

**EXECUTIVE SUMMARY**  
**APS1012H: High Speed Rail Innovation**  
**Team 5**

High speed rail (HSR) technology is a growing technology being implemented in national infrastructure strategies around the world. This paper uncovers the history, technology, applications, and future of the technology by tying real world contexts and innovation strategies together. The purpose of the paper is to understand the growth of HSR across the globe and take lessons in innovation from the development of the technology in order to improve transportation and solve human problems. Ultimately, increasing the speed, comfort, and efficiency of transportation propels the world into a more globalized human society.

First, this paper introduces the history of high-speed rails, which began in the 1900s. The first HSR was built in Japan, followed by France and Germany. The introduction of HSR technology in Japan is also discussed in order to understand the innovative risks the engineers made when implementing the all-new rail design. This involved changes in the train's signalling design and in the track systems. Biomimicry, the imitation of nature when designing solutions, was a form of innovative design that the original Japanese engineering team used. They modeled aspects of their HSR trains after owls, penguins, and kingfisher birds. As one of the best-known examples of biomimicry, the evolution of the HSR's train design is a pioneer of this form of design innovation.

Next, the paper discusses the global implementation of HSR so far. The European countries have been forming HSR networks, whereas China has been pouring funding into HSR over the past few years. The paper explains why Canada has been lagging behind with this technology. The paper also discusses the economic impacts of such infrastructure in the countries that it has been established in. China's early adoption has led to an increase in socio-economic exchange, coupled with its high ridership. The paper discusses the possibility of Canadian implementation of HSR and what it would impact. Various industries across the country can benefit differently from a national HSR network.

The paper uses a table to compare different transportation methods, factoring in social impact, speed, cost, efficiency, comfort, reliability, energy consumption, capacity, and automation. Automobiles, traditional rail, air, and HSR are compared. Next, barriers and risks are discussed. The Canadian HSR scenario is framed into three narratives that highlight feasibility of an HSR implementation. Next, the paper further discusses possible consumer perspectives on the technology and its impact on whether or not the HSR can be implemented. It's potential in Canada is expanded on further, followed by a discussion of hyperloop, a potential future form of HSR in the world. Hyperloop technology is a new form of innovative technology that has potential to disrupt transportation across the globe.