

Specific aspects of transport

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Abstract

The specifics of transport are highly dependent on the type, purpose, and location of the vehicle. Therefore, specific characteristics are determined by a number of very heterogeneous elements. Transport inherently belongs to the category of socio-technical systems with varying degrees of special responsibility. In this regard, the article provides a classification of vehicles. The basic principles of transport organisation in the EU are considered. Attention is paid to the specific features of transport.

Keywords: transport, transport organisation, logistics and intermodality, socio-technical system, elements of transport infrastructure.

1. SPECIAL FEATURES OF TRANSPORT

Transport is the movement of goods and people from one place to another, as well as the various means by which this movement is carried out. The growing ability and need to transport large quantities of goods or people over long distances at high speeds in comfort and safety has become an indicator of the development of civilization and, in particular, of technological progress. Transport is discussed in many articles [1 - 14].

Transport is a broad topic in terms of content. It plays a crucial role in modern society, enabling economic activity, facilitating travel, and connecting communities. The specifics of transport can vary greatly depending on the mode, purpose, and location. Their specific characteristics are defined by a number of highly heterogeneous elements. Transport inherently belongs to the category of socio-technical

systems of special responsibility. Sociotechnical systems (STS) in organizational development are an approach to complex organizational work design that recognizes the interaction between people and technology in workplaces. The term also refers to coherent systems of human relations, technical objects, and cybernetic processes that inhere in large, complex infrastructures. Social society, and its constituent substructures, qualify as complex sociotechnical systems [2]. In such systems, their safety is paramount, followed by economic factors. A special place in this is occupied by the international transport organization.

The organization of the European Union (EU) transport system is based on cooperation between the European Commission, national governments of EU member states and other stakeholders.

The main principles of transport organization in the EU include:

- **Regulatory role of the European Commission:** The European Commission has a regulatory role in setting transport policies and standards at the EU level. It develops legislation aimed at improving the safety, efficiency and sustainability of the transport system.
- **Legislative framework:** The EU has a wide range of legislative acts that regulate transport activities. This includes directives, regulations and orders that cover various aspects of transport, including road safety, environmental standards, passenger and freight transport, intermodal transport, etc.
- **Development of transport infrastructure:** The EU promotes the development of transport infrastructure in its member states. This includes the construction and modernization of roads, railways, airports, ports and other transport hubs. Such projects are coordinated and financed through various EU programs and funds, such as the Trans-European Transport Networks (TEN-T).
- **Intermodality:** The EU supports the development of intermodal transport, which promotes the development of intermodal transport, which helps to ensure the efficient use of different modes of transport (e.g., roads, rail, waterways, air) and their interconnection. This helps to reduce traffic congestion, CO2 emissions and energy dependence, and increases the competitiveness of the transport system.
- **Safety and environmental standards:** The EU sets standards and regulations aimed at improving safety on roads, railways and other modes of transport. It also considers environmental sustainability, setting requirements for emissions, energy efficiency and the development of environmentally friendly transport technologies.

- Funding and support: The EU provides financial support for the development of the transport system, in particular through various funds and programmes, such as the European Regional Development Fund (ERDF), the Connecting Europe Facility (CEF), and others. These funds are used for infrastructure projects, research, innovation, and promotion of the modernization of the transport system.

In general, the organization of transport in the EU is based on cooperation between member states and European institutions to ensure the safety, efficiency, sustainability, and sustainable development of the transport system, contributing to economic growth and convenience. The main specific aspects of transport are shown in Fig. 1.

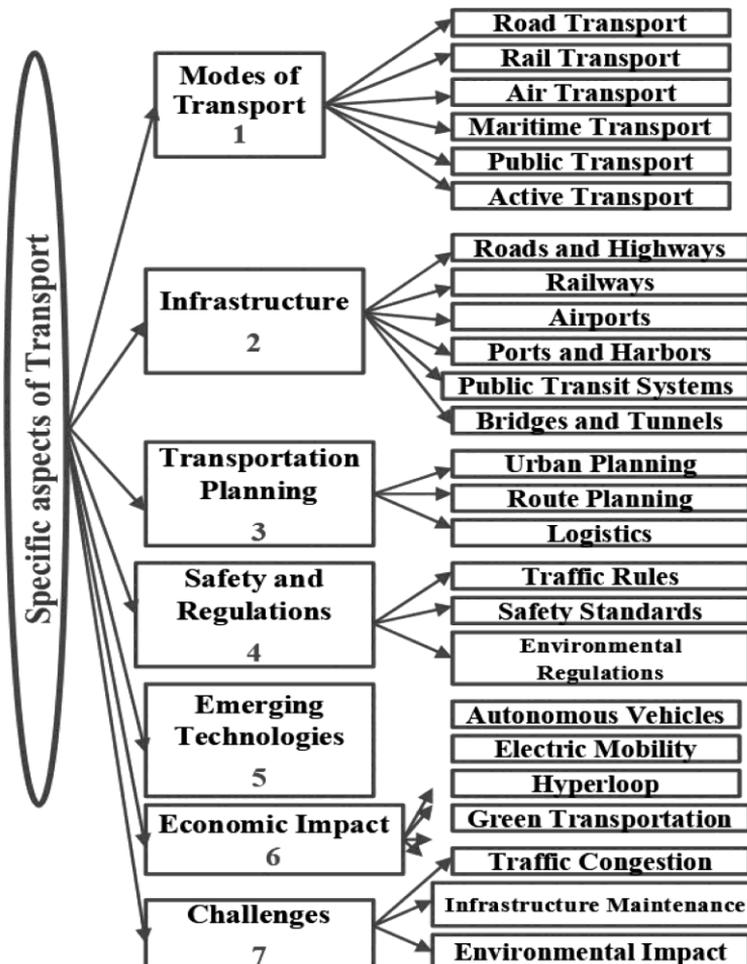


Fig. 1. Special features of Transport

Source: Author

Transportation is a broad topic that encompasses the movement of people, goods, or animals from one place to another. It plays a crucial role in modern society, enabling economic activities, facilitating travel, and connecting communities. Specifics of transportation can vary widely depending on the mode of transport, purpose, and location. Let us look at the main specific aspects of transport, which are shown in Fig. 1.

2. MODES OF TRANSPORT

Means of transport refers to the modes of transport. Mode of transportation (or transportation mode) refers to different ways by which goods or people are transported from one place to the other through land, air, or sea. There are various modes of transport, each with its advantages and disadvantages. Here are some common modes of transport (Fig. 2):

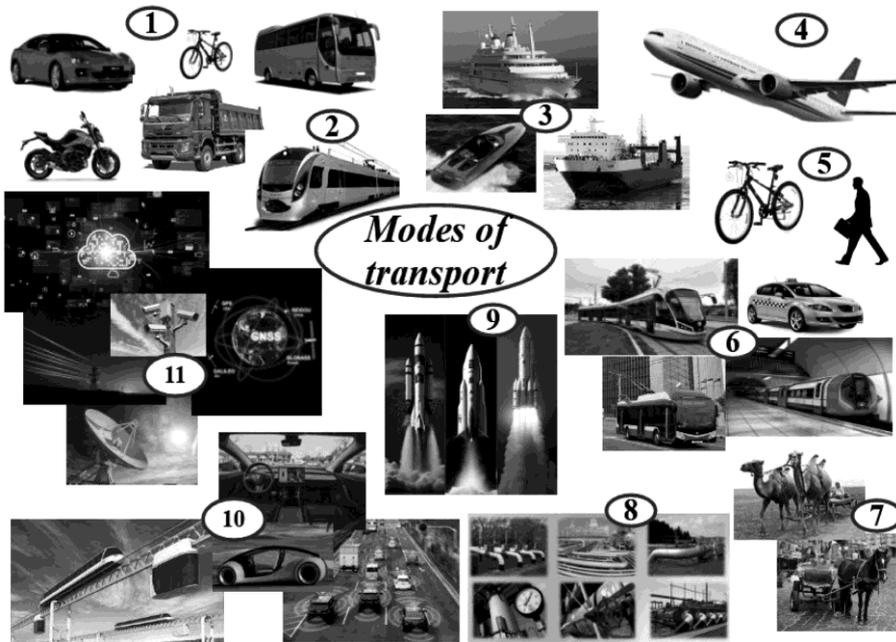


Fig. 2. Modes of Transport
Source: Author

1. Road Transportation:

- Cars and Motorcycles: These are the most common means of personal transportation on roads.

- Bicycles: Environmentally friendly and healthy means of transportation.
- Buses: Public buses and private coaches are used for mass transit.
- Trucks: Used for the transportation of goods and freight over land.

2. Rail Transportation:

- Trains: Efficient for long-distance travel and the transportation of heavy goods and bulk materials.

3. Water Transportation:

- Ships and Boats: Cargo ships, container ships used for transporting goods and people across oceans, seas, rivers, and lakes.
- Ferries and Passenger Ships: Boats and ships that carry passengers and vehicles across bodies of water.
- Cruise Ships: Large vessels designed for recreational voyages.

Maritime transport [Fig. 3], also known as shipping or maritime trade, means the transport of goods, people, or animals by sea. It is an important component of global trade and commerce, facilitating the movement of goods between countries and continents.

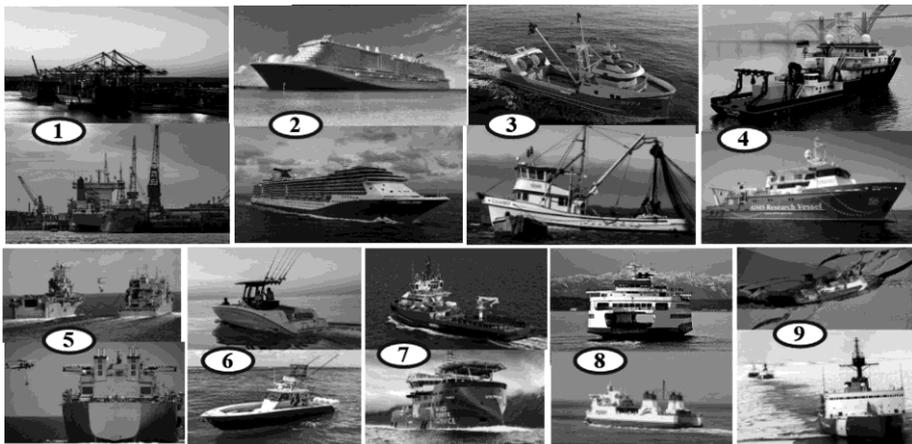


Fig. 3. Modes of Maritime Transport

Source: Author

Maritime modes refer to the various ways in which goods and people can be transported over water. These modes play a crucial role in global trade, transportation,

and commerce. Each of these maritime modes serves specific purposes and contributes to the overall efficiency and functionality of global maritime transportation.

Usually, primary maritime modes include various types of vessels such as:

1. **Shipping:** This is the most common and traditional mode of maritime transport. It involves the movement of goods and cargo on ships. Shipping can be further classified into container shipping, bulk shipping, and tanker shipping, depending on the type of cargo being transported.
2. **Cruise Shipping:** This mode involves passenger ships designed for pleasure voyages, where people travel for recreational purposes rather than for transportation. Cruise ships offer various amenities and activities on board.
3. **Fishing Vessels:** These are boats or ships used for commercial or recreational fishing. They can vary widely in size and are equipped with fishing gear to catch fish and other marine organisms.
4. **Offshore Industry Support Vessels:** These vessels provide support to offshore oil and gas exploration and production activities. They include supply vessels, anchor handling tug supply vessels, and platform supply vessels.
5. **Naval Shipping:** This mode involves the use of warships and submarines for defence and military purposes. Naval shipping plays a crucial role in securing maritime borders and maintaining national security.
6. **Recreational Boating:** This includes various types of small boats and yachts used for leisure activities such as sailing, cruising, and water sports.
7. **Research Vessels:** These are ships equipped for scientific research activities in marine environments. They are used for oceanography, marine biology, and other scientific purposes.
8. **Ferry Services:** Ferries are boats or ships that are specifically designed to transport people, vehicles, and goods across bodies of water, such as rivers or between islands.
9. **Icebreakers:** These specialized vessels are designed to navigate through ice-covered waters. They are crucial for maintaining shipping routes in polar regions.

Transportation is also classified as follows:

- **Freight transport:** Most goods traded internationally are transported by cargo ships. These vessels are designed to carry various types of cargo, from raw materials to finished goods, in bulk or in containers.
- **Container transport:** This is a specialized form of freight transport in which standardized containers are used to transport goods. Containerization has

significantly increased the efficiency of loading, unloading, and moving goods between different modes of transport.

- **Tanker transportations:** Tankers are designed to transport liquid cargoes such as crude oil, petroleum products, chemicals, and liquefied natural gas (LNG).
- **Passenger transport:** Passenger ships and ferries transport people across water for travel, tourism, and commuting.

In addition to commercial shipping, maritime transport includes military vessels, such as warships and submarines, used for defence and security purposes by navies around the world.

Maritime transport plays a crucial role in the global economy as it is a cost-effective and efficient means of transporting large quantities of goods over long distances. Ports and harbours are an important infrastructure for maritime transport, serving as loading and unloading points and logistics centres.

It is worth noting that maritime transport is also strongly linked to environmental and safety issues, and efforts are underway to make it more sustainable and environmentally friendly. This includes initiatives to reduce emissions, improve fuel efficiency and raise safety standards in the maritime industry.

4. Air Transportation

Air transport, also known as aviation, is a mode of transportation that involves the movement of people, goods, and cargo by aircraft through the Earth's atmosphere. It is one of the fastest and most efficient modes of long-distance transportation, including commercial airliners and private jets, and plays a crucial role in connecting people and facilitating global trade. Here are key aspects of air transport:

- **Cargo Transport:**
 - *Cargo Airlines:* Specialized carriers for the transportation of goods by air.
 - *Air Cargo Industry:* Airfreight is crucial for the rapid transport of goods and high-value cargo, including perishable and time-sensitive items.
 - *Freight Airlines:* Airlines specializing in cargo transport operate dedicated cargo aircraft or convert passenger planes to carry freight.
- **Types of Aircraft:**
 - *Commercial Airliners:* Scheduled and charter flights for passenger and cargo transportation. Passenger aircraft operated by airlines for scheduled flights.
 - *Cargo Aircraft:* Planes specifically designed for transporting goods and freight.

- *General Aviation Aircraft*: Smaller private and business aircraft used for various purposes, including personal travel, business, and aerial work (e.g., surveying, photography).
- *Unmanned Aircraft*. The Advisory Council for Aviation Research and Innovation in Europe (ACARE) assumes in the strategic 2011 Agenda1 that cargo planes will be the first to fly fully automated before 2050. Where operational military use of Remotely Piloted Aerial Systems (RPAS) so far was limited to Intel, Communication and Combat (Air-to-Ground) missions, new developments around logistics are explored.
- *Private Jets*: Private aircraft for personal and business travel.
- *Military Aircraft*: Aircraft used by the armed forces for defence and national security purposes.

In [34], a classification of different types of aircraft is given, as shown in Fig. 1.4. To generate lift and thrust, aircraft use a variety of methods and structures, including wings and jet engines. Advances in technology and materials have led to increased efficiency, speed and safety in the design and construction of aircraft.

There are many applications for aircraft, including commercial transport, military operations, scientific research, and entertainment. People can now travel faster and further than ever before thanks to the invention of aircraft, which has completely changed modern transport and cargo capabilities.

Aircraft types: (Fig.4)

1. Fixed wing aircraft
2. Rotary-wing aircraft
3. Balloons
4. Airships
5. STOL (Short Takeoff and Landing) aircraft
6. VTOL (Vertical Takeoff and Landing) aircraft
7. Amphibious aircraft
8. Gliders
9. Biplanes
10. Helicopters
11. Gyroplanes
12. Light-Sport aircraft
13. Parachutes
14. Business jets
15. Floatplanes
16. Tricycle gear aircraft
17. Cargo planes
18. Experimental aircraft
19. Turboprops
20. Military aircraft

Modern aircraft are equipped with advanced technologies, such as specialized equipment and modern avionics.

With the development of technology, aircraft are constantly becoming more capable and efficient in carrying out their missions and various operational logistics tasks.

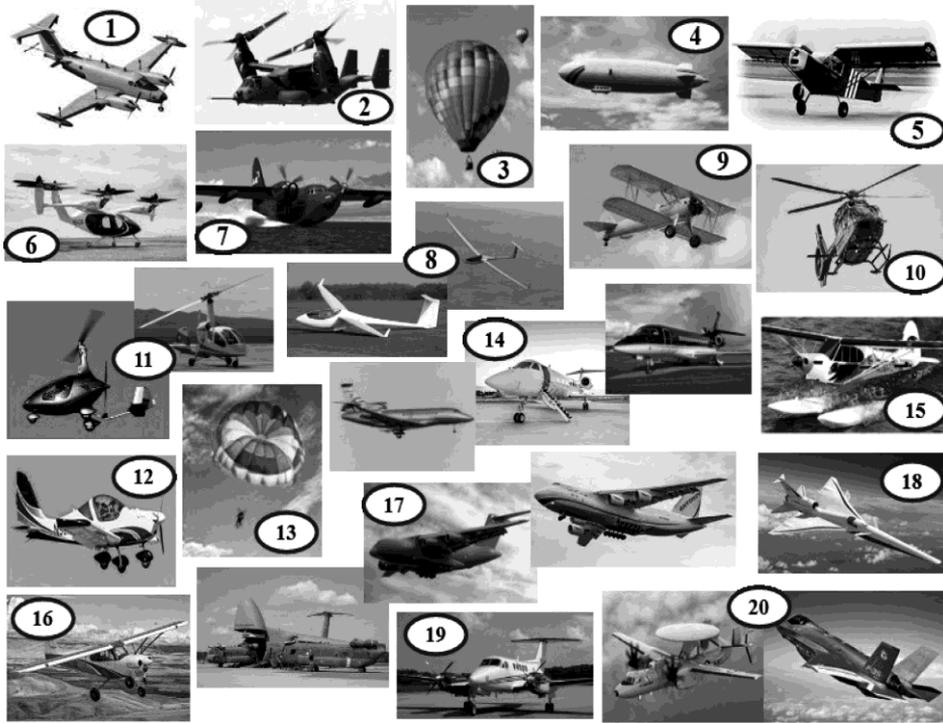


Fig. 4. Different types of aircraft

Source: Author

5. Cycling and Walking:

- Biking: A sustainable and healthy mode of transport for short distances.
- Walking: The most basic and environmentally friendly mode of human transport.

6. Public Transportation:

- Subways and Light Rail: Common in urban areas for mass transit.
- Trams and Trolleys: Used in some cities for local transportation.
- Taxis and Ridesharing: On-demand services for individual or small group travel.
- Carpooling and Vanpooling: Shared transportation options to reduce congestion and emissions.

7. Pipeline Transportation:

- Pipelines: Used for the transportation of liquids (e.g., oil and gas) and solids (e.g., minerals) over long distances.

8. Space Transportation:

- *Rockets and Spacecraft*: Used for space exploration and satellite deployment.
- Vehicles designed for space travel, including satellites, space shuttles, and rockets.
- *Space Exploration Vehicles*: Rovers and landers used for exploring other celestial bodies

9. Animal-Powered Transportation:

- Horses, Carts, and Camels: Still used in some parts of the world for transportation.

10. Innovative Transportation:

- Hyperloop: A proposed high-speed transportation system that uses near-vacuum tubes.
- Electric Scooters and Skateboards: Used in many urban areas for short trips.
- Autonomous Vehicles: Self-driving cars and trucks that may change the future of road transportation.

11. Communication and information systems as a means of transmitting information by electromagnetic waves modulated by signals to solve the problems of monitoring and managing business processes:

- There are systems operated via cable (internet, energy supply), and space (satellite).
- Infrastructure for real-time communication, navigation, and traffic management, including GPS, radar systems, and digital communication networks.

The choice of transportation mode depends on factors such as distance, speed, cost, environmental impact, infrastructure availability, and personal preferences. Different modes are often used in combination to create a comprehensive transportation network in a region.

Infrastructure. Transport infrastructure consists of the physical facilities, structures and systems that support and enable the movement of people, goods and information within a region or country. It is a critical component of any transport system and plays a significant role in the efficiency, safety, and accessibility of transport. Transport infrastructure can include different elements, depending on the mode of transport and the specific needs of the region. Here are some key components of transport infrastructure:

- *Roads and Highways*: Networks of paved or unpaved roads connecting destinations.
- *Railways*: Tracks, stations, and signalling systems for train transport.
- *Airports*: Facilities for aircraft take-off, landing, and passenger handling.
- *Ports and Harbors*: Facilities for loading and unloading ships.
- *Public Transit Systems*: Stations, tracks, and vehicles for public transportation.
- *Bridges and Tunnels*: Structures that facilitate transportation over obstacles.

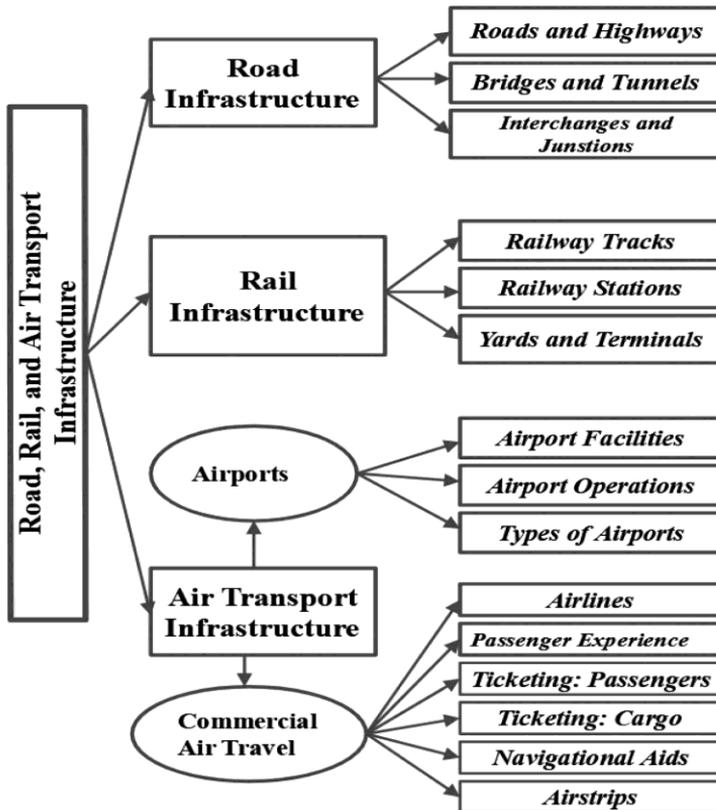


Fig. 5. Road, Rail and Air Transport Infrastructure

Source: Author

Road Infrastructure:

- *Roads and Highways*: Networks of paved or unpaved roads connecting destinations. This includes local roads, arterial roads, expressways, and interstate highways.
- *Bridges and Tunnels*: Structures that facilitate transportation over water bodies, valleys, and other obstacles.
- *Interchanges and Junctions*: Complex Road intersections designed to manage traffic flow efficiently.

Rail Infrastructure:

- **Railway Tracks:** The rail lines upon which trains operate.
- **Railway Stations:** Facilities for passengers to board and disembark from trains.
- **Yards and Terminals:** Areas for assembling, storing, and sorting trains and cargo.

Air Transport Infrastructure

- Airports:
 - **Airport Facilities:** Airports serve as the primary infrastructure for air travel. They include runways, taxiways, terminal buildings, air traffic control towers, hangars, and cargo handling areas.
 - **Airport Operations:** Airports are hubs of activity, managing aircraft arrivals, departures, passenger services, and cargo handling. They often have customs and immigration facilities for international travel.
 - **Types of Airports:** International airports serve global destinations, while regional and local airports cater to domestic and regional flights.
- Commercial Air Travel:
 - **Airlines:** Commercial airlines operate scheduled flights to various destinations, both domestic and international. Major airlines are often part of global airline alliances.
 - **Passenger Experience:** Passengers typically go through check-in, security screening, and boarding procedures before departure. In-flight services and amenities vary depending on the airline and class of travel.
 - **Ticketing:** Passengers purchase tickets for air travel, with fares based on factors such as destination, class, and booking time.
 - **Ticketing:** Cargo facilities at airports handle the loading and unloading of goods onto and from aircraft.
 - **Airstrips:** Smaller facilities for general aviation and regional flights.
 - **Navigational Aids:** Systems like air traffic control and instrument landing systems to ensure safe air travel.

Maritime Infrastructure

Maritime transport infrastructure refers to the physical facilities and systems that enable the movement of goods and passengers by sea, rivers, lakes, and other navigable waterways. Maritime transport is a crucial mode of transportation for international trade and commerce, as it allows for the efficient movement of bulk goods, containerized cargo, and various vessels.

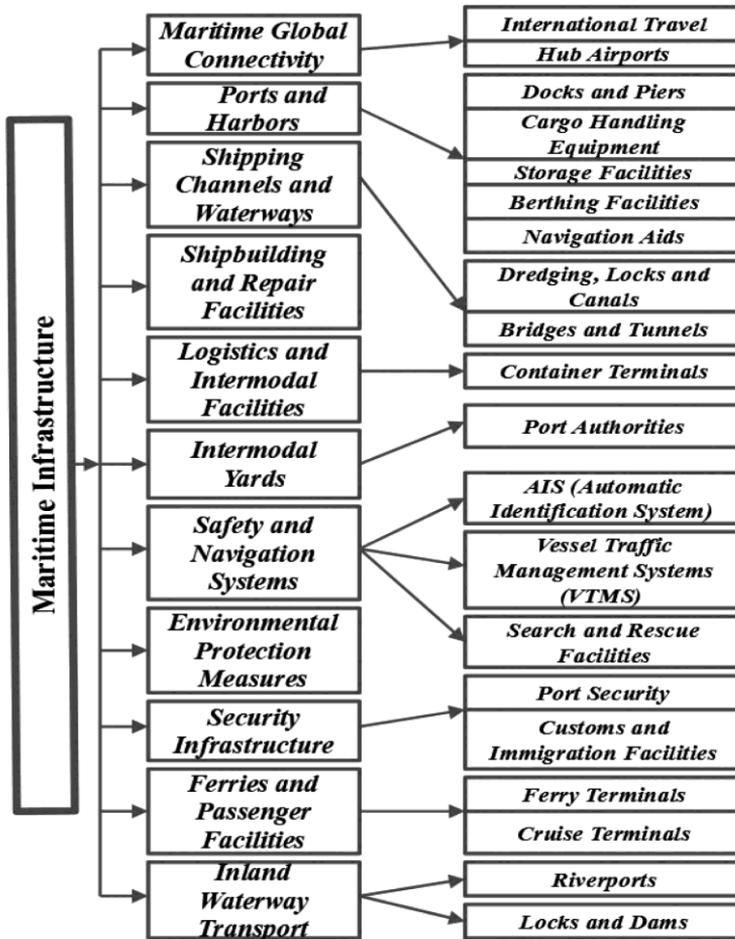


Fig. 6. Maritime Infrastructure

Source: Author. *Logistics and Intermodal Facilities*

Maritime Global Connectivity:

- *International Travel:* transport connects people and goods across the globe, making international travel and trade accessible and efficient.
- *Hub Airports:* Major international airports often serve as hubs where passengers can transfer between flights to reach various destinations.

Ports and Harbors:

- *Docks and Piers:* Structures for ships to berth and load/unload cargo.
- *Cargo Handling Equipment:* Cranes, forklifts, and conveyor systems used to transfer cargo between ships and storage facilities.

- *Storage Facilities:* Warehouses and yards for storing cargo before and after transport.
- *Berthing Facilities:* Facilities for vessels to tie up, including quays, wharves, and berths.
- *Navigation Aids:* Lighthouses, buoys, and navigational beacons to guide ships safely into harbours and along waterways.

Shipping Channels and Waterways:

- *Dredging:* The process of deepening and maintaining shipping channels to ensure that vessels can navigate safely.
- *Locks and Canals:* Infrastructure that allows ships to navigate through bodies of water with varying water levels, such as canals and rivers.
-

Shipbuilding and Repair Facilities:

- *Shipyards:* Facilities for constructing and repairing ships and boats.
- *Dry Docks:* Structures that can be flooded to allow ships to be brought in for maintenance and repairs.

Logistics and Intermodal Facilities

- *Container Terminals:* Specialized facilities for loading and unloading containerized cargo from ships onto trucks and trains.

Intermodal Yards: Locations where cargo containers are transferred between different modes of transportation (ship, truck, train).

- *Port Authorities:* Government or private entities responsible for managing port operations and infrastructure.

Safety and Navigation Systems:

- *AIS (Automatic Identification System):* A system that tracks the positions of vessels and provides collision avoidance information.
- *Vessel Traffic Management Systems (VTMS):* Systems used by port authorities to monitor and manage vessel traffic in harbours and busy waterways.
- *Search and Rescue Facilities:* Operations centres and equipment for responding to maritime emergencies and distress calls.

Environmental Protection Measures:

- *Oil Spill Response Facilities:* Equipment and teams trained to respond to oil spills and other environmental incidents.

- *Marine Pollution Control Systems:* Measures to prevent and neutralize pollution from ships, including waste disposal and ballast water management.

Security Infrastructure:

- *Port Security:* Measures to safeguard ports and vessels from security threats, including access control, surveillance, and security personnel.
- *Customs and Immigration Facilities:* Inspection and clearance facilities for international passengers and cargo.

Ferries and Passenger Facilities:

- *Ferry Terminals:* Infrastructure for loading and unloading passengers and vehicles onto ferries.
- *Cruise Terminals:* Facilities for cruise ships, including passenger terminals, parking, and amenities.

Inland Waterway Transport:

- *Riverports:* Facilities along rivers and inland waterways that serve as hubs for cargo transport and transshipment.
- *Locks and Dams:* Infrastructure that regulates water levels on rivers and canals to aid navigation.

1. Pipeline Infrastructure (Fig. 7):

- *Pipelines:* Networks of pipes used to transport liquids (e.g., oil, gas, water) or solids (e.g., minerals) over long distances.

2. Space Transport Infrastructure:

- *Spaceports:* Facilities for launching spacecraft into orbit or on interplanetary missions.
- *Ground Stations:* Facilities for tracking and communicating with spacecraft in orbit.

3. Public Transit Infrastructure:

- *Stations and Stops:* Facilities where passengers board and exit public transit vehicles (e.g., buses, subways, trams).
- *Tracks and Guideways:* Infrastructure specific to each transit mode (e.g., rail tracks, bus lanes).
- *Depots and Maintenance Facilities:* Locations where transit vehicles are stored, maintained, and serviced.

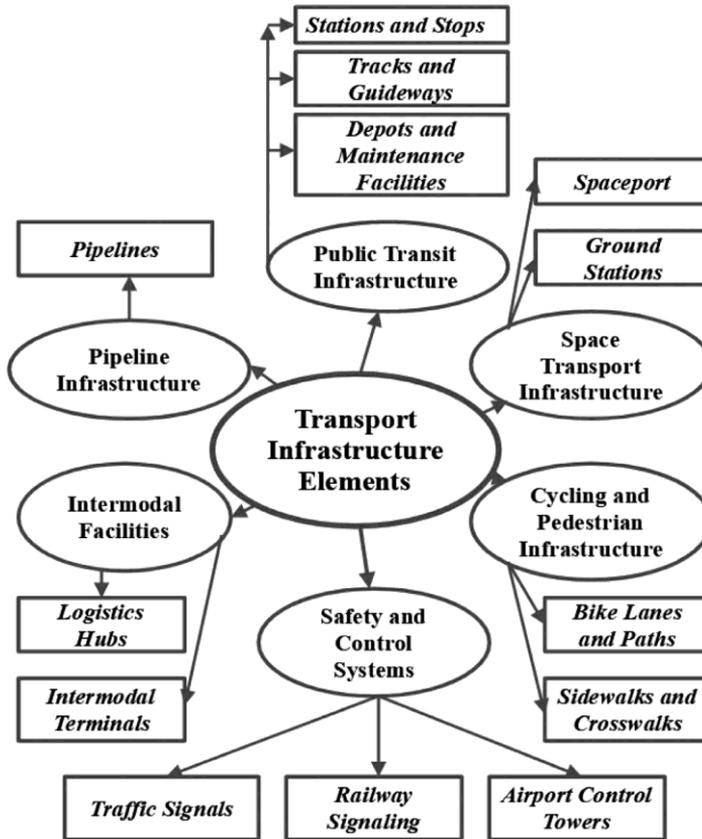


Fig. 7. Elements of the transport infrastructure
Source: Author

4. Cycling and Pedestrian Infrastructure (Fig. 7):
 - ***Bike Lanes and Paths***: Dedicated lanes and routes for cyclists.
 - ***Sidewalks and Crosswalks***: Infrastructure for pedestrians, including walkways, crossings, and pedestrian bridges.
5. Intermodal Facilities:
 - ***Logistics Hubs***: Centres where different modes of transport (e.g., rail, road, air) intersect for efficient cargo transfer.
 - ***Intermodal Terminals***: Facilities that facilitate the transfer of goods between different modes of transportation (e.g., from ships to trucks or trains).
6. Safety and Control Systems:
 - ***Traffic Signals***: Lights and signals at intersections to control vehicle and pedestrian traffic.

- **Railway Signalling:** Systems that control train movement and prevent collisions.
- **Airport Control Towers:** Facilities for air traffic control.

Effective planning, development, and maintenance of transport infrastructure are essential for the smooth operation of transportation systems and the economic development of regions and nations. Infrastructure investments are often made to enhance safety, reduce congestion, improve accessibility, and promote economic growth.

3. TRANSPORTATION PLANNING USING ARTIFICIAL INTELLIGENCE (AI)

Planning for the transport of goods and people includes three main areas:

- **Urban Planning:** Designing cities and regions to optimize transportation efficiency and reduce congestion.
- **Route Planning:** Determining the most efficient paths for vehicles, considering factors like traffic, distance, and safety.
- **Logistics:** Managing the movement of goods through the supply chain, including storage, transportation, and distribution.

Transportation planning using artificial intelligence (AI) involves the application of AI techniques and technologies to optimize and improve various aspects of transportation systems. AI can play a crucial role in addressing the complex challenges faced by transportation planners, such as traffic congestion, emissions reduction, and infrastructure management. Transportation planning is the process of designing, managing, and optimizing transportation systems and networks to move people, goods, and information efficiently and effectively from one location to another. It involves a combination of short-term and long-term strategies to address transportation needs, reduce congestion, improve safety, and promote sustainability. The key aspects of transport planning include the following:

- **Data Collection and Analysis:**
 - Gathering data on travel patterns, traffic flow, and transportation demand.
 - Analysing data to identify trends, congestion points, and areas of improvement.
- **Data Analysis and Decision Support.**
 - AI can process and analyse vast amounts of transportation data, making it easier for planners to identify trends, assess the impact of policy changes, and make informed decisions.

- Needs Assessment:
 - Identifying the transportation needs of a region, city, or community.
 - Evaluating current infrastructure and services to determine deficiencies and challenges.
- Long-Term Planning:
 - Developing long-term transportation plans that typically cover a 20 - 30-year horizon.
 - Setting goals and objectives for the transportation system's future development.
 - Considering population growth, economic trends, and environmental factors.
- Modal Integration:
 - Evaluating and integrating various modes of transport (e.g., road, rail, public transit, cycling) to create a comprehensive and connected transportation network.
 - Promoting intermodal connectivity to facilitate seamless travel between different modes.
- Infrastructure Investment, Maintenance and Management:
 - Identifying priority projects for infrastructure development and expansion.
 - Allocating funds for construction, maintenance, and upgrades of roads, bridges, transit systems, and other transportation facilities.
 - Predictive Maintenance: AI can analyse sensor data from infrastructure components such as bridges and roads to predict maintenance needs and optimize repair schedules.
 - Asset Management: AI can assist in managing and prioritizing maintenance for transportation infrastructure assets.
- Environmental Considerations:
 - Assessing the environmental impact of transportation projects and initiatives.
 - Incorporating sustainability practices, such as reducing emissions and promoting green transportation options.
- Traffic Management and Optimization:
 - Implementing traffic management strategies, such as traffic signal synchronization and intelligent transportation systems (ITS), to optimize traffic flow and reduce congestion.
 - Predictive Traffic Analysis: AI can analyse historical traffic data and real-time information to predict congestion, accidents, and other traffic disruptions, allowing for proactive traffic management.
 - Traffic Signal Control: AI-powered traffic signal systems can adjust signal timings in real-time based on current traffic conditions to reduce congestion and improve traffic flow.
 - Route Planning: AI algorithms can provide real-time route recommendations to drivers, taking into account traffic conditions and optimizing travel times.

- **Safety Improvements:**
 - Identifying high-accident locations and implementing safety measures, such as road design changes and traffic calming measures.
 - Promoting safe practices through public education campaigns.
- **Public Transportation Optimization and Transit Planning:**
 - Expanding and improving public transit services, including bus and rail systems.
 - Enhancing transit accessibility, frequency, and coverage.
 - Demand Prediction: AI can predict public transportation demand based on historical data, enabling better resource allocation and scheduling.
 - Fare and Pricing Optimization: AI can help determine optimal fare structures and pricing strategies to encourage public transportation use and revenue generation.
- **Active Transportation Planning:**
 - Creating infrastructure for pedestrians and cyclists, including sidewalks, bike lanes, and multi-use paths.
 - Promoting walking and cycling as viable transportation options.
- **Land Use and Zoning:**
 - Coordinating transportation planning with land use policies to reduce sprawl and encourage mixed-use developments.
 - Promoting transit-oriented development (TOD) to enhance accessibility and reduce car dependency.
- **Public Engagement:**
 - Engaging with the community, stakeholders, and experts to gather input and feedback on transportation plans and projects.
 - Ensuring that the public's needs and concerns are considered in the decision-making process.
- **Regulatory Compliance:**
 - Complying with transportation regulations and standards at the local, state, and federal levels.
 - Meeting environmental, safety, and accessibility requirements.
- **Transportation Funding:**
 - Identifying and securing funding sources for transportation projects, which can include federal grants, state funding, tolls, taxes, and public-private partnerships.
- **Monitoring and Evaluation:**
 - Continuously assessing the performance of transportation systems and projects.
 - Adjusting and improvements based on data and feedback.

Effective transportation planning is essential for creating sustainable, efficient, and safe transportation systems that support economic development and improve the quality of life for residents. It requires collaboration among government agencies, transportation authorities, urban planners, and the public to address the complex and evolving transportation needs of communities and regions.

CONCLUSION

Understanding and addressing the specific aspects of developing efficient, safe, and sustainable transport systems is crucial for their further development.

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