. There are Force Majeure and suspension provisions in contracts, but further guidance on these issues as well as ongoing procurement processes may be needed.

### Short-Term:

**Policy Reform:** In the short run, several sectoral reforms can be undertaken to strengthen capacity of regulating authorities and service providers to facilitate the financial easing of public transport cooperation:

- Overall:
  - Developing and formalizing national pandemic response protocols for transport agencies and operators.
  - Developing mechanisms and establishing criteria for support to transport companies under financial duress as a result of COVID-19.
  - Developing and adopting sanitary and phytosanitary standards for measures apply to domestically produced food or local animal and plant diseases, as well as to products coming from other countries (where applicable).
- Public Transport: In centralized countries, decentralizing public transport legal authority to oversee, regulate, and reform and manage public transport to municipal authorities, because they are closer to the issues.
- Aviation: Taking policy actions to reduce fleet fees, charges and taxes to the sector to elevate short term financial crunch.
- Maritime: Investigating the potential chartering of maritime vessels, consider using the military, where necessary, to ensure the functioning of key maritime gateways.

**Investment Opportunities:** In the short run, several actions can be undertaken to rejuvenate the economy and ensure critical enhancements to combat COVID-19:

- Roads:
  - Increasing financing for road maintenance to generate livelihood for the bottom 40 percent and reenergize the economy
  - Developing community groups for provision of transport services in remote locations.
- Public Transport: Establishing fare collection system that is cashless and technology agnostic.

### Medium to Long Run:

**Policy Reform:** In the medium term, the following policy reforms can be undertaken in the transport sector.

- Transport Services Reforms: Undertaking the necessary reform at the national level to formalize the trucking and public transport sectors.
- Railways: Reduce the reliance of railway companies on subsidies by mandating KPI-based Public Sector Obligations contracts and Multi-Year Maintenance contracts between railway companies and the government that generate proper incentives to improve performance and lower costs.
- Public Transport: Reform contractual arrangements between public transport authority and operators and establish codes of conduct for interacting with passengers.
- Aviation: Liquidate or restructure State Owned Carriers that are in high debt and not financially sustainable in the long run.

**Investment Opportunities** : In the medium term, the following investments can be undertaken:

- Overall: Increasing focus on operations geared towards reducing frictions are multimodal hubs to improve flow of passengers and goods.
- Rural Roads: Gearing all future rural roads projects towards improving connectivity to local markets, trading centers, and health facilities. Where possible, include the development of logistics infrastructure (collection points, sorting, grading, storage/cold storage) to reduce post-harvest losses.

## References and Other Sources

<http://www.trb.org/main/blurbs/180248.aspx>

<https://www.spglobal.com/ratings/en/research/articles/200204-coronavirus-impact-key-takeaways-from-our-articles-11337257>

<https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2297>

<https://www.flexport.com/blog/coronavirus-update-how-to-jump-start-your-supply-chain/>

<https://unctad.org/en/PublicationsLibrary/ditcinf2020d1.pdf>

<https://time.com/5802661/coronavirus-cancellations-workers/>

<https://unctad.org/en/PublicationsLibrary/ditcinf2020d1.pdf>

<https://www.nytimes.com/2020/02/27/business/economy/china-coronavirus-shipping-ports.html>

<https://voxeu.org/content/mitigating-covid-economic-crisis-act-fast-and-do-whatever-it-takes>

<https://www.cnbc.com/2020/03/16/coronavirus-wreaks-havoc-on-retail-supply-chains-globally.html>

<https://www.ft.com/content/1071ae50-6394-11ea-b3f3-fe4680ea68b5>

<https://www.cnbc.com/2020/03/16/coronavirus-wreaks-havoc-on-retail-supply-chains-globally.html>

<https://ctl.mit.edu/news/mit-ctl-responds-uncertainty-supply-chains-caused-coronavirus>

<https://www.thelancet.com/action/showPdf?pii=S0140-6736%2820%2930411-6>