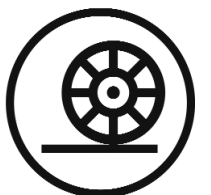


TRANS-  
PORT  
AND  
TRAFFIC

 **technisches**  
museumwien

TRANSPORT AND TRAFFIC



## 6 TRANSPORT AND TRAFFIC

An interactive terminal offering a panorama of the historical, technological and economic development of transport marks the start of "Transport". Means of transport and traffic routes are fundamental to traffic. Ships, lorries, cars, trains and planes are specific means of transport designed for conveyance by water, land and air.

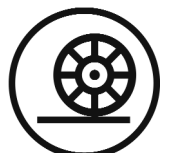
### THE RAILWAYS

The combination of wheels and rails to form rail traffic greatly increased haulage capacity in mines as long ago as the Middle Ages. Yet the real breakthrough for efficient ground transportation was brought about by the introduction of steam power as a power source in early 19th century England, the motherland of railways. It was this instance which paved the way for later industrial societies.

#### 6.1 Exhibit: Passenger carriage "Hannibal"

On September 7, 1824, emperor Francis I granted Franz Anton Ritter von Gerstner the privilege to build an "iron and wood railway" from Mauthausen (and later from Linz) to Budweis. This marked the beginning of the railway era and the industrial age in the Habsburg monarchy and was to leave a major impact on the 19th century as a whole. The horse-drawn railway from Linz to Budweis went into service on August 1, 1832 as the first railway for public transport in continental Europe. Originally it was not designed for passenger transportation but in the summer of 1833 people from Linz began to venture forth into the nearby hills of the Mühlviertel and St. Magdalena soon became a popular destination for excursions. This induced the "k.k. privilegierte erste Eisenbahn-Gesellschaft" (imperial-royal privileged first railway company) to make passenger transportation a regular feature on their schedule. Soon much of the enterprise was engaged in transporting people, especially from 1836 onwards, when the line was extended to Gmunden.

To begin with the passenger cars of these first railways closely resembled road carriages which until then had been the only passenger vehicles available. Typical railway coaches developed only gradually. The early railway coaches were frequently named after topographical terms or terms related to antiquity.



“Hannibal”, a 1st (and then 2nd) class passenger car on the horse-drawn railway from Linz to Budejovice was built in 1841 and used on the northern line until 1872. It is composed of four interior and exterior seats each, the one for the coachman being equipped with lateral brake rods. To minimize the risk of derailing the drawbar is not linked to the front wheel set which was then common practice with road carriages. The car also has an unusual steering mechanism which allows the pivoted axles to be brought into a radial position for improved cornering motion. The car, the only one of its kind, is placed on original flat-headed rails.

Weight: approx. 2,000 kg

Gauge: 1,106 mm (3 \_ Viennese feet)

The Centre Hall offers a first encounter with the transport section. Several large exhibits related to transport were restored here in 2002 and are now available for viewing.

## **6.2 Exhibit: The “Gmunden” steam locomotive of the “k.k. privilegierte erste Eisenbahn-Gesellschaft”**

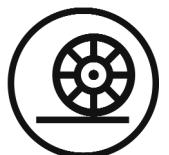
The horse-drawn railway from Linz to Budweis, the first railway for public transport in continental Europe, introduced steam engines to its southern line between Linz and Gmunden in 1855.

For this purpose the railway company acquired 10 passenger train locomotives, among them the “Gmunden” engine run as train no. 4. It was in operation until 1884 and then entrusted to the custody of the museum.

## **6.3 Exhibit: Summer car B 10**

As steam operation was introduced to the horse-drawn railway from Linz to Budweis known as “k.k. privilegierte erste Eisenbahn-Gesellschaft” since 1825, new cars were acquired, among them car B10 (B = 2nd class car, 10 = serial number) designed for summer usw with glassless windows.

The car is equipped with three compartments with eight leather-upholstered seats each. To brake the axle there are wooden brake pads which are activated by a foot pedal.



#### 6.4 Exhibit: Imperial saloon car Hz 0011 for Empress Elisabeth

In 1873 Empress Elisabeth was presented a train formation consisting of two saloon cars by the Austrian railway company for her personal use. As requested by the Empress the cars were kept inconspicuous on the outside while the interior was decorated with discreet elegance.

Saloon car Hz 0010 which no longer exists was designed for shorter trips and for longer journeys a sleeping car was attached. Following the tragic death of the Empress, sleeping car Hz 0011 was given to the Austrian Railway Museum which today forms part of the Technisches Museum Wien.

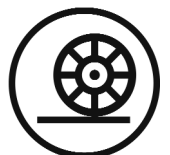
## SHIPPING

Boats are the oldest types of vehicles built by man. They are more than a means of transport and since time immemorial have been used for fishing and trading, for voyages of discovery, as well as for passenger transportation. At the museum buoys mark the entrance to the exhibition on “shipping” while at sea they are navigation marks.

Paddles and oars are probably the earliest known means of propulsion. The first steam engines installed on ships were used to power paddle-wheels. Josef Ressel (1793-1857), an Austrian forestry official, used the Archimedean screw to develop a new kind of boat propulsion. He had trained and graduated from the forestry academy in Maria Brunn near Vienna and in the course of his career was stationed in Istria, Venice and Trieste where he designed mills, a steam vehicle, stage machinery, a reforestation project for the karst and much more.

#### 6.5 Exhibit: Experimental Ship “Civetta” (little owl)

Ressel was able to interest Ottavio Fontana, a merchant from Trieste, in building a experimental ship that would cover the distance between Trieste and Venice. Following Ressel’s instructions an Archimedean screw was installed at the stern between the stern post and the rudder – believed to be the most effective location on the ship. Unfortunately its steam engine failed after only a few meters because of a badly soldered pipe which burst. Urged on by the paddle-steamer company operating between Trieste and Venice local police prohibited a repeat trial.



## 6.6 Exhibit: The Austrian Lloyd

Founded in 1832 by insurance companies in Trieste Austrian Lloyd began steamship services in 1837. The paddle steamer “Conte Stürmer” exhibited in the museum belonged to their first vessels. Following the opening of the Suez Canal, original destinations to the Mediterranean and the Adriatic in particular were soon complemented by trips to India and faraway China. By 1886 the fleet had reached its peak with 86 Lloyd ships, most of which at that point had been adapted as screw ships. “Gablonz”, a twin-screw ship built in 1912, represents one of the last reconstructions of the time.

## 6.7 Exhibit: “Gablonz” express steam ship

Built for Austrian Lloyd in 1912 by the shipyard of S. Rocco in Trieste the twin-screw passenger steamship (driving power: 7,500 hp in total, 8,448 BRT), as of 1913 was used for destinations to the far east (Trieste – Bombay). On February 15, 1941, “Gablonz” was engaged in war actions and consequently lost. “Marienbad”, a sister ship of the same size, was used between 1913 and 1916. “Gablonz” and “Marienbad” were the fleet’s largest ships.

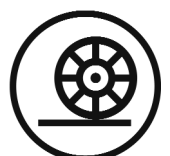
# AVIATION

One of man’s age-long dreams has been to conquer the air. Balloons and airships were the first attempts at aviation. Based on the flight of birds and the construction of suitable engines aeroplanes were eventually built without which modern transport would be unthinkable.

Otto Lilienthal was quite exceptional among flight pioneers. One of the few remaining original apparatuses owned by the flight technician who died in an accident in 1896 is now in the possession of this museum.

Theoreticians like Friedrich Lössl, Georg Wellner or Richard Knoller, physicists Ernst Mach and Christian Doppler, as well as aviation pioneers Wilhelm Kress and Igo Etrich all had a marked influence on early aviation history in Austria.

Wilhelm Kress was born the son of German parents in St. Petersburg in 1836. At the age of thirty he began to concern himself with aviation matters. The tools he used for his tests would seem like children’s toys today. One of his ideas was to equip a kite with a screw activated by an engine. He then



went on to do tests with clockworks which turned out to be too heavy. In 1873 he moved to Vienna where he began to experiment with models driven by “rubber engines”.

The “Monoplan” was the first self-starting and free-flying aircraft with solid wings that was heavier than air. Between 1898 and 1900 attempts were undertaken to build a heavier-than-air craft.

### **6.8 Exhibit: The Kress “Monoplan”**

Experiments using two screw propellers with rubber cord propulsion led to the development of the first free-starting and free-flying aircraft with solid wings heavier-than-air.

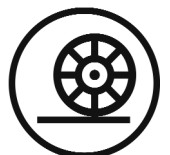
### **6.9 Exhibit: Kress “Drachenflieger I” (triplane winged aircraft)**

The “Drachenflieger” was manned by one pilot and driven by a 1 x 22 kW (30 PS) Daimler engine with two contra-rotating airscrews. The original built with Mannesmann pipes sank on October 3, 1901 following a series of tests on the Wienerwald storage lake where the floats filled up with water.

In Austria, Ignaz and Igo Etrich began experimenting at the same time as the Wright brothers did internationally. Their dream of easy flying was to materialise as the “Etrich” dove. The Wrights’ first fully functioning flying machine and copies of this double Decker with rectangular wings were difficult to handle. Igo Etrich, however, looked out for objects in nature that flew easily and used his findings to design a wing shape that would provide inherent stability to planes. The shape of the wings, in fact, was a copy of the flying seeds of the “zania macrocarpa” native to Java.

### **6.10 Exhibit: The Etrich-II “Taube” (dove)**

Etrich II, the first Taube, was built in the winter of 1909/10 based on previous experiences made with Etrich-I and the converted, motorized glider built in 1907. Karl Illner, a colleague of Etrich’s, took this opportunity to become Austria’s third qualified pilot on April 25, 1910. He later won numerous flying competitions with the new plane. On May 17, 1910 he completed the first cross-country flight from Wiener Neustadt to Vienna and back. The “Tauben” were produced in series at the Lohner company in Vienna, with the k.u.k. Luftfahrtruppe in Fischamend, with Rumpler in Berlin and with Etrich in Oberaltstadt. Numerous copies were later built in Germany.



## ROAD TRANSPORT

### THE BICYCLES

Man's means of propulsion were revolutionised in the early 19th century by one inventor Karl Drais, a forest superintendent from Baden in Germany. He designed a running machine for which he was granted a patent in 1817. Such vehicles were initially intended as toys and fitness equipment for the rich and were soon forgotten. The early running machine did not as yet have the pedal drive characteristic of today's bicycles. It was superseded by the French Michaux Velocipede in the mid-sixties of the 19th century and eventually by the ordinary or high bicycle (approx. 1875). The latter was capable of covering long distances with a single turn of the crank and without mechanic transmission. With its elevated seat it required a fair amount of acrobatic skills and thus was soon replaced by the "safety bicycle". The low bicycle created in about 1890 essentially looked like the bicycles we know today. Final major innovations were pneumatic tires and gears added around 1900. The Steyr "Waffenrad" bicycles (approx. 1900) were widely appreciated for their robustness and were often handed down through several generations. They were produced until recently without any significant adaptations.

#### 6.11 Exhibit: Running Machine / Draisine

An early form of the bicycle was the draisine a machine propelled by the rider pushing against the ground. One manufactured by the Viennese firm of Anton Burg (c. 1820) is on display. Its appearance is quite different from the wheels produced by Drais yet from the technical point of view it is very much the same. It has both the arm rests and stomach pad characteristic of the "draisines". The use of different-sized wheels, however, is quite untypical, as is the actual design of the wheels. The spokes have a futuristic touch to them, a fashion that, with today's high-tech material, has become quite popular again. Anton Burg ran his own bicycle school in the backyard of his agricultural machine manufacture.

#### 6.12 Exhibit: The Steyr Waffenrad Model 97

The Steyr works were looking for a second line to complement their arms production. They found that bicycles were built by methods quite similar to those used for the production of arms and thus decided to engage in the bicycle business. They banked on the well-proven quality of Steyr arms and called their bicycles "Waffenräder" (arms bicycles) to boost sales. The disc shaped chain wheel provided a welcome advertising surface. Technically, the Steyr Waffenrad has all the makings of a modern bicycle, including gears, free-wheel, brakes on both wheels, luggage carrier and dynamo. It has, in fact, become a prototype of popular everyday bicycles.



## THE MOTORCYCLES

By about 1900, the motorcycle was out of its experimenting stage. Series productions such as the Laurin & Klement or the Puch with its sidecar were now on the market. They were the first efficient motorized leisure time vehicles. After World War I, British motorcycle industry took a leading role on the market. In Austria due to a lack of domestic production most motorcycles in the midrange were British imports. Motorcycles in the top range, usually with sidecars, were predominantly of American origin, most specifically Indians or Harley-Davidsons. After the World War II, motorcycles were seen as an affordable alternative to automobiles. Once the “economic miracle” allowed most people to acquire their own car and thus a “roof over their heads”, the general interest in motorcycles soon waned. Sports fanatics were the only ones still enthusiastic. By 1960, motorcycles were almost impossible to sell. It was not until the 1970ies that they came into their own again: as motorized vehicles for leisure time, fun and enjoyment, which is what they were intended for.

### 6.13 Exhibit: Puch 5HP with sidecar

In 1903, Puch, a company well established in the bicycle business, started up its own motorcycle branch. The large two-cylinder models produced from 1905 on were primarily used as racing models or touring vehicles with sidecars. The exhibited model is probably the last of its kind which still has its original paintwork.

The two-cylinder engine of approx. 730 cm<sup>3</sup> is equipped with a magneto-electric touch-spark ignition, a Longuemare carburettor and chain transmission. The two-speed gearbox and clutch are installed at the rear wheel. With a light sidecar the motorcycle could reach a maximum speed of 50km/h.

### 6.14 Exhibit: Puch 250 TF with sidecar

The 250 TF was Puch's first new construction after World War II. The least powerful of motorcycles designed for use with sidecars was considered the cheapest means of transport for small families before the “post-war boom”. With its powerful double-piston engine and light sidecar the motorcycle proved ideal for Austria's mountain roads.

Reliability, long life and low maintenance were the strong sides of the motorcycle of which almost 60,000 were produced. Most of them were sold on the domestic market. The new small automobiles which all provided a “roof over people's heads”, i.e. the Lloyd, the Gogomobil or the Puch car, put an end to motorcycles for everyday use. Fuel consumption of the Puch double-piston engine was between 4.5 and 7.5 litres per 100 km, depending on how it was driven.



### 6.15 Exhibit: Gräf-Front

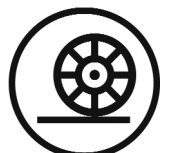
Well before the turn of the century the "Gebrüder Gräf" and Mr. Pösendeiner developed a revolutionary concept that was to anticipate essential characteristics of today's "front-wheel drives": the entire drive unit was to be arranged above the front axle. A cone clutch was to transmit power from the 400 cm<sup>3</sup> 3.5 HP DeDion one-cylinder engine to the two-speed gearbox (inclusive of reverse gear) and from there via the differential and the cardan joints to the front wheels. The advantages of the front-wheel drive were far less obvious in those days than they are today. For economy of space all small cars and most larger ones too are now built by this method. Yet the time was not ripe for series production then, as universal joints would not have stood the test in practice. Only two prototypes were built. The model exhibited here is considered one of the most interesting in the road vehicle section from the point of view of technical history.

### 6.16 Exhibit: Steyr 220

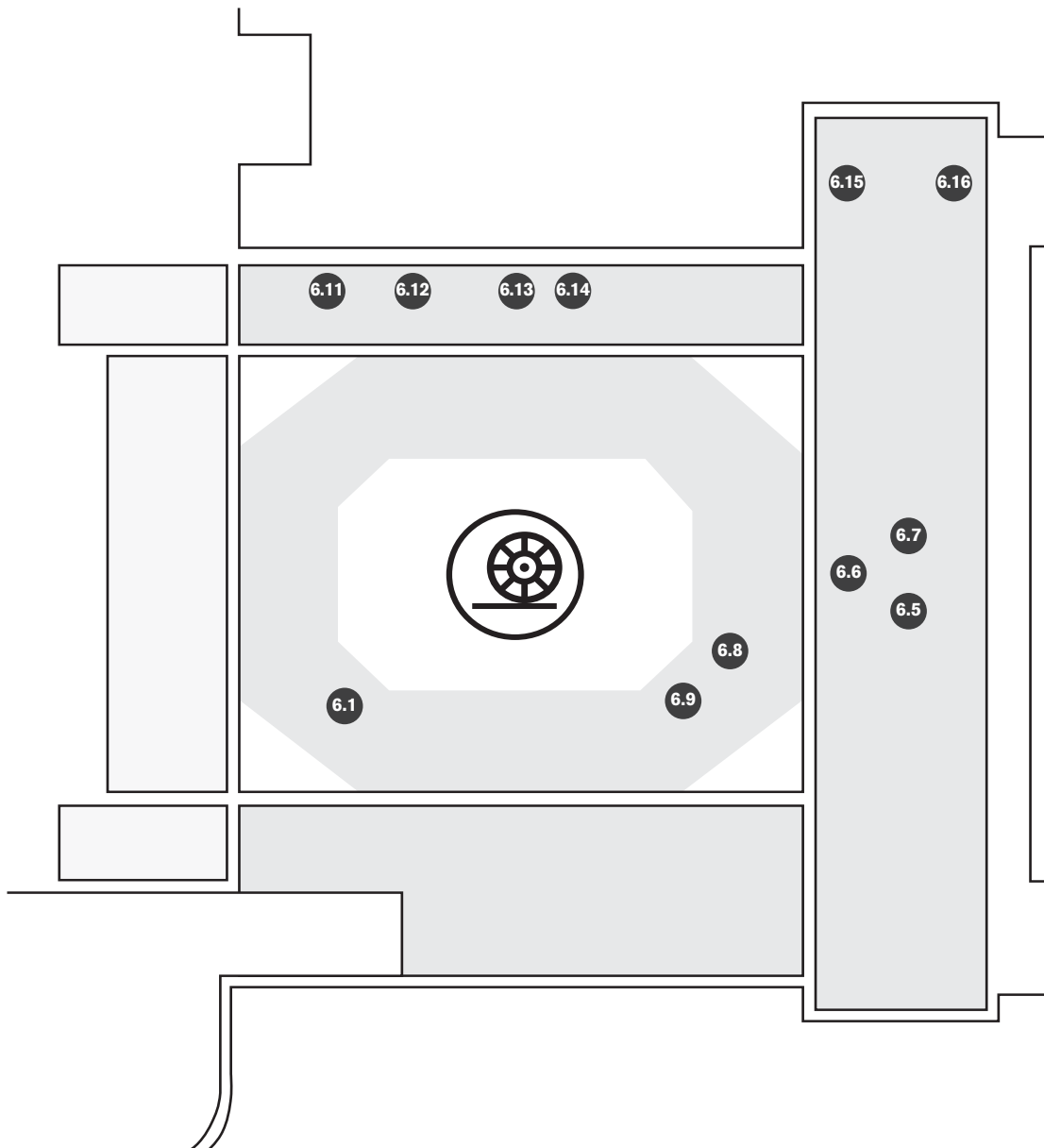
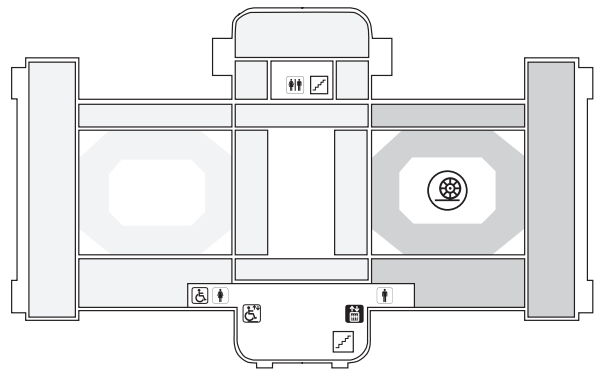
Advertisements of the time praised the car as "the epitome of performance and elegance". It was the dream car of its era and marked the zenith of years of development which had begun in 1930. Engine, gears, chassis and body were of the highest international level in every respect. Performance and comfort were only outdone 20 years later by other brands' top models.

Fuel consumption of between 12 and 15 litres per 100km for a 55 HP automobile, of course, is hardly acceptable by today's standards.

The political and economic situation at the time did nothing to induce the car's success abroad. Between 1937 and 1941, as total of 5.900 cars were built.



- 6.2
- 6.3 Objects located in the middle part of E2
- 6.4
- 6.10



Objectarrangement  
Transport and Traffic  
E 4