

FUTURE CITIES SERIES: TECH-DRIVEN SUPPLY CHAINS TO HELP SHAPE FUTURE CITIES

15 July 2020 | Global

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The criticality of global supply chains to not only economic strength but also societal health has been brought into sharp focus by the Covid-19 pandemic. As economies look towards pathways to recovery and resilience, supply considerations will be paramount. Additionally, policy responses to the crisis such as border closures, population lockdowns and trade restrictions have inherently impacted on the operation of internationally integrated supply chains and demonstrated the need for greater resilience, flexibility and diversification.

This article is part of our Future Cities series where our sector experts examine the most pressing issues facing our cities in the post-Covid era and provide their views and advice on how to prepare for, and adapt to, the long-term legacy of the crisis.

COVID-19 & THE NEW ERA OF SUPPLY CHAIN DISRUPTION

Covid-19 is a further manifestation of a 'new normal' of disruption that has challenged the relative stability of the global economy and businesses over the last three decades. Macro-level trends such as climate change, trade wars, and the rise of 'great states' geopolitics coupled with the immediate and dramatic challenges of the pandemic have emerged as key drivers which will shape the supply chains of the future.

SUPPLY CHAIN REORGANISATION & THE SHAPING OF FUTURE CITIES

The principles of lower unit cost, efficiency and timeliness that have defined modern supply chains are being challenged by this less stable, less predictable new normal. As modern, transnational supply chains (which rely heavily on free trade, conflict-free relations between nation states and open borders) adapt and transform to ensure that they have the necessary resilience to support the economies that rely on them, future cities themselves must also respond to meet the needs of a reshaped supply chain orthodoxy. As Lincoln might have put it, *"the dogmas of the quiet past are inadequate for the stormy present"*.

While the true form of a world post-pandemic is yet to fully emerge, it is possible to anticipate some supply chain changes that will affect the shape of future cities including:

- **Increased need for high capacity, resilient digital infrastructure:** Data and connectivity are likely to be the lifeblood of reshaped supply chains so it will be essential that future cities (whether brownfield or greenfield) have the necessary data and communications infrastructure to enable supply chain continuity and resilience.
- **Re-emergence of onshore manufacturing:** As on-shore manufacturing begins to breathe new life again, we are likely to see a trend for manufacturing and industrial hubs to support new industries and the needs of cities including energy supply, distribution, transport and digital infrastructure.
- **Disaggregation of workforce populations and supply chains:** Traditionally supply chains have been clustered primarily or solely in major cities, however we are likely to see a shift to more diversified supply chains that have geographical spread. This will be partly as a result of the viability of major distribution hubs in high-density cities coming under increasing pressure, but also reflecting the societal shift away from dense populated living and rise in WFH culture.
- **Greater focus on localised transport and logistics infrastructure:** With a shift to decentralised, smaller scale manufacturing and localised supply chains, the transport and logistics requirements will be materially different in cities of the future. They may result in less reliance on mass transit systems and a greater focus on major road infrastructure to enable more efficient intra-city operations.
- **Integration of existing supply chains:** Future cities will likely have a key role as 'hubs' for the integration of existing supply chains (providing a centralised import/export function for goods and operating as the point where geographically diverse elements of the supply chain are integrated prior to distribution) and will need to be designed accordingly to provide the necessary infrastructure - in particular digital infrastructure facilitating the increased digitalisation in manufacturing and logistics (for example, ultrafast broadband, 5G networks to support IOT solutions, edge computing and data

centre capacity) - to enable efficient and resilient supply chain operation.

SUPPLY CHAIN FLEXIBILITY, DIVERSIFICATION AND RESILIENCE DRIVEN BY TECHNOLOGY

While manufacturing has long been heavily reliant on technology, deployment of technology to enable supply chains to operate on an end-to-end basis (spanning R&D, design, manufacturing, distribution and end user delivery) is a comparatively new development. During Covid-19, we have witnessed an expedited adoption of technologies such as automation, data analytics and artificial intelligence across supply chains. For example, the pharmaceuticals and biotechnology industries are deploying AI to discover and develop treatments for the Covid-19 infection and the United States are exploring robotics solutions to protect its food supply.

This accelerated adoption of technology can support mitigation of supply chain risks presented by systemic disruptive events such as Covid-19 as:

- resilience is enhanced due to the event and geography agnosticism inherent in technology and in the decreased reliance on human workforces
- flexibility is supported by 'intelligent' supply chains that are designed to respond to the effects of disruptive events (and future demand curves)
- adaptability is increased as activities such as retooling to meet changed needs become (at least in part) a matter of switching technology rather than people
- diversification of supply geographic origin becomes simpler to achieve, as supply chains can to some extent be replicated by re-deploying known technologies rather than being built from the ground up.

AN HOLISTIC SOLVE: SUPPLY CHAINS ENABLED BY TECHNOLOGY & FUTURE CITIES

The impact of disruptive events like Covid-19 on supply chains is transformative, and both technology and the cities of the future will have core roles in shaping this long lasting transformation. While deployment of technology can reduce some of the practical supply chain risks that have been highlighted by Covid-19, it forms only part of the solution to achieving resilient supply chains of the future. A more fundamental reshaping of the infrastructure that underpins modern supply chains will be necessary to achieve the flexibility, diversification and resilience demanded by business, consumers and governments.

Businesses operating in industries that support the development of cities should also carefully consider their allocation of capital with reference to the potential shape of future supply chains, and assess whether strategic investment in key areas may better place them to be a part of the growth of the cities of the future.

Measures that may feature in implementation of this integrated solution for future supply chains include:

- Governments taking a greater role in establishing onshore industrial and manufacturing capability. Economic self-reliance (India) and strategic autonomy (European Union) are phrases which governments have been recently voicing, and in developed economies such as Australia this 'onshoring' of supply chains will more likely look to value-added or knowledge-based industries to create less globally-dependant supply chains.
- Government policy settings may be re-calibrated to facilitate new industry and infrastructure and reshape existing models, for example:
 - government may take equity interests in businesses in core supply-chain industries
 - 'red tape' regulation that impedes change to existing supply chain infrastructure and establishment of new businesses in industries critical to supply chains may be amended or removed
 - tax incentives may be implemented to incentivise investment in supply chain businesses.
- Regulators applying increased scrutiny and oversight in response to risks created by systemic supply chain disruption trends, for example:

- Regulators may mandate businesses' approach to integrated planning to avoid or mitigate against supply chain vulnerabilities particularly in sectors that are essential and strategically important, such as infrastructure (including digital infrastructure), energy and healthcare.



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