**The history of roads**routes to moto

The first land routes were **simple paths**. They formed naturally and required no special maintenance. Travelling and moving around was complicated, we had to find a way. As a result, transport was mainly by river and sea. The others transported goods by animals or men on paths composed exclusively of earth.
In the Stone Age, roads did not seem necessary. The trails had been created to overcome obstacles. This is how certain developments appeared: cutting down trees, clearing passages or flattening surfaces.

In ancient times, the main roads linked the main towns. We owe these buildings to the **Romans**. The Roman routes were classified by categories: viae publicae, vicinales and privatea. Some were in the public domain while others were owned by individuals. **It was trade that brought the development of the road world**. The more the Romans progressed in the conquest of the lands, the more the via were multiplied: via Gabina, via Latina or via Salaria. The first paved avenue was named via Appia, the work of Appius Claudius Caecus. It connected Rome to Capua and was extended to Brindisi. Others say we owe it to the Indians. Indeed, they were the first to have a structured and organized urban development plan.

Until the early 2nd century, road construction was always closely linked to strategic needs, especially in trade. At the end of the same century, 372 major routes crossed the Empire, over a length of 77,000 km, 29 of which started in Rome. Some were **paved**, others **clay** or **crushed gravel**. The Romans implemented very advanced techniques. They respected two principles: **adapting to local conditions** and **protecting roads from water infiltration** by already alternating several layers of material and bulging surfaces. It was then that **[the hedgehog foundations](https://www.texum.swiss/en/wikitex/lexique/hedgehog-foundation-in)** were invented. Every 45 to 60 km, inns could be found and every 15 to 18 km relays to change crew or driver. The roads were mainly straight in order to avoid the valleys. At the time, tunnels were already being dug and lit by shafts. Safety standards were also established. Indeed, it is impossible to create roads without inclination. As a result, vehicle loads were limited depending on the type of mule or car.

In the Middle Ages, roads were gradually destroyed. It was in industrial times that the world witnessed the awakening of road construction. Public roads laws were written at that time. **From the 13th century on, roads expanded**. As early as the 14th century, attempts were made to restore the roads established by the Romans. In 1550, the total length of roads in France could be estimated at 25 000 km. However, construction techniques remained rudimentary. For example, in the event of rain, traffic was prohibited because of flooding and water infiltration.

In the 18th century, under Louis XIV, the first autonomous administration was created, currently Ponts et Chaussées. Later, under the reign of Louis XV, **the railways** were invented thanks to a foundation of rubble laid in hedgehogs on so-called curved foundations. During the Revolution, Napoleon Bonaparte ordered that 20 roads be rehabilitated so that one could circulate. Although its interest is exclusively in strategic roads, it is setting up a classification of roads and a numbering system.

In France, around 1764, Pierre Marie Jérôme Trésaguet brought a scientific eye to road construction. Indeed, he made it clear that the main role of the deepest layer was the transfer of road weight and the pressure exerted by loads. Therefore, it is at this point that the function of the external coating becomes clear. What is now called the wearing course is only a smooth surface that protects all the lower layers.

In 1815, in England, a general administrator of roads was appointed: **John Loudon McAdam**. Its innovations have considerably improved road construction techniques. The latter were able to withstand heavy and rapid traffic. **Levelling** and **drying** came into being. The method aims at crushing stones with a hammer so that they have a precise size, shape and weight: 170 grams. To bind this preparation, it mixes sand and water and then agglomerates with the wheels of the vehicles since the road roller does not yet exist. 300 km of roads have been built and have demonstrated the effectiveness of this new technique: less deterioration and almost no infiltration. Also in the 19th century, two very important inventions were born: **the crusher** in 1858 by Eli Whitney Blake in the United States and **the steam cylinder** in 1859 by the French Louis Lempine. At the end of the same century, France and the United Kingdom had the longest and best road networks in the world. As for the United States, it broke records in terms of railways monopolizing commercial transport. The improvement of their lines of communication began in 1891 and that of Canada in 1907.

From the 1900s on, roads only prospered. **Black coating techniques** saw the light of day, then gradually cement, the invention of tyres and the industrialisation of cars.

Then the growing constraints had to be met: vehicles were multiplying and more roads were needed. A new type of communication network then appears: motorways. They still have two separate one-way pavements (each in one direction) with no crossroads. This last point differentiates them from **expressways**. In 1909, a Berlin company established a 10 km test road and the United States in 1914 did the same on 65 km. After the First World War, each country had its own highways and the Italian Puricelli clearly defined its characteristics. After the defeat of 1945, Germany had about 3800 km of motorways.

Today, maintaining the entire road network and improving it are major objectives. This challenge is all the more important with the environmental standards in place and the continuous increase in constraints.

1. What routes did people travel most often in ancient times?
2. How were the first pedestrian roads created and why?
3. Which nation created the roads, that were connecting to the main road?
4. Why [the hedgehog foundations](https://www.texum.swiss/en/wikitex/lexique/hedgehog-foundation-in) were invented?
5. In which century, attempts were made to restore the roads established by the Romans?
6. By whom railways were invented?
7. In which century the crusher was invented?