Unified Rules

Mid-future optimistic scenario
Vehicles with level 2 autonomous driving functionality will become mainstream in the next ten years. Multiple manufacturers will provide the option to have autonomous driving installed in new cars as a safety and convenience feature.

Customers receive full control of their data and privacy safeguards installed by manufacturers. Customers can easily delete data from cars when they're resold in the pre-owned markets. Rules and regulations are unified across the globe, so learnings from driving on one side of the world immediately improve driving on the other side.

Continental Licenses

Mid-future neutral scenario
Vehicles will have regional requirements but will be interoperable at the continental level. Meaning that cars in Europe can function throughout most of the European Union and vehicles in America can operate across most states. Standards will be set and will not require significant alterations to be manufactured for all regions.

Standardized production will look very similar to today’s car manufacturing and internet privacy rules, where products can be made globally and customized locally. Privacy implementation strives to be done at the most rigorous standard for the region in question.

Uncrossable Border

Mid-future catastrophic scenario
Fragmentation of regulation and data privacy cause a complete lack of interoperability. You can’t take a car designed for one state to the next due to regulations that limit design, features, and functionality. Car manufacturers must design platforms and brands for specific jurisdictions.

The need for specific jurisdictions removes the ability to have world platforms in manufacturing, driving up production costs, dramatically decreasing the speed of improvements, and extending development cycles exponentially.

You must stop at every border and create a new account for your car with additional information and accept the terms and conditions of operating the vehicle in the next jurisdiction. Certain features and functions are enabled or disabled based on where you are traveling and what terms and conditions you accept. Insurance may only cover you in some areas and circumstances.
Decarbonizing Flight

KEY INSIGHT
Hydrogen fuel cells could power commercial aviation.

EXAMPLES
Last year, ZeroAvia successfully completed an 8 minute flight that resulted in no carbon emissions. Using a retrofitted Piper M-Class plane, the test proved that hydrogen—which carries little or no carbon footprint—could someday become an alternative to fossil fuels. Airbus has three hydrogen power programs in the works and could start testing commercial flights as early as 2025.

DISRUPTIVE IMPACT
Aviation contributes 3% of the world’s total carbon emissions. When flights stopped during the COVID-19 pandemic, there were noticeable changes to air pollution. As air travel returns to pre-pandemic levels over the next few years, there will be increased calls to reduce emissions. Hydrogen-powered planes, while still under development, could be a viable alternative.

EMERGING PLAYERS
- ZeroAvia
- Airbus
KEY INSIGHT
Several companies are developing technology to bring back commercial supersonic jet travel.

EXAMPLES
After years of successful transatlantic flights, the age of supersonic jet travel came to an end in October 2003, when British Airways permanently grounded the Concorde. Driven in part by the enthusiasm and excitement over faster autonomous travel, supersonic jets are being tested once again. Japan Airlines invested $10 million in Colorado-based Boom Supersonic to develop supersonic jets, which will travel at 2.2 times the speed of sound—or about twice as fast as a standard aircraft. Japan Airlines has already preordered 20 such jets, and Boom unveiled its prototype in October 2020 for test flights in 2021. Aerion Supersonic in Nevada is also developing a carbon-neutral supersonic jet that is expected to take off in 2023.

DISRUPTIVE IMPACT
Faster travel between locations could stimulate economic development and bring cultures closer together. Reduced sonic boom will enable flights to take off over land, overcoming a significant limiting factor in the routes that the original Concorde could fly. But fuel efficiency and safety concerns may slow progress in getting supersonic air travel to market in the short term.

EMERGING PLAYERS
• Aerion Supersonic
• Boom Supersonic
The End of Traffic
Mid-future optimistic scenario
In the next 10 years, companies master vertical takeoff and landing craft that operate similarly to helicopters but they are affordable, easy to pilot and easy to maintain and as cost-efficient as car transportation. Commuters increasingly adopt short-distance aerial travel as their regular form of transportation. This redistributes traffic on roadways, which are now dominated only by heavy and long-distance transport, while light transit takes to the air.

Pilot Shortages
Mid-future neutral scenario
New aircraft are developed but continue to require highly trained and skilled operators like helicopter pilots. Technological advances for more economical operation, opening up specific commutes and routes, mostly along existing helicopter routes that will handle increased capacity due to lower cost. Island hopping and taking the chopper to the airport will be available to the affluent instead of just the hyper-wealthy. The adoption of regulations and infrastructure modeled after helicopter transport incorporate more significant pilot assistance systems reflecting autonomous vehicle regulations.

Forgotten Infrastructure
Mid-future pessimistic scenario
Flying taxis become the method of travel of choice for the hyper affluent, who only travel in the air. Air transit becomes a lightning rod for the global wealth divide, as less is invested in land-based transit infrastructure and public transportation.
KEY INSIGHT
Efforts are underway to create autonomous, AI-powered ships, and the legal framework is emerging for them to operate safely and officially in international waters.

EXAMPLES
IBM and ProMare, a marine research organization, launched a fully autonomous ship called Mayflower, from Plymouth, England, last year. It features an AI captain that gives the vessel the ability to assess its environment and make decisions at sea with no human captain or onboard crew. Volvo’s maritime subsidiary Penta launched an autonomous boat docking system—boat captains push a button and it docks without human assistance. Norwegian chemical company Yara International built The Yara Birkeland, an electric container ship supported by radar, lidar, machine learning, computer vision, an automatic mooring system, and a network for cameras. The company planned to transition the vessel from human-crewed operation to remote-crewed operation in 2019, and then to autonomous operation in 2020. The pandemic slowed the timeline, and humans are staying on board for now—which helps with regulatory and insurance complications, too.

DISRUPTIVE IMPACT
Large autonomous ships could transform shipping by increasing efficiency, reducing costs, and reducing human error. Electric ships that don’t require human crews could offer cost savings throughout the shipping supply chain. They could solve labor shortages, increase safety, and reduce environmental harm. The International Maritime Organization is performing a scoping exercise before drafting the legal frameworks for maritime autonomous surface ship travel. In the near to midterm, the goal is to design AI systems that will support human-crewed ships.

EMERGING PLAYERS
- ProMare
- Penta
- IBM
- Marine AI
- Yara International
- Wärtsilä

Volvo Penta launched an autonomous boat docking system.
The governments and companies that lead international infrastructure projects have powerful influence on setting regional, global, and geopolitical standards. China’s multibillion-dollar Belt and Road Initiative is the source of massive investment in infrastructure development, including roads, rail, sea, and air travel. The vast extent of the investment and partnerships with Asian, East African, European, and developing countries has helped make China the preferred financier and producer of transport and power infrastructure on the global geopolitical scene.

**Examples**

China’s Belt and Road Initiative began in 2013 and has primarily focused on investment in infrastructure, education, construction, rail, highway, auto, and the electrical grid. The effort is enormous—roughly 12 times larger than the U.S.’s Marshall Plan, which helped Europe rebuild after World War II. In 2017, the Belt and Road Initiative involved an estimated 68 countries, 65% of the world’s population, and 40% of global gross domestic product.

**Disruptive Impact**

Critics worry that the debt created by the project will cause an imbalance of leverage in geopolitical relations. Many of the countries involved are developing nations that urgently need the infrastructure, but may have limited ability to handle the debt sustainably. While China is offering a moratorium on debt servicing during 2020, the debts will eventually come due and require potentially long-term global partnerships to address.

**Emerging Players**

- Asian Infrastructure Investment Bank
- New Development Bank
- National Development and Reform Commission

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3rd Year on the List

China’s Foreign Infrastructure Investment

49, Robots and Transportation

Watch Closely

Informs Strategy

Act Now
INNOVATION

Network upgrades, decreased latency, automated transportation, and new delivery options unlock a wide swath of new products, businesses, and opportunities to grow. The next several years will be dynamic, with continual improvements across many sectors. Innovation teams must be prepared to monitor development and anticipate change.

R & D

R&D leaders are playing a larger role in identifying businesses of the future, with some asked to present their ideas to their executive leadership and boards. Going forward, R&D leaders will need to consider a broader range of trends. For example, in what ways will 5G lead to new business growth in agriculture and finance? An organization’s ability to think beyond existing business units will deliver stronger outcomes as the trends described in this volume mature.

RISK

Trends in networks, transportation, logistics, robotics, and transportation are complex and involve a tech stack that many organizations don’t yet have. Chief risk officers should consider developing a strategy to optimize risk to deliver stronger business models—rather than using governance to slow the adoption of emerging technologies and standards.

Application

Information technology, supply chains, transportation, and network connectivity are becoming more complex, which will require strategists to be more agile in near-term planning. Savvy corporate strategists will consider how this complexity could lead to a broad range of possibilities. Rather than waiting for further developments, organizations should continually identify signals to inform strategic decisions, monitor outcomes, and determine where they can play—and win.
We recommend using this report to support your strategic foresight activity in the coming year. Every executive team should begin by asking these questions:

1. Are we actively developing and testing new ideas related to the trends explored in this volume? In what ways could our logistics, supply chain, or communications systems be improved?

2. What parts of our business make us vulnerable to disruption in networks, logistics, or transportation? When was the last time we audited the systems that keep those parts of our business safe?

3. Are we adequately planning for the longer term? What assumptions must hold true for our current strategy to succeed? How will we make needed changes?
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