International Research Journal of Arts, Humanities and Social Sciences (IRJAHSS)

2025

HJRS HEC Journal Recognition System Category Y

Vol 2 Issue 2 (Jan-March 2025)

ISSN (Online): 3006-4740

ISSN (Print): 3006-4732

Rivers, Roads, and Empires: A Historical Perspective on Connectivity and Expansion

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Abstract

This paper examines the evolution of human civilization in relation to rivers and roads, analyzing how waterways influenced early societies and how the development of roads facilitated trade, cultural exchange, and political expansion. It elucidates major riverine civilizations such as the Egyptian, Mesopotamian, Indus Valley, and Yellow River civilizations, demonstrating their dependence on rivers for agriculture, transportation, and urban development. The paper subsequently transitions to the role of roads in historical connectivity, including the Silk Road, Roman roads, the Grand Trunk Road, and contemporary infrastructure schemes like China's Belt and Road Initiative. Through an examination of these transformations, the study underscores how rivers established the foundation for early societies while roads became the primary networks for expansion and global integration. The findings elucidate the transition from localized, river-based economies to global, road-driven trade and political expansion. The study also discusses how modern infrastructure projects perpetuate the historical pattern of connectivity shaping global geopolitics. An understanding of this transition offers significant perceptions into the role of transportation in economic development, cultural diffusion, and geopolitical strategy.

Keywords: *Civilization, Rivers, Roads, Trade Routes, Silk Road, Roman Roads, Grand Trunk Road, Belt and Road Initiative, Infrastructure, Connectivity.*

Introduction

Human civilization has historically been shaped by its environment, with rivers serving as the cradle of early societies. The presence of freshwater sources facilitated agricultural development, urbanization, and economic prosperity. Civilizations such as those in Mesopotamia, Egypt, the Indus Valley, and China flourished along major rivers, relying on them for sustenance, transportation, and trade. However, as societies evolved, the necessity for overland connectivity increased, leading to the construction of extensive road networks. Roads not only enabled economic exchanges but also facilitated political and military expansion. This paper traces the transition from

river-based societies to road-based networks, examining their significance in shaping global history. The central argument of this paper posits that while rivers played a foundational role in the emergence of early civilizations by providing essential resources and transportation routes, roads eventually became the primary arteries of trade, communication, and political control. The study elucidates how rivers fostered the development of ancient civilizations by supporting agriculture, commerce, and early urban centers. The shift from river-centric to road-based societies was driven by technological advancements and the necessity of expanding economic and military influence. Historical road networks like the Silk Road, Roman roads, and the GT Road not only facilitated trade but also promoted cultural diffusion and political dominance. Contemporary infrastructure schemes like China's BRI illustrate the continued significance of road networks in modern geopolitics and global trade.

Literature Review

Scholars have long recognized the critical importance of rivers in the development of ancient societies. Herodotus referred to Egypt as "the gift of the Nile," emphasizing the river's significance in agriculture and trade (Manchip White, 1970). Similarly, research on Mesopotamia, the Indus Valley, and the Yellow River civilization underscores how rivers facilitated irrigation, transportation, and economic prosperity (Postgate, 1994; Dani & Thapar, 1992; Jin, 2005). However, as societies expanded, roads became essential for long-distance connectivity. The Silk Road enabled trade and cultural interaction between Asia and Europe (Hirst, 2020), while Roman roads enabled military control and economic integration (Benedictis et al., 2023). The Grand Trunk Road served a comparable function in South Asia, connecting major economic and political centers (Khan, 2017). In contemporary times, schemes such as China's BRI continue this historical pattern, enhancing global connectivity while simultaneously raising concerns regarding economic dependency and geopolitical influence (He, 2020; Malik et al., 2021).

This study builds upon these works by examining the transition of civilizations from river-based economies to road-driven networks, and its impact on trade, governance, and cultural exchange.

Research Methodology

This research employs a historical-comparative methodology, integrating qualitative analysis of historical texts, archaeological findings, and contemporary case studies. It examines primary and secondary sources on riverine and road-based civilizations, comparing their economic, social, and political impacts. Historical analysis traces the evolution of transportation networks, while comparative analysis evaluates how societies transitioned from river-based to road-centric economies. Case studies of ancient routes like the Silk Road, Roman roads, and the GT Road, alongside modern projects including China's BRI and the CPEC, elucidate the enduring significance of infrastructure.

Rivers and Civilizations

The evolution of civilizations alongside rivers is a fascinating journey throughout human history, highlighting the profound impact of river environments on the development of complex societies. It is usually believed that civilization first came into being in the basins of the major rivers of the globe, and then expand slowly into the foothills that surrounded them.[1] Throughout history, rivers have been the foundation of human civilization from antiquity to the contemporary era. Rivers play a key role in society through drinking water, irrigation, and transportation. They are the origin and foundation of human civilization's growth.[2] Civilization includes a broad range of contemporary and historical societies. It denotes the evolution from primitive stages, such as savagery and brutality, to a more enlightened stage. This progression includes shifts from hunting and gathering to agricultural practices, from illiteracy to literacy, and from small rural infrastructure to complex urban centers. Additionally, civilization includes the advancement of technology and shows dynamic traits that evolve over time. Ultimately, this signifies a defining characteristic of humanity, setting us apart from other species.[3]

There are many diverse perceptions of rivers, they were sources of freshwater to drink and bath, symbolic places associated to religion, waterways appropriate for transportation, contributive features of particularly beautiful landscapes, sources of food, or obstacles on the way. Rivers are dynamic parts of the landscape and naturally change significantly. Perceptions can also vary from person to person and from place to place on the same river.[4] Early human societies developed and flourished in proximity to several primary rivers worldwide. The civilization of ancient Egypt flourished in the vicinity of the Nile River. Sumerian society developed in the southern region of Mesopotamia along the Tigris and Euphrates rivers. Similarly, the Indus or Harappan civilization emerged in the Indus region. Valley refers to a geographical lowland between hills or mountains. Ancient Chinese civilization originated in the Huang He (Yellow River) Valley, which is frequently referred to as the "Mother River" in China. These civilizations date back to approximately 4000-5000 years ago. Consequently, rivers have played a significant role in human history.[5]

Rivers are crucial in the advancement of economic, social, political, and religious growth. As human populations increased, early societies discovered that traditional hunting and gathering methods were no longer adequate to provide sufficient sustenance. Rivers have had a important effect on the financial, social, political, and religious

[1]Percy Sykes, (1963), *History of Persia, Vol-1*(London: Macmillan & Co Ltd, New York St Martins's Press), 36.
[2]Zhang Zhiman & Zhang Xianyu, (2021), "Study on landscape design of urban riverside green space based on environmental behavior Take the small garden of Nanchuan East Road in Xining City as an example"*IOP Conference Series: Earth and Environmental Science.* 768. 012149. 10.1088/1755-1315/768/1/012149.
[3]K.U. Sulaiman, (2016). *Civilization: History, description, common characteristics and importance*. Zes Rokman Resources.
[4]A. Vianello, (Ed.). (2015). *Rivers in Prehistory*. Archaeopress. https://doi.org/10.2307/j.ctvr43kqb

[5]Asit Biswas, (2022), "River: A new multidisciplinary, multisectoral, and multi-issues journal exploring all aspects of rivers from sources to seas", *River. 1.* 10.1002/rvr2.9

progress of humanity, in addition to being crucial to the establishment of civilization.[6] Rivers provide convenient access to water resources and serve as a medium for transporting goods from industrial facilities to other centers. The development of the American West was facilitated by the diversion of Colorado River waters through significant technological and engineering advancements. Steamboats and steamships are extensively utilized for the transportation of individuals and commodities.[7]

Egyptian Civilization

Herodotus stated that Egypt was a gift from Nile[8]. The Nile River serves as a prime example: ancient Egypt began organized irrigation around 3100 BC and appointed an "Irrigation Chief" in 900 BC to oversee irrigation on the Nile's shores and assess agricultural output and tax profits.[9] Moreover, the utilization of rivers is a crucial factor in the advancement of science and technology. Regular flooding of the Nile River meant that the land needed to be surveyed often, which helped shape the early development of geometry.[10]

The early Egyptians originated communities beside the Nile River, building simple homes and practicing farming and raising animals. Taking advantage of the yearly floods of the Nile, they grew vital crops such as wheat to prevent hunger. Over time, most of the Egyptian population moved to the fertile Nile Valley due to its plentiful resources for survival. The Nile River was essential in supporting people, agriculture, and animal husbandry, which determined the growth of ancient Egyptian civilizations. The Nile River served as a significant route for the transportation of people and commodities, particularly among the nations within the Nile Basin. In the past, ancient people used basic wooden boats to trade goods and products along the Nile, but now they rely on big ships. These transactions contributed to economic advancement and led to the formation of the Nile River.[11]

Mesopotamian Civilization

Mesopotamia is a flat area positioned between the Euphrates and Tigris rivers, along with its various branches, including the Great, Little, Diyala, and Khabur Rivers. This geographic zone has served as a home to various communities that have continually advanced and progressed, owing to its fertile plains and well-established

[6]A. Argyrou, & H. Hummels, (2019), "Legal personality and economic livelihood of the Whanganui River: A call for community entrepreneurship", *Water International, 44(6–7)*, 752–768.
[7] Biswas.
[8] J. E.Manchip White, (1970), *Ancient Egypt: Its Culture and History* (London: George Allen & Unwin Ltd, Ruskin House Museum Street),3.
[9]V. Bjornlund, H. Bjornlund, A.F. & van Rooyen, (2020), "Exploring the factors causing the poor performance of most irrigation schemes in post-independence sub-Saharan Africa", *International Journal of Water Resources Development, 36(1),* S54–S101.
[10]B.C. John, &Y. Li, (2007), "Civilization and ecological civilization", *Marxism & Reality, 91(6),* 18–22.

[11]Osama Rashad, "History of The Nile River" Abilogic.com (Online) Jan 08, 2020, https://articles.abilogic.com/409273/history-nile-river.html

irrigation systems. The area called Mesopotamia originates from the Greek terms "mesos" (middle) and "potamos" (river). The historical importance of the both rivers is vast, as they have influenced the growth of many ancient civilizations in the region. Ancient Mesopotamian societies, including the Sumerians, Akkadians, Babylonians, and Assyrians, depended greatly on these rivers for their agricultural achievements and economic wealth. The initial cities in Mesopotamia between 3500-4000 BC were where complex social organizations were noticed for the first time.[12]

Mesopotamia, the area located between the Euphrates and Tigris, did not enjoy the same luck as Egypt. Their fading ancient formations have been covered with sand, mud, and soil for thousands of years. The landscape is scattered with mounds stretching from deserts to swamps. which, interestingly, the Bedouins still called by names that resonated with the traditional names of the cities where they were located, they made a note.[13] Products taken to central and southern Mesopotamia were transported via the Euphrates River. The cities in this area were located near the Euphrates and Tigris Rivers, and irrigation became simpler for farmland, resulting in increased production of cultivated lands. These advancements compelled them to engage in trade with one another to meet society's demands. Babylon's landscape is a level alluvial plain shaped by the Tigris and Euphrates rivers. This area, which is abundant in farm goods, plays a crucial role in commerce. A vast trade network was established early to connect Babylon with neighboring regions in the Near East. Euphrates and other rivers served as the primary channels for trade.[14]

Fish has been the primary meal in Mesopotamia for the past 5000 years, alongside milk and grain. Fish were recognized as one of the foundational resources for early human civilization in the Euphrates and Tigris Rivers, along with their tributaries and the coastal waters of the Arabian Gulf.[15] Fish were not only seen as a meal for the less fortunate but also served in the palace to the rulers of Mesopotamia.[16]

Yellow River Civilization

The Yellow River has exerted a profound influence on shaping the historical development and cultural landscape of Chinese civilization. The land has been nurtured by the waters, which has helped with farming techniques and allowed for the development of ancient societies. The river basin has been home to numerous dynasties, highlighting its implications in China's history. According to ancient Chinese philosophy of the five elements,

[12]Yilmaz Ensar, (2022), "Yapısal Özellikleri Açısından Antik Mezopotamya'da Kent ve Kentleşme", *Social mentality and researcher thinkers journal*, 62(62):1449-1453. Doi: 10.29228/smryj.63940
[13]A. Leo Oppenheim, (1977), *Ancient Mesopotamia: portrait of a dead civilization* (Chicago: University of Chicago Press), 8.
[14] Savas. Altun, (2015), "the Reflection of Mesopotamia Water Transportation to Figurative Arts", *International Journal of Environment and Geoinformatics.* 2. 57-60. 10.30897/ijegeo.303563
[15]Laith Jawad, (2006), "Fishing Gear and Methods of the Lower Mesopotamian Plain with Reference to Fishing Management", *Marina Mesopotamica Online*. 1.
[16]J. N. Postgate, (1994*), Early Mesopotamia* (United Kingdom: London, Routledge),567.

water was considered the most significant element, and it interacted with fire, wood, metal, and earth to constitute all matter.[17] China, although predominantly reliant on agriculture, has a documented urban history that spans over the period four thousand years. The origins of early civilizations can be traced to the middle and lower basins of the Yellow River.[18]

Thus, in the early stages of Chinese civilization, cities were strategically positioned close to prominent rivers, particularly the Yellow and Yangtze River basins. This architectural pattern persisted throughout history, with major ancient urban centers such as Anyang, Chang'an, Luoyang, Kaifeng, Nanjing, Hangzhou, and Beijing situated adjacent to waterways. For instance, Anyang, China's oldest capital, extends along the banks of the Heng Shui River. For 1,700 years under 13 dynasties, Chang'an (now Xi'an) was strategically situated near eight rivers, including Wei, Jin, Lao, and Feng, serving as the capital city. Similarly, Kaifeng is situated on the Yellow River and Huai River, whereas Nanjing is located on the southern bank of the Yangtze River. This strategic location helped these ancient Chinese cities thrive by providing access to water, transport, and agriculture, leading to their growth and prosperity.[19] Nearby rivers provide the city with an accessible water supply and irrigation, thereby facilitating transportation. However, the city also faced significant flood risks from rivers. As a result, ancient city founders and leaders have prioritized efforts to mitigate urban flooding.[20]

Indus Valley Civilization

The Indus Valley Civilization, which flourished along the Indus River in northwestern India between 3000 and 1500 B.C.E., was one of the most significant and advanced civilizations of the ancient world. Archaeological evidence of this civilization has been discovered in Sindh, Punjab, and Baluchistan in Pakistan; in the states of Haryana and Gujarat in India; and in Afghanistan, Turkmenistan, and Iran. The initial urban center excavated was Harappa, located in present-day Pakistan, leading to the alternate designation of this ancient society as the Harappan Civilization. Harappa and Mohenjo-Daro were the two main places discovered in the initial stage of the twentieth century.[21] The Indus Valley Civilization is a city-based civilization located in the plains, founded around the Indus River and its tributaries, with an economy dependent on farming, manufacturing, and commerce. Similar to the Nile River in Egypt, the Indus River also offers nutrient-rich soil required for agriculture because of its regular yearly floods. Nevertheless, an important feature of the Indus Valley Civilization was its urban centers. Unlike the cities in Mesopotamia, Egypt, and ancient China, which grew naturally, cities in the Indus Valley Civilization stand out for their reliable town planning.[22]

[17]Z. Dong, (2019). *Eco-hydraulic engineering* (China Water Power Press).
[18]X.Y. Zheng, (2015) "The ancient urban water system construction of China: the lessons from history for a sustainable future", *Int. J. Global Environmental Issues*, Vol. 14, Nos. 3/4, pp.187–199.
[19]H.C. Jin, (2005) "City and water in ancient China: with case of old capital cities", *The Journal of Hai He University*, Vol. 7, No. 4, pp.23–27.
[20] Zheng.
[21]Nalini Rao, (2019), *Indus Valley Civilization*. 10.1007/978-94-024-1036-5_251-1.
[22]K. Antonova, G. Bongard-Levin, G. Kotovsky,(1079), *A History of India*. Vol. I. (Moscow: Progress

Scholars believe that the economy of the Indus Civilization depends on agriculture and trade. Furthermore, they discussed the ship-building technology essential for both overland and international travel (notably, ships from Meluhha, identified with the Indus, were found in Mesopotamian ports). Although bullock carts may appear as a sluggish form of communication, they were considered a dependable means of transport 3,300 years ago. It is suggested that the Indus Valley Civilization could have been the pioneering civilization in utilizing wheeled transportation.[23] In addition, the civilization of the Indus Valley undertook the domestication of a considerable number of animals to ease agricultural activities. The Indus farmers used oxen to pull carts and plows, whereas cows were a source of milk. These two groups of livestock served a crucial function in providing sustenance for the population of the Indus Valley Civilization. Although oxen is the primary animal carrying loads in the Indus region, donkeys and Bactrian camels with two humps were also selectively bred and utilized for the same purpose. Furthermore, water buffaloes, goats, sheep, and pigs have been domesticated to contribute to the agricultural practices of civilization.[24]

The current Indus region experiences a reduced amount of rainfall compared to historical eras, resulting in decreased fertility, in contrast to the flourishing period of the Indus Valley Civilization. The heightened rainfall levels, in combination with the annual inundation of the Indus River, have contributed significantly to the fertility of the region. Evidence from archaeological findings of safety walls constructed from fired bricks suggests that floods arise on a yearly basis, providing the inhabitants of the Indus Valley Civilization with nutrient-rich soil essential for agricultural activities.[25] The main crops that were farmed by ancient civilizations living in the region of the Indus Valley included numerous species of wheat and barley. The inhabitants observed a farming practice referred to in modern times as rabi cultivation, wherein seeds were planted in the flood plains around November. Subsequently, preceding the onset of the spring floods in April, farmers would proceed to reap their wheat and barley yields. Furthermore, civilization dwelling in the Indus Valley started the cultivation of various other types of cereal grains, introducing different varieties of millets into the agricultural landscape across multiple locations.[26] The unknowable decline of the Indus Valley Civilization occurred during the period from 1900 BCE to 1700 BCE, characterized by the deterioration of urban hubs and migration of inhabitants towards the eastern regions. Numerous theories have been proposed, including the possibility of an Indo-Aryan influx or geological cataclysms;

Publishers),16-
19.

[23]Yousaf Shaheen, (2018), *The Story of The Ancient Indus People Mohenjo-Daro – Harappa* (Pakistan: Culture and Tourism Department, Government of Sindh, Karachi), 13.

[24]Irfan Habib, (2015), *A People's History of India Vol. 2: The Indus Civilization*. 9th Edition (New Delhi: Tulika Books),27.

[25]A. K. Dani, & B. K. Thapar, (1992), *The Indus Civilization in History of Civilizations of Central Asia Vol. I: The Dawn of Civilization: earliest times to 700B.C.* (Paris: UNESCO Publishing),274-275.

[26]Habib, 24-27.

however, no definitive answer has been obtained. As the timeline approached 1700 BCE, key urban centers were deserted, leading to the downfall of this ancient civilization.[27]

Roads as Catalysts for Civilization's Progress

The need for the movement and exchange of material goods, the search for new territories, and the dissemination of cultural characteristics as integral apparatuses of civilizational principles began in ancient times. The original pathways, primarily established by animals and subsequently modified by humans, are regarded as the earliest. These primitive roads initially directed individuals from one dwelling to another, then to water sources, and eventually to grazing land and agricultural fields. The emergence of large-scale human migrations, predating ten millennia, played a significant role in the formation of the earliest transportation networks. Remnants near water reservoirs in Jericho, dating back to approximately 6000 BC, have been recognized as some of the oldest road structures. The introduction of the wheel, leading to the development of initial carts around 3000 years BC, is considered a milestone that compelled humans to adopt deliberate and systematic approaches to road infrastructure, eventually evolving from carts to carriages.[28]

Transportation is an enduring aspect of human civilization. The progress of civilization as a whole was linked to the implementation of drilling techniques and the construction of roads aimed at enabling communication to particular locations. Roads are vital for enabling the transportation of individuals, products, and services between different locations. They are crucial for any economy, linking cities, towns, and villages and enabling trade, communication, and transportation. Roads serve as channels of interaction connecting different places, regions, populations, and civilizations. Certain roadways are short-lived in nature, whereas others have enduring significance in the annals of human civilization.[29] Roads, as one of the most significant human infrastructures, play a crucial role in the maintenance of society and extend throughout every region of the nation. Their presence influences the scale of urban development and functionality. Furthermore, it serves as a framework for overall economic advancement by regulating commerce and the dissemination of ideas. Undoubtedly, the existence of a

[27]Stephanie Guerin-Yodice, "The Indus River Valley Civilization & The Vedic Age of India (CA. 3000 BCE – 700 BCE)," in *History of Applied Science & Technology: An Open Access Textbook*, eds. Danielle Skjelver, David Arnold, Hans Peter Broedel, Sharon Bailey Glasco, and Bonnie Kim (Grand Forks, ND: The Digital Press @ UND, 2021). https://press.rebus.community/historyoftech/part/chapter-2-the- indus-river-valley-civilization-and-the-vedic-age-of-india-ca-3000-bce-700-bce/ for the web version.

[28] Riste TEMJANOVSKI, Janka DIMITROVA, & Monika ARSOVA, (2017), "THE ROADS AS CIVILIZATION SYMBOL OR BRAIN DRAIN BOOSTER: CULTURE CHANGES IN SPIRIT OF GLOBAL CHALLENGES", Journal *of Economics*, [S.l.], v. 2, n. 1, p. 11-23, ISSN 1857-9973. Available at: <http://js.ugd.edu.mk/index.php/JE/article/view/1931>.

[29]Ahmad Hasan Dani, (1992), "Significance of Silk Road to Human Civilization: Its Cultural Dimension" *SENRI Ethnological Studies*, Vol.32, 21–26.

structured society axes on the existence of roads, which have been established and managed throughout the annals of history.[30]

The Silk Road

The term "Silk Road" was introduced by German cartographer F. von Richtofen in 1877, although it designates an ancient commercial network. This pathway facilitated the transportation of Chinese silk to affluent Romans who incorporated Eastern spices into their culinary practices. The exchange of goods occurred bidirectionally, potentially leading Indo-Europeans to introduce written languages and horse-drawn chariots to China. Known as one of the most ancient international trade routes globally, it spans approximately 4,500 km (2,800 miles).[31]

The Silk Road extended across the Asian continent and represented a manifestation of global trade during an era when the known world was comparatively smaller yet more challenging to traverse than the contemporary period. This network predominantly comprised terrestrial routes, but also incorporated maritime passages, extending from China to Korea and Japan in the east, and connecting China via Central Asia to India in the south, as well as to Turkey and Italy in the west. The Silk Road network has persisted for more than two millennia, with specific pathways evolving over time. Throughout history, valuable commodities such as silk, cotton, wool, glass, jade, lapis lazuli, gold, silver, salt, spices, tea, medicinal herbs, various foodstuffs, fruits, flora, equines, musical instruments, as well as architectural, philosophical, and religious concepts have been utilized.[32] This link is not only about the trade of material products. Furthermore, an exchange of social, religious, and philosophical ideas, languages, and novel technologies occurred concurrently. Regrettably, diseases also propagated along this route. It is hypothesized that the Silk Road played a substantial role in the dissemination of the Black Plague, which entered the region. During the 14th Century, the Bubonic Plague spread from Asia to Europe and resulted in the deaths of more than 20 million Europeans, comprising about one-third of the population.[33]

While silk played a vital role in linking trade routes, it was just one of the many goods that traveled along the vast Silk Road network. Ivory, gold, pomegranates, safflowers, and carrots were traded from Rome to the east. In exchange, the east provided jade, furs, ceramics, and luxury goods, such as bronze, iron, and lacquer. The journey involved a variety of animals, such as horses, sheep, elephants, peacocks, and camels, through which agricultural innovations, metallurgical techniques, knowledge, and religious beliefs were spread by the travelers, possibly having a noteworthy influence on the exchange.[34] The Silk Road flourished and potentially reached its zenith

[30] TEMJANOVSKI.
[31]Mukesh Kumar Mishra, (2020),"The Silk Road Growing Role of India,"
Leibniz Information Centre for Economics. <https://ideas.repec.org/p/zbw/esprep/216099.html>
[32]Richard Kurin, The Silk Road: connecting cultures, creating trust: the 36th annual Smithsonian Folklife Festival on the National Mall, Washington, D.C., June 26-30, July 3-7, 2002. Pg,23. Smithsonian Folklife Festival (36th : 2002 : Washington, D.C.); Smithsonian Institution. Center for Folklife and Cultural Heritage; Silk Road Project, Inc
[33] Mishra.
[34] K. Kris Hirst, "The History and Archaeology of the Silk Road", *ThoughtCo*, Feb. 11, 2020, thoughtco.com/along-the-silkroad-167077

during the Tang dynasty of China, which spanned from 618 to 907 A.D. Following the decline of the Tang dynasty in 907 A.D., the Ming dynasty emerged in the period from 1368 to 1644 A.D. Political unrest in China resulted in an economic downfall and reduced capacity to import luxury goods. successfully blocked access to China.[35]

Romans Roads

The Roman Empire constructed approximately 53,000 miles of roadways connecting the capital to its extensive territorial holdings. The inception of these important routes started in Rome and split out in all directions, enabling trade, communication, a transportation, and allowing the swift deployment of Roman army. These road networks covered the empire as a complicated framework, uniting various regions encircling Italy, Germany, France, Spain, and even extending to the northern reaches of Britain. Towards the eastern and southern regions, these roads unified the Balkans, Greece, Turkey, the Near East, and North Africa, incorporating territories such as Egypt and Tunisia.[36]

The Roman Road network began its growth alongside the rise of Roman influence in the 4th century B.C. The chief motive behind the development roads was predominantly military in nature: the necessity to swiftly mobilize forces to the vulnerable frontiers of the Empire. The earliest consular Roman road established for strategic purposes was the Via Appia (the Appian Way), which was attributed to the Roman censor Appius Claudius Caecus and was completed in 312 B.C. It extended in a southeastern direction from Rome to Capua (in proximity to Naples), with the objective of ensuring a continuous supply of fresh troops for the conflict against the Samnites.[37]

Royal Road of Persia

The Persian Empire's Royal Road System was a system of roads, and the exact routes of this system have long been a topic of difference for scholars. The characteristics of the Royal Road can be acknowledged in both Herodotus's History and the Persepolis Administrative Archives. Overall, the paths of the Royal Road System in Anatolia, Mesopotamia, Syria, and Armenia were fairly accurate.[38] King Darius constructed a road to enhance communication in the western region of his kingdom. Archaeological evidence suggests that portions of the westernmost section of the road were potentially constructed by Assyrian rulers and subsequently maintained by Darius. According to the ancient Greek historian Herodotus, the Royal messengers were able to journey the entire

[35]Mishra.

[36]Richard W. Steiger, "ROADS OF THE ROMAN EMPIRE: Roman concrete and road-building technology contributed to the amazing endurance of ancient Roman roads", Materials.com Online November, 01,1995, https://www.concreteconstruction.net/how-to/materials/roads-of-the-roman-empire_o

[37]Luca De Benedictis & Vania Licio & Anna Maria Pinna, (2023),"From the historical Roman road network to modern infrastructure in Italy," *Journal of Regional Science*, Wiley Blackwell, vol. 63(5), pages 1162-1191, November. <https://ideas.repec.org/a/bla/jregsc/v63y2023i5p1162-1191.html>

[38] Li Yiming,(2022), "An Analysis of Routes of the Royal Road System in the Persian Empire—on the Function and Limitation of Classical Texts", *Historical Geography Research*, 42(4): 50-67

road in nine days. The mean duration of travel along the road was approximately three months. Alexander the Great utilized the Royal Road during his military campaign to conquer the Persian Empire.[39]

Grand Trunk Road

The renowned Grand Trunk Road, also known as *Shahrah-i-Azim*, links Calcutta in India to Peshawar in Pakistan and boasts a rich history spanning 2,500 years.[40] Regarded as the most significant thoroughfare in the region, academics have drawn parallels with other historical routes like Pilgrim's Way in England, the Appian Way in Rome, and *Jada-i-Shah* of the Achaemenians.[41] This route has not only seen the exchange of products within the region and abroad but has also helped spread cultural, religious, and social aspects to far-off regions. Since the Mauryan dynasty (322 BC– 185 BC), it has been influential in shaping India's political and economic structure. Moreover, it facilitated the medieval rulers to maintain peace and unity in India.[42]

During the medieval era, roads played a decisive role as a connecting link for trade and communication throughout the Sur Empire. Over time, roads began to make important contributions to the empire's economy. Specifically, the integration of key roads with *qasbas* (urban settlements) improved the reach of royal authority to the villages, thus streamlining revenue collection processes. With the formation of robust local administrative systems, emphasis on constructing roads has grown, aiming to ease effective and speedy communication channels.[43] The Grand Trunk Road in North India has been instrumental in the urbanization process, leading to the growth of numerous towns and *qasbas* along its path. There is a debate among historians about whether the areas were advanced prior to or following the building of the road.

The Inca Road

The Inca Empire, the final among a sequence of advanced cultures in precolonial South America, prolonged over regions of present-day Argentina, Bolivia, Chile, Colombia, Ecuador, and the entirety of Peru. Spanning 30,000 km, Inca Road served as its extensive transportation network. The Inca Road has held an important historical worth in the region, playing a crucial role during the Inca Empire and becoming vital to the economy during Spanish rule in South America. In contrast to aspects such as Incan agriculture or language, the Spanish colonizers incorporated the road system into their commerce-oriented economy, integrating it with their institutional structures. As a result, it became a fundamental component of the colonial economic system in the New World.[44] The Inca Road track

[39]Britannica, T. Editors of Encyclopaedia (2022, June 23). *Persian Royal Road*. *Encyclopedia Britannica*. https://www.britannica.com/topic/Persian-Royal-Road. https://www.britannica.com/topic/Persian-Royal-Road

[40] K.M. Sarkar, (1926), *The Grand Trunk Road in the Punjab: 1849-1886*(Lahore: Punjab Government Record Office Publications), 8.

[41]Sarkar,7.

[42]Nasir Raza Khan, (2017), "Grund Trunk Road: Continuity and Changes", *International Journal of Applied Research*, 3(1): 55-58.

[43] Khan.

[44] Ana Paula Franco, Sebastian Galiani and Pablo Lavado, (June 7, 2021), "Long-Term Effects of the Inca Road",*NBER Working Paper* No. 28979 July 2021 JEL No. O1 Available at SSRN: https://ssrn.com/abstract=3871970 or http://dx.doi.org/10.2139/ssrn.3871970

was influenced by social, economic, and geographical factors. The key was the empire's imperative to access conquered communities. Consequently, the road net was strategically designed to link important towns by permitting the movement of troops, officials, and *chasqui*s messengers. Additionally, it helped in the transportation of valuable products, such as metals and agricultural goods, by connecting vital production sites across the empire.[45]

One Belt One Road

As the Nile, Indus, Tigris-Euphrates, and Yellow Rivers fostered trade, agriculture, and urban centers in early societies, historical road networks such as the Silk Road, Roman roads, and the Grand Trunk Road facilitated economic expansion and cultural exchange across continents. The BRI emulates this historical pattern, functioning as a modern Silk Road by enhancing global connectivity through extensive infrastructure projects spanning Asia, Africa, and Europe. Analogous to ancient roads that enabled empire-building and trade dominance, it aims to reconfigure global trade routes, integrating economies through highways, railways, and maritime corridors. However, while ancient roads primarily connected regional economies, it operates on an unprecedented global scale, reflecting the transition from localized trade to a highly interconnected world economy.

In 2013, President Xi Jinping of the People's Republic of China announced The Belt and Road Initiative (BRI), also known as One Belt One Road (OBOR). This initiative encompassed the revitalization of the ancient Silk Road and aimed to connect Asia, Europe, Africa, and the Middle East through the establishment of investment and trade networks, as well as the creation of new institutional linkages. The BRI has the potential to facilitate trade, enhance resource allocation efficiency, and promote economic growth across the region. Furthermore, it may encourage participating countries to align their economic policies and foster regional cooperation.[46]

[45] Franco.

[46]Maryla Maliszewska, and Dominique van der Mensbrugghe, (April 10, 2019), "The Belt and Road Initiative: Economic, Poverty and Environmental Impacts", *World Bank Policy Research Working Paper* No. 8814, Available at SSRN: https://ssrn.com/abstract=3369989

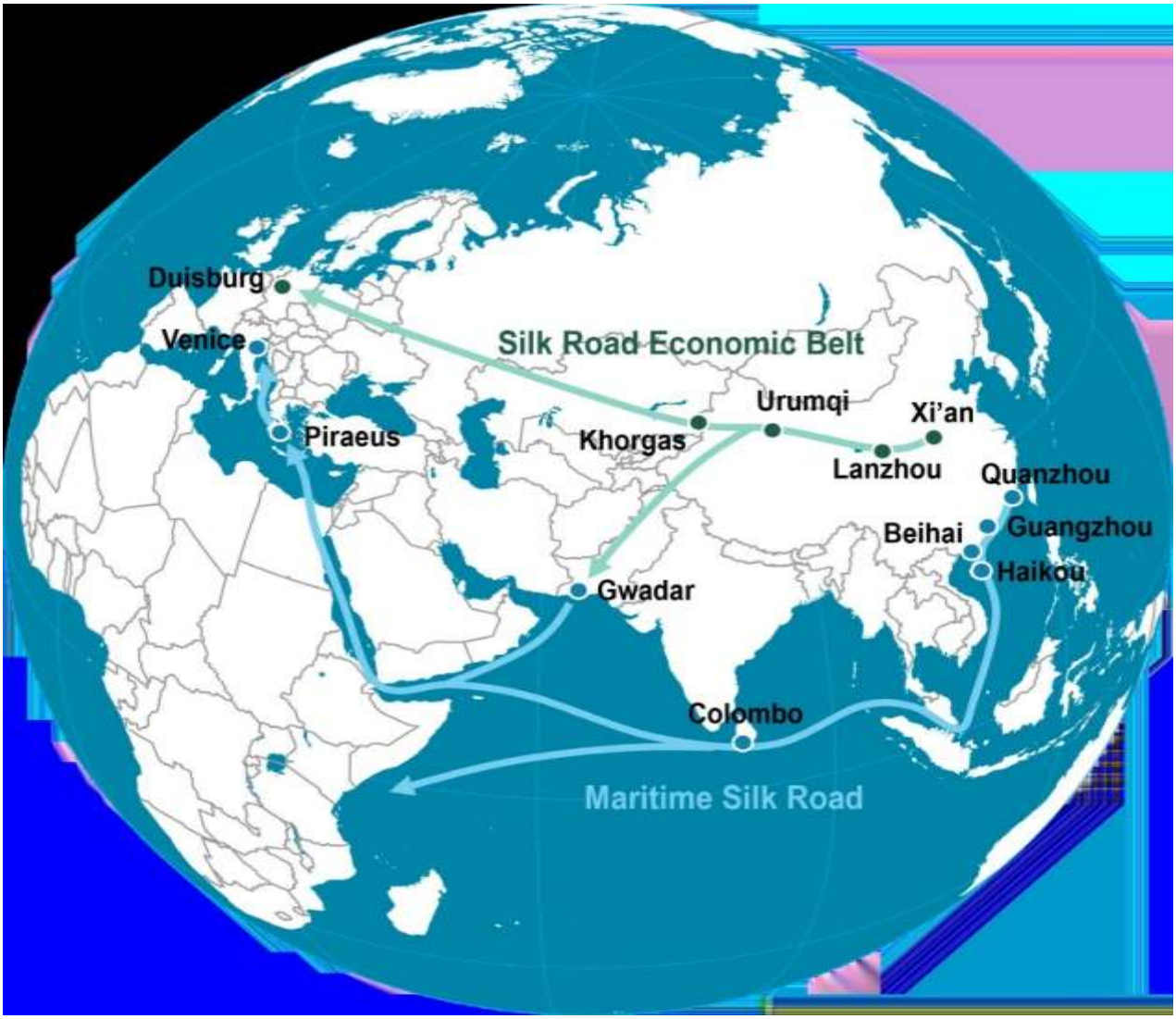
China Proposed BRI Map[47]

The strategic framework for the collaborative development of the Silk Road Economic Belt and 21st-Century Maritime Silk Road outlined five fundamental priorities: policy coordination, infrastructural connectivity, facilitated trade, financial integration, and interpersonal connections.[48] The goal of the BRI is to make it easier for Central Asian countries to link lands. The Road emphases the coastal areas of Southeast and South Asia. Middle East, East Africa, and Mediterranean regions The BRI drawings show the massiveness of planets. The initiative comprises a Digital, a Polar, and a Space Silk Road, making it a model of a new worldwide approach to development focused on infrastructure.[49]

[47] https://www.thejakartapost.com/academia/2019/05/13/insight-seeking-global-cooperation-through-belt-and-road-initiative.html

[48] NDRC (2015), *Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road*, Beijing, China: Foreign Languages Press.

[49]S. Schindler, J.M. Kanai, (2021), "Getting the territory right: infrastructure-led development and the re-emergence of spatial planning strategies", *Regional Studies* 51, 40-51.



BRI.[50]

Chinese-led investments in infrastructure initiatives across Southeast Asia, Central Asia, Eastern Europe, and Africa have facilitated economic development and enhanced employment opportunities in recipient nations. However, these investments have also faced considerable scrutiny and condemnation, characterized by terms like "debt trap" and "neo-colonialism" from Western nations. Nevertheless, China's BRI has knowingly influenced the global economic and political landscape by incorporating 131 countries into its extensive infrastructure investment program as of April 2019.[51]

[50] https://porteconomicsmanagement.org/pemp/contents/part2/port-hinterlands-regionalization/belt-and-road-initiative-bri/

[51] Alex He, (2020), "The Belt and Road Initiative: Motivations, financing, expansion and challenges of Xi's ever-expanding strategy", *Journal of Infrastructure, Policy and Development*, 4(1): 139–169. doi: 10.24294/jipd.1180

By integrating extensive infrastructure projects with industrial initiatives and important investments in urban development, the BRI redesigned cities into hubs for finance, tourism, and trade. It furnaces innovative connections between urban areas, initiates the formation of new cities, and changes the urban landscape, exerting an unparalleled effect on global development.[52] The estimated total investment in the initial phase of the Road Initiative was approximately $240 billion USD. However, this figure is an initial estimate of project expenses subject to variation based on factors such as the number of joining countries and the scope of sectors involved.[53] For an extended period, China has maintained a policy of non-intervention towards Central Asia, refraining from interference or asserting its influence, even during the Cold War when the United States and Soviet Union were in conflict. China has surpassed Russia as the region's primary trading partner.[54] Russian economic influence has diminished, and the Central Asian Republics are no longer considered subordinate states of Russia. China has rapidly become the world's leading oil importer, and this trend is expected to continue due to its predominantly export-oriented economy, particularly in the energy sector, which is a crucial component for the country's economic growth and development.[55]

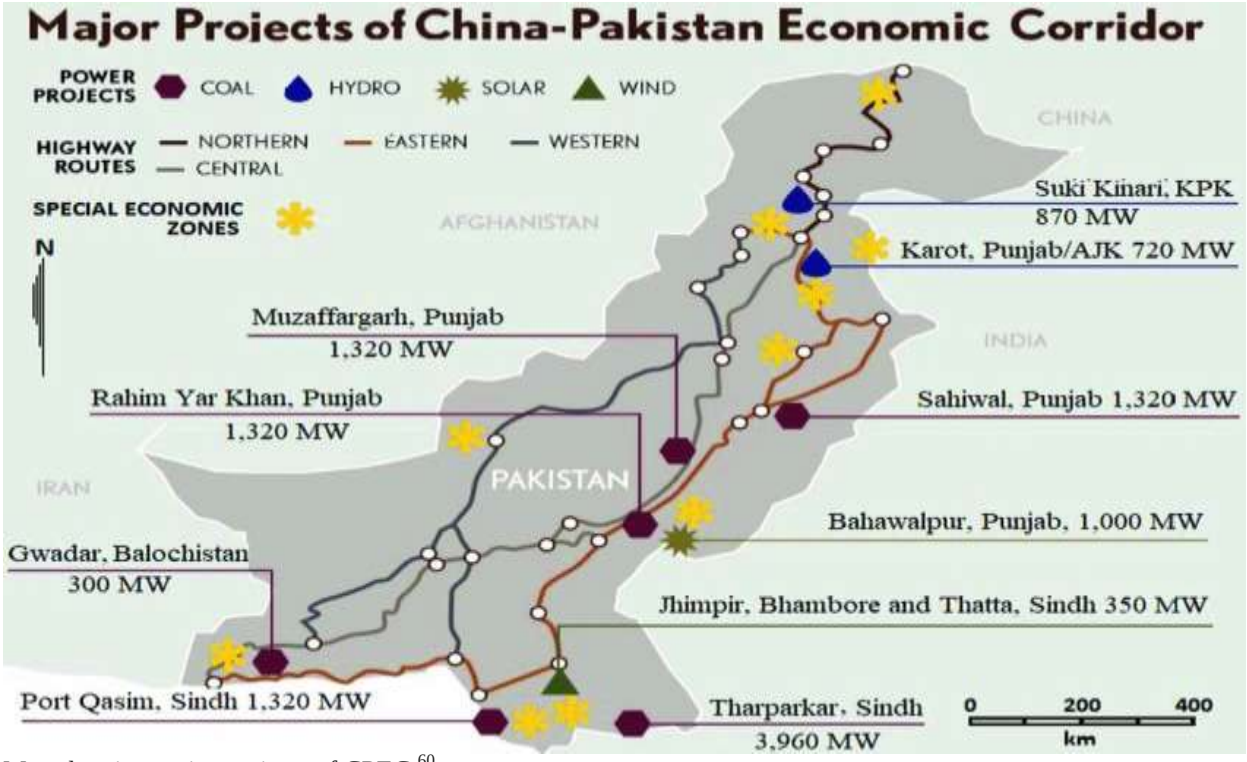
While some perceive the OBOR to be similar to the Marshall Plan, it is not entirely accurate. The Marshall Plan's objectives stretched beyond infrastructure development and included countering the Soviet bloc's influence. Moreover, the Marshall Plan was an inclusive strategy administered solely by the USA. In the context of OBOR, funding comes from the recently established Asian Infrastructure Investment Bank (AIIB), which boasts of more than 50 member nations. This method spreads the risk related to the OBOR across countries.[56] China's contemporary Silk Road initiative comprises two primary components: the Silk Road Economic Belt and the Maritime Silk Road. Its purpose is to improve its impact across Asia, Europe, and Africa by bolstering trade, investment, and connectivity. This effort incorporates both physical infrastructure such as extensive networks of transportation routes and intangible infrastructure such as policy coordination to foster economic activities. China has committed a significant USD 1 trillion to this initiative, allocating approximately USD 85 billion annually for development finance, suggesting an important investment in regional development and cooperation.[57] China claims that the BRI generates mutually beneficial outcomes for itself and its partners. Developing nations, according to

[52] University of Cambridge Institute for Sustainability Leadership (CISL). (2022). *China's Belt and Road Initiative: Sustainability in the New Silk Road*. Cambridge, UK: University of Cambridge Institute for Sustainability Leadership.
[53] P. Wolff, (2016), China's "Belt and Road" Initiative—Challenges and Opportunities, *German Development Institute, Bonn.*
[54]T. Jinchen, (2016), "One Belt and One Road": Connecting China and the world", *Mackinsey & Co. capital Projects and Infrstructure*, 15-26

[55] Umbreen Javaid and Mir Waheed Akhlaq, (2018), "Situating Central Asia in China's One Belt One Road Initiative", *Journal of the Punjab University Historical Society*, Volume No. 31, Issue No. 2.
[56] S.M. Hali, T. Shukui, T. and S. Iqbal, (2015), "One Belt and One Road: Impact on China-Pakistan Economic Corridor", *Strategic Studies*, 34-35, 147-164.
[57]Ammar A. Malik, et al. "Banking on the Belt and Road: Insights from the new global dataset of 13,427 development projects." AidData. 2021. https://docs. aiddata.org/ad4/pdfs/Banking_on_the_Belt_and_ Road__Insights_from_a_new_global_dataset_ of_13427_Chinese_development_projects.pdf

China, will have immediate requirements for advancing bearable development through the BRI's bilateral agreements and multilateral collaborations.

China has progressively emerged as Pakistan's primary trading partner, demonstrating consistent trade in both exports and imports. Bilateral trade and commercial relations between the two nations were initiated in January 1963, when they entered into their first long-term trade agreements.[58] Recently, China has emerged as the most vital trading partner for Pakistan. Trade volume between the two nations amounted to US$ 5.2 billion in 2006, subsequently reaching US$ 16 billion in the previous year, demonstrating a substantial annual growth rate of 12.57%. The two countries have mutually committed to increasing their bilateral trade to $20 billion within the next three-year period. The ongoing drive for their diverse collaborative relationships is stressed by continuous growth, which has been fostered through regular bilateral interactions at various levels.[59]



Map showing major projects of CPEC.[60]

The CPEC functions as a conduit for the Advanced Maritime Silk Road, envisioning connections among three billion individuals across Asia, Africa, and Europe. As a principal initiative of the Belt and Road, the CPEC aims

[58]Ministry of Finance, (2014). Pakistan Economic Survey 2013-2014. - 08-Trade and Payments colour (finance.gov.pk)
[59]Muhammad Saqib Irshad, Qi Xin, & Hamza Arshad, (2015), "One Belt and One Road: Does China-Pakistan Economic Corridor benefit for Pakistan's Economy", *Journal of Economics and Sustainable Development*, 6. 200-207.
[60] https://www.researchgate.net/figure/Map-showing-major-projects-of-China-Pakistan-Economic-Corridor-13-14-15-16_fig1_327638000

to revitalize the ancient Silk Road, prioritize infrastructure development, and establish a strategic agenda for bilateral partnership. The magnitude of infrastructure development and financial agreements within the CPEC has been unprecedented in Pakistan's history. BRI-initiated investments have nearly equaled 50 years of US economic and military aid (1951-2011) and surpassed the volume of foreign direct investment in Pakistan over the last decade, estimated at USD 23 billion.[61] In the context of the CPEC, China has committed to financing approximately $46 billion in development initiatives, which is equivalent to approximately 20 percent of Pakistan's annual GDP.[62]

The comprehensive plan for the CPEC in the long run 2017-2031 includes the following projects: Connectedness via a unified transportation system, network infrastructure for information, power, commerce and manufacturing parks, farming progress, travel industry, and collaboration in sustainability. and collaboration between the private and public sectors as well as financial, agricultural, and local government support. in farming, along with collaboration among municipal authorities.[63]

The government of Pakistan and various other agencies have eagerly promoted job prospects arising from CPEC, leading to a positive outlook amid the people. It is asserted that the CPEC will create employment opportunities primarily in construction and maintenance sectors. Both governments assert that this measure will stimulate industrialization and job creation. Pakistan-China relations demonstrate enduring permanency, characterized by joint interests and cooperation despite developing circumstances. The worth of the CPEC lies in its potential to elevate existing political ties to a stronger strategic economic alliance. This integration stands to benefit not only China and Pakistan but also the global economy.[64] However, it has also resulted in China gaining control over Pakistan's crucial industrial sectors, which is essential for the nation's progress. China's dominance in these sectors impedes Pakistan's efforts toward national industrialization, limiting prospects for employment and the provision of critical services to the public.

Conclusion

The transition from rivers to roads represents a significant transformation in human civilization, reflecting technological, economic, and geopolitical developments. Rivers served as the foundation of early societies, supporting agriculture, commerce, and urban development, as evidenced in Mesopotamia, Egypt, the Indus Valley, and China. However, as civilizations expanded, roads became essential for long-distance trade, governance, and military control. Networks such as the Silk Road, Roman roads, and the Grand Trunk Road facilitated not only commerce but also cultural and political exchanges, shaping global interactions. This transition also symbolized broader socio-political transformations, as road networks necessitated state investment and administrative control,

[61]Centre for Global Development. “Aid to Pakistan by the Numbers.” September 2013. https://www. cgdev.org/page/aid-Pakistan-numbers & Board of Investment. “Foreign Investment.” https://invest.gov. pk/statistic
[62]Andrew Stevens (2015), “Pakistan Lands $46 Billion Investment from China”, *CNN*, Money, 20 April 2015.
[63] Long Term Plan for China-Pakistan Economic Corridor (2017-2030), https://cpec.gov.pk/long-term-plan-cpec
[64] Irshad.

reinforcing political power and economic integration. In the contemporary era, initiatives such as China's Belt and Road Initiative (BRI) and the China-Pakistan Economic Corridor (CPEC) continue this legacy, emphasizing connectivity as a driver of economic and geopolitical influence. Ultimately, while rivers nurtured early civilizations, roads enabled expansion and global integration. Analyzing this evolution provides valuable insights into the past and aids in contextualizing contemporary infrastructure developments, trade dynamics, and international relations in an increasingly interconnected world.

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