GMUNDEN - SALT, SPA & STADREGIOTRAM

by Mike Bent

Tram 8 pauses at the Tennisplatz stop in Gmunden.
Author

Introduction

Gmunden lies on the northern shore of the Traunsee, to the east of the Salzkammergut district and Salzburg, in the northern foothills of the Austrian Alps. In addition to being near the termini of the both world's oldest industrial pipeline and Europe's second oldest public railway, the town, since 1862 a 'Kurstadt' (spa resort), has a 145 year old operational paddle steamer, and one of the steepest, shortest urban tramways in Europe, now being expanded into a modern Stadt RegioTram interurban network.

White Alpine Gold

Exploitation of the rock salt deposits in and around Salzburg and the Salzkammergut dates back possibly as far as the 12th century BC at the Hallstatt mine, claimed to be the oldest in the world. It is reckoned that in the 8th century BC one man could mine around 2,000 kg of rock annually, with a salt content of between 40 and 70%, sufficient for the yearly consumption of around 1,000 families.

During the Roman era the economy of the Austrian salt mines suffered through the processing of cheaper sea salt. This technology of evaporating brine eventually brought about a mining revival in the Salzburg district. Underground streams with a high brine content were harnessed and wells were sunk, the saline waters being fed into salt pans, the first of which is believed to have been in existence by 1210 in Mühlpach (Hallein), to the south of Salzburg.

The Archbishop of Salzburg between 1587 and 1612, Wolf Dietrich von Raitenau, encouraged the use of 'solution mining' techniques to augment the supply of brine, water being injected into the salt-bearing rock through adits, resulting in the salt being dissolved, and the brine being channelled into salt pans for evaporation. The end result was the production of massive quantities of salt. The consequent revival of the salt mining industry and huge sales of the end product resulted in Salzburg becoming a powerful trading community, the wealth being displayed in the abundance of Baroque architecture which has earned the city the status of a UNESCO World Heritage Site.

Transporting Salt: Waterways, Flumes, Canals and Pipelines

The main markets for the salt were in Bohemia and Prussia. From the mines at Berchtesgaden and Hallein it was transported by boat down the Salzach river to the Inn, and thence to the Donau at Passau. It then had to be moved on horse-drawn carts over the Šumava hills to Budweis (České Budějovice), whence barges were used for the remainder of the journey down the Vltava

(Moldau) to Praha, and onwards via the Labe/Elbe into Prussia. In 1542 annual production of 22,000 tonnes was recorded, and means of making the transport system more efficient were even then being investigated.

The idea of building a canal between the Donau and Vltava had been under consideration since the reign of the Holy Roman Emperor Charles IV in the mid-14th century, but it was not until the late 18th century that suitable engineering technology was available for its construction. The result, designed by the engineer Josef Rosenauer, was not exactly a canal, but a long, generously-dimensioned log flume, to facilitate the floating of timber from the forests in the Šumava hills to the Vltava. Construction started in 1789, and the 39.9 km flume, known locally as the Schwarzenberský kanál, was used for the first time in 1791. Extensions during the early 1820s resulted in the flume being 89.7 km in length, with sections linking both the Donau and the Vltava. While it was ideal for timber transport, the flume obviously could not be used for the transport of barrelled salt. Parts of it remained in use until 1962, and it has since been designated a cultural monument of technical importance.

In 1807 the mathematics professor František Josef Gerstner of Praha University was appointed as overseer of the construction of a proper canal, navigable by barges, linking the Donau and Vltava. He soon realised that this project would be extremely expensive, on account of the civil engineering involved in taking the waterway over the high watershed between these rivers. He instead proposed a railway with horse traction between Budweis and Mauthausen, and in 1820 charged his son, František Antonín Gerstner, with the realisation of this project.

Salt bound for Bohemia and Prussia from the mines on the Salzberg, at Hallstatt on the western shore of the Hallstätter See, followed a different route to that mined in the Salzburg district. 'Hall', commonly found in some Austrian and German place names, is the Celtic word for 'salt'. At Hallstatt the Pfannhaus (salt pan complex) was increased in area from 32 m^2 in the early 14th century to 361 m^2 by 1697, in response to production increases. A good deal of wood was consumed in keeping the pans on the boil, to the extent that by the end of the 17th century the local stands of timber had been seriously thinned.

The salt obtained through evaporation was barrelled, and loaded onto flat-bottomed, shallow-draft boats known as Zillen. Having crossed Hallstätter See to its northern end, the Zillen entered the upper Traun, negotiating various rapids on their descent past Bad Ischl to Ebensee, at the southern end of the Traunsee. The Zillen then crossed to the northern end of the latter lake, rejoining the Traun for the descent via Lambach and Wels to join the Donau near Ebelsberg to the southeast of Linz, adjacent to the the quay facilities at Zizlau and the present-day voestalpine steelworks. Improvements to the navigability of the Traun in 1573 enabled the use of Zillen up to 30 m long and able to carry payloads of up to 7.2 tonnes. The journey was nevertheless risky, especially as far as Ebensee, 37km from Hallstatt and 374 m lower.

A replica Zillen in action.

Author

In the late 1500s the shortage of timber at Hallstatt prompted a search for a more suitable location for the Pfannhaus. There was plentiful woodland on the shores of the Traunsee, but how could the brine – of far greater volume than the salt derived from evaporation – be transported there economically and safely? Brine flows under gravity. In the 1590s Emperor Rudolph II authorised the construction of a 34 km pipeline, the first industrial pipeline in the world, to eliminate the difficult part of the river journey between Hallstatt and Ebensee. Construction of the pipeline, under the supervision of the local Waldmeister, Hans Kalß, started in 1604, and was completed in 1607. The project required the use 13,000 coniferous tree trunks, cut into 4.5 m lengths. A particular civil engineering challenge was the Gosauzwang ravine, where originally on one side the pipeline abruptly descended through 23.4 m, then on the far side rose steeply, the brine surmounting this ascent under pressure. The high pressure here resulted in frequent breakages of the wooden tubes, and leakage where they were connected, and in 1757 the pipeline was carried over the ravine on a viaduct. Such was the quantity of brine moved that in 1752/2 a second pipeline had to be laid, and a third was commissioned in 1756.

The viaduct over the Gosauzwang ravine.

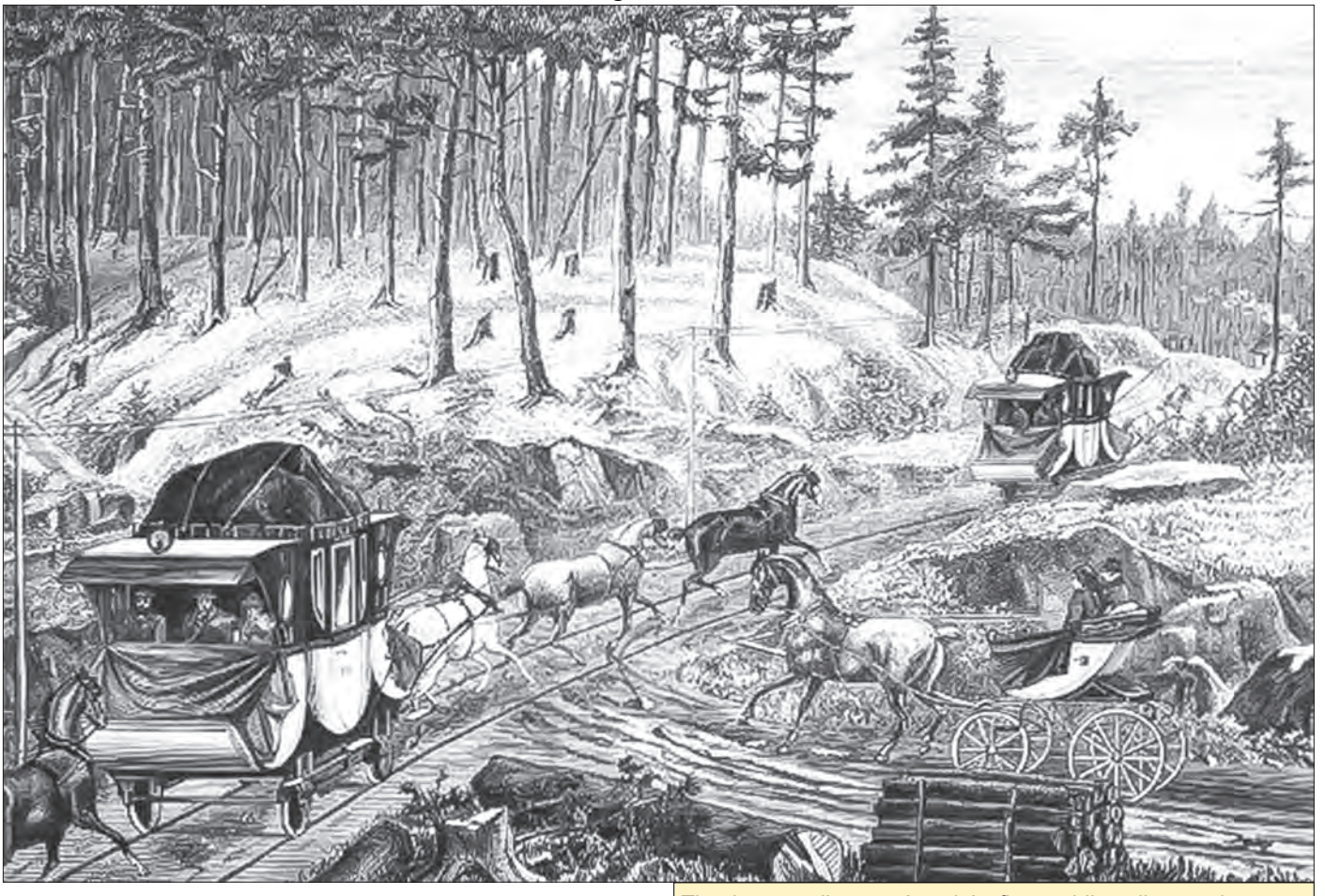
Author

At Ebensee a new Pfannhaus was built between 1604 and 1607, and the first brine was evaporated there on 8 February 1607, some specialists from Bad Aussee having been brought in to supervise operations. These specialists also brought with them the traditions associated with 'Fasching' - the pre-Lenten carnival. This hit the local headlines in 1733, when the workers revolted against a decision by the Salinenverwaltung (management) to make them work on the afternoon of Shrove Tuesday.

The Pfannhaus, Ebensee church tower and five houses, were destroyed in a major fire on 9 July 1835. Reconstruction took place over the following year, and in 1883 the Solvay brothers Alfred and Ernest established an adjacent caustic soda works there, acquiring the Pfannhaus from the Österreichischen Salinen AG in 1928.

The '660 HP Railway'

On 7 September 1824 František Antonín Gerstner's company, the Ersten Eisenbahn-Gesellschaft (EEG - First Railway Company) was granted a 50-year concession for the construction and operation of a railway between Budweis and Malthausen. Work on this 1,106 mm gauge line started on 28 July 1825 near Netrobitz (today's Netřebice). Although it was the first public railway in Austria, it was in fact the second public railway (as opposed to mineral lines) to be built in continental Europe. The first was the Compagnie du chemin de fer de Saint-Étienne à La Loire's 18 km line from Saint-Étienne to Andrézieux, inaugurated on 30 June 1827. The first trains ran between Budweis and Trojern (now



The horse railway - Austria's first public railway - between Budweis and Linz.

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Trojany), 54 km, in September 1827. The complete 128.8 km line between Budweis and Linz (the latter city eventually preferred to Mauthausen) was inaugurated on 1 August 1832, in the presence of Emperor Franz I and his wife, Karolina Augusta.

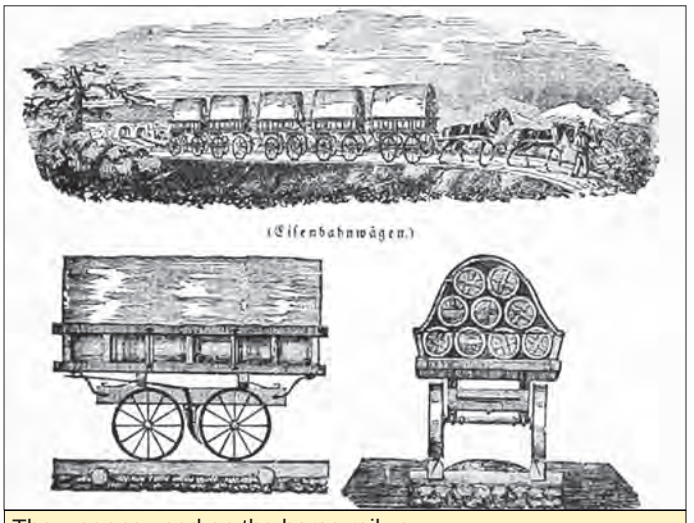
The railway's northern terminus was situated adjacent to the warehouses belonging to the shipbuilder A Lanna in Budweis, on the banks of the Vltava, at an altitude of 385.5 m. It then passed close to Budweis Bahnhof (1.7 km), and started to ascend the north-facing slopes of the Šumava hills, with stations and passing loops at Bienedorf, Steinkirchen, Plawnitz, Nurdahof and Holkau (18.235 km). The ascent continued through Neu Wirtshaus to Angern (37.016 km) then via Suchental,Fladenwald and Zartlesdorf to Pramhöf (62.043 km, altitude 712.2 m). The summit of the line, at 713.4 m, was just before Kerschbaum (64.568 km). As far as here the ruling gradient was 5.07‰, with some stretches as steep as 10‰. However the descent into the Donau valley was considerably steeper, varying between 7.84‰ and 12.51‰. The line passed through Baumgartner to reach Lest (87.129 km, altitude 536.4 m), and then was routed via Bürstenbach, Hatmannsdorf, Oberndorf (108.549 km, altitude 341.2 m, Schweinberg and Treffling to St. Magdalena, Gräfenberg, Wies, Urfahr (127.801 km) and the main tollhouse in Linz, on the left bank of the Donau, which served for the time being as the southern terminus (128.848 km, altitude 254.1 m). The principal stations were on average 21 km apart, and were equipped with stables, since they served as relay stages for teams of horses.

At this time the amount of salt being produced at Ebensee was rising steadily. Between there and Linz there was still no alternative to transporting the salt using Zillen, and the cost of keeping the lower reaches of the Traun between Gmunden and Zizlau navigable was so great, with work required every year, that in the early 19th century a parallel canal was considered. This was also regarded as extremely costly, so in 1814 the various salt authorities (Salinenbehörde) suggested construction of a railway with horse traction. It was not until 1829 that Franz Zola, who had been one of František Antonín Gerstner's engineers (and was the father of the writer Émile Zola) proposed to extend the EEG from Linz to Gmunden at his own expense, provided he could find financial backers. Support was not forthcoming, so Zola left Austria to settle in southern France. In 1833 the concession for the Linz to Gmunden extension was obtained by the Geymüller, Rothschild and Stametz banking houses, which had earlier financed construction of the EEG between Budweis and Linz.

Construction of this new railway started early in 1834, and advanced rapidly, with the result that the 23.240 km between Linz and Maxlhaid were ready for use on 1 June that year. A 2.354 km branch, accessed by a triangular junction, served the quays at Zizlau (22.123 km, altitude 249.6 m). In 1835 tracks were laid across the wooden bridge spanning the Donau to the main tollbooth in Linz to connect up with the line from Budweis. Maxlhaid to Wels was inaugurated on 1 April 1835, and Wels to Lambach (19.579 km from Maxlhaid) on 1 August that year. On 1 May 1836 the penultimate stretch, from Lambach to Gmunden-Engelhof (21.336 km, altitude 474.1 m) and Gmunden-Traundorf was inaugurated. It was not until 1842 that a short extension was completed through the urban area from Traundorf across the Traun to Gmunden-Rathausplatz (2.514 km from Engelhof, altitude 423.7 m). The total distance from Linz to Gmunden Rathausplatz was thus 67.932 km, the maximum gradient encountered being just 3.36‰ as far as Engelhof, with a short stretch at 20.04‰ thence to Rathausplatz.

In 1834 the first excursions were offered for passengers, to the spring market at Urfahr. 2,379 passengers were carried to and from this event and 46 more, these on the Linz to Gmunden extension, during the whole year. Encouraged, he EEG requested permission for the regular transport of passengers, this being granted on 10 May 1836, although 47,405 had already been carried in 1835. The initial passenger service involved 'trains'

leaving Linz and Budweis at 05.00, and crossing at around noon at the summit station of Kerschbaum, where an hour was allowed for lunch in the station's dining room. Arrivals in Budweis and Linz were at 19.00. In 1836 3,948 passengers were carried on the Linz to Budweis service, in 1840 10,784, in 1850 18,080 and in 1857, the peak year, 20,319.



The wagons used on the horse railway.
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Naturally, the passenger 'trains', being lighter than the freights, were faster, the horses reaching speeds of between 10 and 12 km/h, and even 15 km/h on downhill stretches of line. Signalling appears to have been non-existent, though train graphs were prepared. If an oncoming freight convoy met a passenger service between passing loops, the passengers simply had to lift their lightweight carriages off the tracks to let it pass. Matters were made easier by the installation of a telegraph system linking the stations, but this did not take place until the late 1850s.

By 1848 there was a comparatively intensive passenger service between Linz, Lambach and Gmunden-Traundorf. Departures from Linz-Basdargarten were at 05.00 (for Lambach, arriving 09.00), 06.00 (for Gmunden, arriving 12.30), 13.00 (for Gmunden, arriving 19.15) and 17.00 (for Lambach, arriving 21.00). Departures from Lambach were at 04.30 and 07.45, arriving Linz at 08.00 and 11.15, and from Gmunden-Traundorf at 10.00 and 14,45, arriving Linz at 16.15 and 20.30. Here patronage was considerably heavier than on the Linz to Budweis line, rising from 46 in 1834 to 43,158 the following year, 113,672 in 1840, 158,286 in 1850 and peaking at 170,877 in 1852, then declining to 139,017 in 1859.

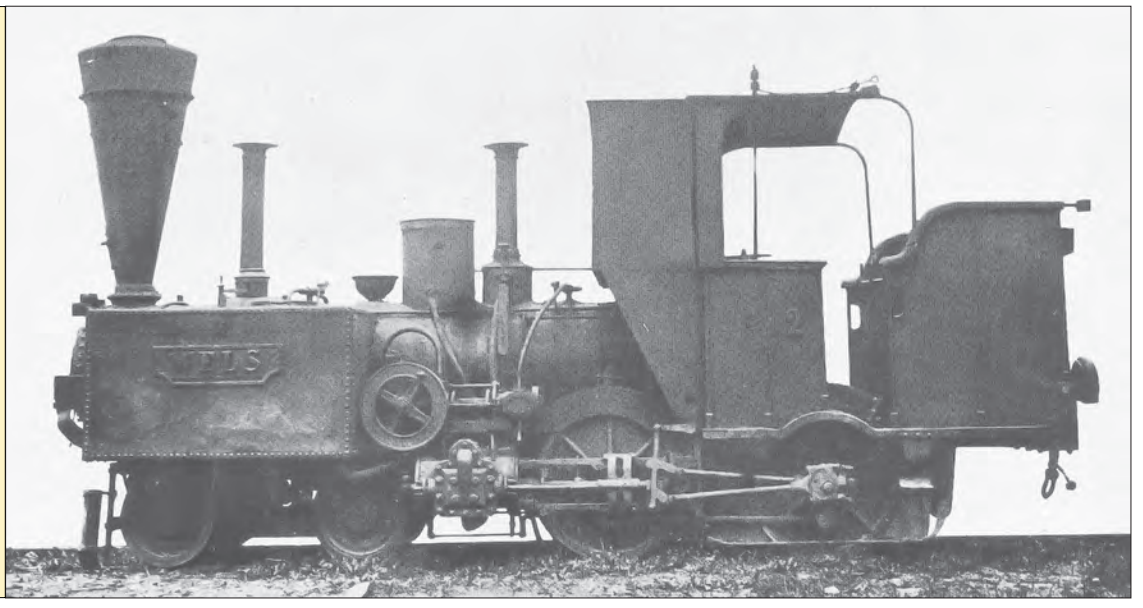
By 1857 the EEG had 96 carriages, of three classes. The construction of the first and second class vehicles was similar to that of road stage coaches of the period, while the third class vehicles were essentially covered low-sided wagons fitted with seats.

A fleet of 1,092 wagons was in use in the late 1850s. These were two-axle, low-sided vehicles, with a very short wheelbase, capable of carrying up to 40 barrels of salt, each weighing 56 kg. Typical payloads varied between 2.5 and 3.5 tonnes. Trains between Gmunden and Linz consisted of rakes of up to six wagons, and usually ran in convoys of six. Journey time between Gmunden and Linz was around one and a half days, while Linz to Gmunden took four days.

The transport of salt accounted for 52% of the railway's receipts, but freight traffic only developed slowly, with a modest 22,702 tonnes being carried in 1834. In 1843 350,000 tones of salt and 325,000 tonnes of other commodities were carried, while coal from Bohemia provided southbound loadings, as demand for this fuel in the Linz district grew. It was reckoned that moving freight by the railway was around 60% cheaper than by the use of horse and cart on roads. The horse-drawn freights managed an average of 4 km/h and covered around 40 km per day. The retail value of produce fell substantially, on account of the lower transport cost.

Motive power in 1857 consisted of a fleet of 660 horses, mostly of the strong Noriker or Pinzgauer mountain breeds. Teams of horses were changed roughly every 30 km. Their tasks were probably slightly easier than those of horses used on road freight transport at that time, given the lower rolling resistance of wheels on rails. The EEG also experimented with the use of oxen, considered cheaper since they were fuelled with hay, rather than oats and corn. They had much a slower operating speed, tended to suffer more failures through exhaustion, and also took fright more easily. The railway was laid using longitudinal sleepers on which the rails were mounted. This had one great advantage over the use of conventional sleepers, since a firm and even space existed between the rails for the horses to trot on, without the risk of stumbling. Later, transverse sleepers were also used on curves.

The EEG soon took advantage of the development of steam locomotives, for use between Linz and Gmunden. The types of machine available at that time were still too underpowered to be of effective use on the steeply graded line over the Šumava hills, First, ten 4-4-0s were acquired from Johann Zeh's Wiener Neustädter Lokomotivfabrik, carrying the numbers 1 to 10 and the names LINZ, WELS, LAMBACH, GMUNDEN, ROITHAM, TRAUNFALL, ENGELHOF, LAAKIRCHEN, ISCHL and EBENSEE respectively. Deliveries took place in 1854/5. The



No. 2 WELS, one of the ten 4-4-0s acquired for the conversion of the EEG to steam power.
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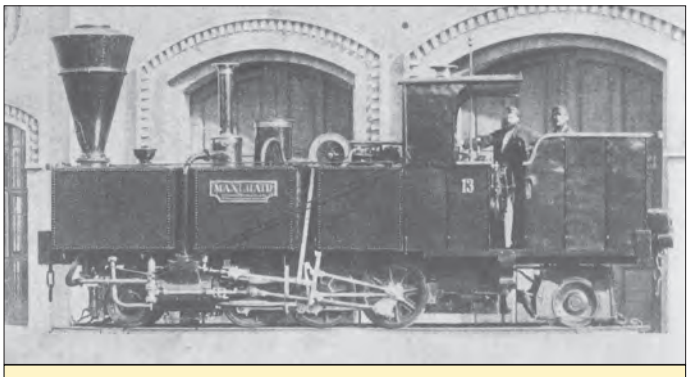
first test run was made on 11 June 1854 between Linz and St. Magdalena using Linz. On the 18th a test run was made between Kerschbaum and Budweis, taking four hours, but was deemed unsatisfactory on account of both the curvature and gradients. The first test run with a freight was on the 21st, Linz hauling a rake of 38 wagons from Linz Südbahnhof (departure at 07.00) to Gmunden (arrival at 17.00). The return run to Linz was on the 23rd. The Ministry of Trade granted permission for commercial operation using steam haulage on 25 August 1854, freights between Linz and Lambach being regularly steam-hauled from 1 March 1855, and passenger trains from 1 May that year. Steam haulage between Lambach and Gmunden-Traundorf was introduced in 1856, and horse traction was withdrawn from the Gmunden to Linz line in 1856, apart from between Gmunden-Trandorf and Rathausplatz. This was only the second narrow gauge public railway in continental Europe to adopt steam haulage, after the 50 km 1,150 mm gauge Antwerpen to Gent line in 1845.

In 1855/6 Wiener Neustädter Lokomotivfabrik supplied four 2-6-0+2Ts, carrying the numbers 11 to 14 and the names MARCHTRENK, NEUBAU, MAXLHAID and ZIZLAU. All 14 locomotives remained in service until 1883, being replaced by a batch of four smaller 0-4-0Ts (numbered kkStB G 1 to 4) built at the Krauss works in München.



EEG locomotive No. 13 MAXLHAID.
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On 8 March 1856 the Austrian Government granted a 90-year concession to the Kaiserin Elisabeth Bahn (KEB) for the construction and operation of a railway, soon to be referred to generally as the Westbahn, linking Wien with Linz and Salzburg. The stretch of 1,435 m gauge main line between Wien and Linz was inaugurated on 15 December 1858. West of Linz the KEB opened negotiations with the EEG regarding a complete take-over, a move to which the directors agreed at their final AGM on 30 June 1857 by 62 to one votes. It was generally agreed that the Linz to Budweis line would have to be rebuilt on a different alignment to make it suitable for steam traction. Between Linz and Lambach the new railway to Salzburg was built at a higher level, further from the floodplain of the Traun than the EEG's railway. However the existing route of the EEG between Lambach and Gmunden was retained, with the construction of a new 3.5 km connecting chord between Lambach and Stadl-Paura. On 4 August 1859 the first test runs were made over the new 37.6 km line between Linz and Lambach, in readiness for inauguration on 1 September. The EEG's railway was subsequently closed and dismantled, with 1,435 mm gauge wagons bound to and from Gmunden were carried on 1,106 mm gauge 'Rollbock' wagons between there and the transhipment sidings at Lambach.

Between Linz and Budweis the EEG was closed in stages as the construction of the new railway advanced. The stretch between Budweis and Kerschbaum was closed on 9 April 1870, with salt temporarily being moved by road between these two locations. On 1 January 1871 the new railway between Zartlesdorf (now Rybník) and Budweis (49.696 km) was inaugurated, while on 1 December that year Zartlesdorf to Summerau (13.876 km) was opened, followed by Summerau to Freistadt on 6 November 1872 (9.419) and Freistadt to St. Valentin, the junction with the Westbahn near Linz (46.486 km) on 2 December that year, when passenger services were introduced over the whole 119.75 km route. The line, which reaches a maximum altitude of 675 m at Rybník, has a minimum curve radius of 251 m and the steepest gradient is 16‰. The last scheduled horse train ran on 15 December 1872 from Linz to Freistadt.

Meanwhile, the KEG decided to modify the railway geography in Gmunden. On 24 September 1871 a 700 m stretch of new 1,106 mm gauge track was inaugurated from Gmunden-Traundorf to a quay at Gmunder Seebahnhof, on the right bank of the Traun. This enabled closure and dismantling of the urban stretch of line serving the quay adjacent to the Rathausplatz.

In 1884 the KEB was absorbed in the kaiserlich-königlichen Staatsbahnen (kkStB). In 1903 the latter started converting the Lambach to Gmunden line to 1,435 mm gauge, reinaugurating it on 31 August that year. The 1.106 mm gauge motive power and rolling stock was then withdrawn.

One of the steam-era 1.106mm gauge passenger carriages, as preserved in kkStB livery in Vienna.
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Gmunden becomes a Kurstadt

In 1860 Dr. Christian Feurstein, from Bezau in Vorarlberg Land, came to live in Gmunden. That year he was elected to the municipal council, and prompted dialogue on the future of the town. He reckoned that the importance of salt trading in the local economy would soon dwindle, and suggested the development of a modern, well-equipped health spa. The project was realised quickly, and the spa complex was inaugurated on 17 July 1862. This officially placed Gmunden on the State-recognised list of health resorts and spa towns. A brochure describing the town and its surroundings was published, thus establishing Gmunden and the Traunsee as tourist attractions.

The Salzkammergutbahn

The origins of this railway lay in a project to build an 18.4 km 1,106 mm gauge line, mainly for the transport of salt, linking the Hallstättersee and the Traunsee, and a concession for this project was duly granted to the Ebensee-Ischl-Steger Eisenbahngesellschaft on 9 December 1869. The trackbed between Ebensee and Bad Ischl was completed by the end of 1873. A worldwide economic crisis that year resulted in the collapse of the bank which was providing the financial backing for the scheme, and the company lost its concession.

A new concession was granted on 27 May 1875 to the Kronprinz Rudolph-Bahn to build a 1,435 mm gauge railway from Steinach-Irdning via Bad Aussee, Steg, Ischl, Ebensee, Attnang and Ried to Schärding. The trackbed and infrastructure (including

station buildings) of the unfinished Ebensee to Bad Ischl line were incorporated in the project. The whole 174.4 km route was inaugurated on 23 October 1877, and the provision of sidings serving the Pfannenhaus in Ebensee resulted in the transport of salt down the Traun by Zillen coming to an end. The salt traffic on the KEG's Gmunden to Lambach line also disappeared. Meanwhile, the railways were able to take advantage of the tourist and health spa traffic. For instance, in 1908 through carriages to Bad Aussee and Gmunden were provided from Wiesbaden. Journey time was 17h16. The line was electrified, at 15 kV DC, between Stainach and Attnang-Puchheim, in 1924, this project being prompted by the post-war coal shortage, which had resulted in service reductions.

Shipping Services on the Traunsee

The Salzkammergut is Austria's 'Lake District', there being no fewer than 76 lakes, of all dimensions. Lakes, however, are barriers to land-based transport systems. The Traunsee, measuring 12 km north to south by 3 km east to west (24.5 km2), saw its first steamer shortly after the arrival of the first railway, in 1839. This came about because John Andrews, one of the founders in 1829 of the joint-stock Donau-Dampfschiffahrts-Gesellschaft in Wien, had a disagreement with one of the other founders of the company, Joseph Pritchard, and resigned. Together with the shipbuilder Joseph John Ruston, he then visited the Salzkammergut, and obtained a concession to operate steamship services on five of the lakes. Ruston duly built the first steamer to sail on the Traunsee, SOPHIE, a wooden-hulled paddler powered by an engine supplied by Boulton & Watt. She entered service in 1839, the very first Austrian lake passenger steamer, linking Gmunden with Ebensee. In 1848, it becoming apparent that SOPHIE's hull was not wearing very well, Ruston built a new steamer, also called SOPHIE, and installed in her the engines from the original vessel.

Ruston established a new shipyard in Klosterneuburg, Wien, in 1854, later moving the establishment to Floridsdorf. Here boilermaking facilities existed, and served for the construction of a boiler for another new Traunsee paddle steamer, ELISABETH, which was assembled at Gmunden and put into service alongside SOPHIE in 1858. Andrews had died in 1847 and Ruston had married his widow, but the two vessels were at that time owned by Andrews' heirs, and it was not until 1862 that Ruston was able to acquire them. SOPHIE (II) was replaced by a new namesake (again powered by the engine from the original vessel) in the 1860s. A fourth paddler, GISELA, was built in 1872. As for the names, SOPHIE was named after Princess Sophie of Bayern, the mother of Emperor Franz Josef, and the third Sophie perhaps after the Emperor's first daughter, who died at the age of two in 1857, while ELISABETH was named after the Emperor's wife, and GISELA after his second daughter (1856 to 1932).

GISELA was built as a set of components at the Floridsdorf shipyard, these then being moved to the yard at Rindbach on the Traunsee for assembly. Her maiden voyage was on 24 September 1871, and she entered service in spring 1872. She is of 135 tonnes, 52 m long, with a beam of 4.954 m and a draft of 1.5 m. Powered by a 143HP compound steam engine supplied by Prager Maschinenfabrik, she is capable of 12 knots, and has a certificate for 250 passengers.

Salzkammergutbahn services between Ebensee and Gmunden killed off much of the local demand for travel by steamer on the Traunsee. However, the railway brought an ever-increasing number of tourists, ensuring the survival of steamer services in summer.

Joseph John Ruston died in 1895 and was succeeded by his nephew, John Ruston. The same year a screw steamer, MARIE VALERIE, built at the Dresden-Neustadt yard, was acquired.

Competition appeared on the lake in 1909 in the form of ELEKTRA, a mere launch with a diminutive shelter placed forward, owned by the tradesman Rudolf Ippisch. Built by Lürßen Werft of Vegesack near Bremen, ELEKTRA, as her name suggests, was powered by batteries, which were charged at a power point in Rindbach. Being much smaller than the paddle steamers, she could call at the smaller landing stages along the lake shore, and thus build up her own patronage, affecting the incumbent operator's passenger numbers seriously. She remained in service until 1968, when she was sold to the Union Yacht Club in Gmunden. In the years prior to the First World War ELEKTRA was followed by four more small battery-powered vessels, TRAUNSTEIN, GLÜCKAUF, SONNSTEIN and KARBACH.

The First World War resulted in John Ruston being interned, and following years of negotiation his five steamers were sold in 1918 to Ippisch, who founded the Traunseer Schiffahrts-Gesellschaft. A certain amount of fleet rationalisation took place, SOPHIE and TRAUNSTEIN being sold in 1920 and MARIE VALERIE scrapped in 1938.

The subsequent history of Traunsee shipping services involves mainly a succession of motor launches, but remarkably GISELA is still in service, although her sister ELISABETH was withdrawn in 1967 and scrapped in 1970. GISELA was withdrawn with boiler trouble in 1975, but reboilered the following year. However she was then withdrawn in 1980, and it was not until 5 July 1986 that she was returned to service, following pressure on the company by the Gesellschaft Freunde der Stadt

Veteran paddle steamer GISELA at her berth on the Traunsee at Gmunden.
Author

Gmunden. Full details of the vessels which have seen service on the Traunsee can be found on Ian Boyle's Simplon Postcards website.

Not quite Where Eagles Dared...

Ippisch decided to invest in another tourist attraction which would increase his passenger numbers. This was a cable car line to the summit of Feuerkogel. He started developing the project in 1919, but was unable to secure financial backing until early 1926, the contract being awarded to Adolf Bleichert & Co., an industrial ropeway builder with an international market. Inauguration of the 2,693 m long line, which ascends 1,109 m from an altitude of 475 m to 1,584 m, was on 26 June 1927. The line hit the headlines on 23 September 1963 when a bomb was found in one of the cars, planted there by a group of Italian extremists. In 1968 it was used for scenes in the film 'Where Eagles Dare', starring Richard Burton and Clint Eastwood, and based on a novel by Alistair MacLean. The fictitious fortress in the film and book, reached only by cable car, and known as Schloß Adler, is in fact the Hohenwerfen in Werfen, in Salzburg province. Since 1984 the cable car has been owned by Oberösterreich Land, via the operating company Traunsee Touristk.

One of the gondola cars on the Feuerkogel cable car.
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Gmunden's Urban Tramway

In Gmunden, the Salzkammergutbahn station, known locally as the Rudolfsbahnhof, is at an altitude of 479 m, whereas Rathausplatz in the town centre, on the lake shore, is considerably lower, the Traunsee being 423 m above sea level. In 1875 a pressure group had been formed to ensure that the Salzkammergutbahn was not built through the town centre, since the passage of trains would disturb the tranquility of the place as a spa resort. The pressure group succeeded only too well in its aims, with the station being situated high on the hillside near the village of Pinsdorf. It soon became clear that this was a serious mistake, with complaints being voiced by visitors and locals alike that it was difficult of access. Gmunden's mayor, Alois Kaltenbrunner, was not happy about it either, and proposed a tramway between the station and town centre. He was also keen in having Gmunden provided with an electricity supply for lighting, since the spa town of Bad Ischl had had this since 1890. But electric lighting alone would not have been a profitable venture, the municipal coffers having recently been depleted through the need to finance a water supply for the town. A project involving both electric lighting and an urban tramway was regarded as a much sounder venture.

The contract for building the tramway was awarded in winter 1893/4 to the Wien-based construction firm of Stern & Hafferl OHG, the contractor being Egger & Co., under the supervision of Josef Stern. Metre gauge was chosen, since the military would have had a right to intervene in the project, with possible delays and re-specifications, had 1,435 mm gauge been adopted. During the afternoon of 21 July 1894 the first test runs were made, in readiness for the public inauguration of the line in the afternoon of 13 August. In the morning of the 13th various horse-drawn vehicles were positioned close to the line during the final test runs to familiarise the animals with the sight and sounds of the trams. The Gmunden tramway thus became the third electrified railway in Austria, after the 4.4 km metre gauge Mödling to Hinterbrühl interurban tramway of 1883 (550 V DC) and the 3.24 km 1,435 mm gauge Baden to Rauhenstein and Helenental tramway, near Wien, of July 1894.

Electrified at 600 V DC, the Gmunden tramway was originally 2.54 km long, with 11 intermediate stops and with gradients as steep as 100‰. Nowadays it ranks among the steepest adhesion railways in Austria and Europe. The steepest is the 900 mm gauge Pöstlingbergbahn in Linz, which reaches 116‰ in places, while some parts of the Lisboa tramway network are even steeper. Gmunden's tramway is also the oldest in Austria, but as we shall see, will very soon lose its status as the country's shortest tramway. During the remainder of 1894 Stern & Hafferl, now Austria's largest privately owned public transport operator, ran the line. However in January 1895, once Gmunden had its municipal electricity supply functioning, the local electricity company, Gmundner Elektrizitäts-Aktiengesellschaft (GEAG) assumed the role of operator, Stern & Hafferl taking over again in 1925.

Services were originally operated using three trams (1 to 3) supplied by Rohrbacher, with electric equipment by AEG. They were joined in 1895 by a fourth, from the same manufacturers, in 1907 by two (6 and 7) from Siemens and Grazer Waggonfabrik, and in 1911 by another (5) from the same manufacturers. Of these the sole survivor today is 5, which is part of the heritage fleet. Services until very recently were maintained by a diverse group of younger veterans. Lohner/Kiepe supplied 8 in 1961, while 9 and 10, dating from 1952, came from Vestische Straßenbahnen (whose network served Recklinghausen, Bottrop and Gelsenkirchen until 1982) in 1977 and 1983 respectively. In 1995 one of the Pöstlingbergbahn trams, GM100, built by Grazer Waggonfabrik in 1898, was acquired and regauged, and this of course is part of the heritage fleet.

Car No. 1, supplied for the opening of the line in 1894, navigates the streets of Gmunden.
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The heritage tram fleet line up outside the depot at Gmunden. The tram on the left, No. 100, came from the Pöstlingbergbahn in 1995. Behind it is Gmunden No. 5, supplied new in 1911. The adjacent No. 8 was delivered new in 1961, whilst 9 and 10 on the right arrived from the Vestische Straßenbahnen in 1977 and 1983 respectively.

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deterring tourists from Germany was the Tausend-Mark-Sperre, imposed by the German Reich on 27 May 1933. Under this economic sanction, designed to damage the Austrian tourism industry, German citizens were obliged to pay 1,000 Reichsmarks at the border to enter the country. This was lifted following an agreement reached on 11 July 1936.

The annexation of Austria by Germany in March 1938 resulted in what was until then regarded as a local railway being redefined as a street tramway. On 1 April that year the line came under Bau und Betrieb der Straßenbahnen (BOStrab) legislation – which applies today to all German tramway and tram-train systems. One noticeable change was in the use of signs indicating where stops were located. These were now the standard yellow ones with a green "H' (for 'Haltestelle'), similar to those found at tram and bus stops today in Germany. The legislation was not repealed following the end of the war.

With private cars being scarce, patronage rose, to 586,404 in 1944 and to a record 736,898 in 1946, falling to 494,862 in 1962. The maximum line speed was increased to 25 km/h in 1951, and upgrading, including the replacement of rails, took place in 1956 and 1957.

On 6 June 1975 the 220 m of line in the town centre between Franz-Jozef-Platz and Rathausplatz was closed, on account of road traffic congestion in the narrow streets of the town centre, and Rathausplatz thus lost its second railway, 104 years after the first had been closed. However the trak remained in situ, and was not completely removed until 2015 when road resurfacing took place. The closure resulted in a substantial drop in patronage, prompting the introduction of one-man operation as an economy measure on 3 July 1978.

In 1988 Stern & Hafferl, fearing the risk of closure of the line, organised a petition campaigning for the preservation of the Trauntalbahn. The owner, Lokalbahn Lambach-Vorchdorf-Eggenberg AG, entrusted operation to the kkStB, which employed a variety of steam locomotives. The economic crisis of the late 1920s and early 1930s prompted Lokalbahn to hand over responsibility for the line to Stern & Hafferl, this formally taking place on 1 May 1931. Stewrn & Hafferl wasted no time in electrifying the route, using 750 V DC overhead. This was completed on 14 November 1931. services are provided by a fleet of elderly Class ET20/22/25 motor cars and driving trailers built by Westwaggon, Grazer Waggonfabrik and Waggonfabrik Rastatt between 1932 and 1956. In the future dual-voltage EMUs are to be acquired, to enable services to be extended onto the ÖBB line, electrified at 15 kV AC, from Lambach to Wels.

At Vorchdorf-Eggenberg station facilities are shared with yet another Stern & Hafferl local railway. This is the metre gauge, 15 km Traunseebahn to Gmunden, inaugurated on 21 March 1912 and electrified from the start at 750 V DC overhead. In Gmunden it joined the Trauntalbahn between Gmunden-Engelhof and Gmunden-Lembergweg, there then being a short stretch of three-rail dual-gauge track, before the metre gauge diverged to terminate at Gmunden-Traundorf.

Very soon after inauguration came the first proposals for linking up the urban tramway with the Traunseebahn (essentially reinstating the pre-1871 EEG line, though to metre gauge). These did not prosper. However in 1990 the dual gauge track was extended westwards from Traundorf to Gmunden Seebahnhof, on the lake shore, thus closing the gap somewhat.

In the late 1980s another of the suggestions put forward by Verein Pro Gmundner Straßenbahn was for the integration of the urban tramway with the Traunseebahn. By 2016 this association had raised around 200,000 euros for tramway projects and public relations in the Gmunden district. However it was not until after the turn of the millennium that this project was formally revived, being approved by the municipal council in April 2003. The work would involve the reinstatement of the urban tramway to Rathausplatz, then construction of an extension over the Traun to Gmunden Klosterplatz. The existing bridge over the Traun would have to be replaced or widened, to accommodate both the main road and the tramway.

The project took a full decade to assume its definitive shape,

A plan of the Gmunden tramway, clearly showing the "missing link".

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a definitive decision to go ahead being taken by the town council in February 2013. Not only would the urban tramway and the Traunseebahn be united, but a new fleet of trams – more accurately Light Rail Vehicles (LRVs) would also be required. On 27 January 2014 in Gmunden Rathaus a 30 million euro contract was awarded to a consortium formed of Vossloh Kiepe Austria (consortium manager) and Vossloh España for 11 five-section, bi-directional 70 km/h Tramlink 2.0 LRVs, designed to operate off both 600 and 750 V DC. Vossloh Kiepe developed, manufactured and delivered all the electrical equipment, control systems, air conditioning and drivelines for the new vehicles, while the general development of mechanical parts, bodyshell and bogie construction, final assembly, fitting out and testing took place at Vossloh España's Albuixech works in València (since early 2016 Stadler València). The contract included the supply of spare parts, logistics and maintenance over a 16-year period. Vossloh Kiepe and Vossloh España/Stadler also provided training for Stern & Hafferl employees.

StadtRegioTram - Restoring the Missing Link

By 2014 work was in full swing to bridge the gap between the rail networks on the lakeside. The third rail for 1,435 mm gauge track between Gmunden-Traundorf and Gmunden-Seebahnhof had been lifted in early 2009. In autumn 2011 two Flexity trams were hired for use on the Traunseebahn for a four-year period from Innsbrucker Verkehrsbetriebe und Stubaitalbahn GmbH. These entered service following a media event on 19 September. On 10 March 2014 the relocation of Seebahnhof terminus began, with a new through Seebahnhof station inaugurated on 18 June that year, the 200 m extension thence to Klosterplatz being inaugurated on 13 December 2014.

Deliveries of the Tramlinks started in late 2015 and were completed on 2 June 2016. A new 6 million euro depot and works was built at Vorchdorf. This was inaugurated on 12 March 2016, the event coinciding with the presentation of the first three Tramlinks, TRAUNSEE (121), TRAUNSTEIN (122) and LAUDACH (123), which during the afternoon were used on a shuttle service to and from Gmunden Klosterplatz. The inaugural Tramlink run was at 14.57 from Vorchdorf-Eggenberg, non-stop to Gmunden Seebahnhof and Klosterplatz (15.23), and after that the new vehicles operated 11 pairs of public services until the end of the day.

By spring 2016 public utility relocation and modernisation was in progress between the tramway terminus in Franz-Josef-Platz, Rathausplatz, and the twin arches under the Kammerhof Museum, on the left bank of the Traun, in readiness for tracklaying. Planning work for the new river bridge was completed by December 2015. There was an element of public opposition to the project, and the matter was eventually resolved in court.

In 2015 the Salzkammergutbahn station was rebuilt, the tramway being realigned and given its own platform inside the station. This offers barrier-free access, and passengers changing to and from trains no longer have to cross the street, as they did in the past.

On 22 July 2016 the tramway infrastructure between Am Graben and Rathausplatz stops in Gmunden town centre was completed. The previous evening Gmunden municipality and Stern & Hafferl held a street party there for the benefit of those involved in the work, and also for local residents and business proprietors, who may have been inconvenienced by the construction activity. Herirtage tram GM100 tram was hauled to Rathousplatz for the event by Stern & Hafferl's infrastructure maintenance lorry, since the overhead wire had not yet been erected.

Following this event, work on the tramway extensions was halted until 29 August on account of the number of visitors to Gmunden during the holiday period. The next stage of the project involved a completely new short section of urban line eastwards along Kammerhofgasse from Rathausplatz to Trauntor (the arch under the building housing the Kammerhofmuseen), near the bridge over the Traun river, with completion scheduled for prior to the start of Advent on 25 November 2016. Work is also in progress on the eastern side of the bridge, to extend the tramway track westwards from Klosterplatz by about 60 m. Work to adapt the bridge for incorporation of the tramway started in October 2016.

Proposals also exist to extend the StadtRegioTram network along the Trauntalbahn to Laakirchen (9 km from Gmunden-Klosterplatz). This would involve providing a bridge over the by-pass road (here in a shallow cutting) and laying either dual-gauge or metre gauge track. Because of the changes which took place in local government following the elections of September 2015 there is uncertainty over the future of this project, at least for the near future.

During the evening of 13 March 2017 Tramlink 129 was

Three views of the operation to reinstate the link over the River Traun, to facilitate light rail operation between Gmunden's two standard gauge heavy rail stations.

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The brightness of the lights gives away the time of day as Stadler LRV 122 TRAUNSTEIN waits for customers at Klosterplatz.

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moved by low-loader from Vorchdorf depot to Franz-Jozef-Platz, to realise a series of traction, adhesion and braking tests, loaded and empty, at various speeds and under a wide range of adhesion conditions (wet and dry track), on the steeply graded urban stretch of line. A load of 'passive passengers' was carried for these test runs - 17 tonnes of bagged sand! Test running with passengers on board started on 26 March, this phase expected to last for several weeks.

The 'Salt Trail': What to See and Do

The salt mines in Berchtesgaden (Salzburg, see https://www.salzbergwerk.de/en), which celebrates 500 years of continuous production in 2017, Hallein, Hallstatt and Altaussee (see https://www.salzwelten.at/en/home/) are all open to the public and offer an incredible selection of guided tours, making use of rail, funicular, water and subterranean inclined slide.

Between Hallstatt and Ebensee it is possible to follow on foot the route of the brine pipeline (the tree trunks were replaced by plastic pipes many years ago) using the Soleweg, information on the Hallstatt municipal website (http://www.hallstatt.net/ueber-hallstatt/aktiv-urlaub-im-salzkammergut/wanderzeit/wandern-hallstatt/soleweg/). The one-way downhill walk takes about a day, but since both Ebensee and Hallstatt are linked by the Salzkammergutbahn, on which there are hourly trains, a round trip is easily possible, provided one reaches Ebensee in time for the last train of the day to Hallsatt at 20.42! The ÖBB website has timetable pdfs - search for Line 170 Attnang-Puchheim to Stainach-Irding.

Shipping services on the Traunsee are provided by Traunseeschifffahrt (http://www.traunseeschifffahrt.at), with a fleet of five vessels – GISELA, POSEIDON, KARL EDER, MARIA THERESIA and the veteran RUDOLF IPPISCH of 1928, built by Schouten Muiden in the Netherlands. The website also has pdfs with simplified general arrangement plans of each of the vessels. Regular sailings were offered in 2017 between 29 April and 27 October, linking Gmunden Rathausplatz and Gasthof Hoisn or Ebensee. GISELA was active throughout July and August, only on Sundays.

There are two cable car lines in the vicinity of Gmunden – the Feuerkogel- and the Grünberg-Seilbahn. The latter (see http://www.gruenberg.info/sommer/service/betriebszeiten/) starts not far from the site of Gmunden-Seebahnhof. The original line was built in 1957, and was fully rebuilt in 2013/4 at a cost of 10 million euros. 2,025 m long, it rises through 551 m to an altitude of 987 m, amnd has a capacity in each direction of 618 passengers per hour, each car being able to carry up to 60m passengers. The Feuerkogel line's lower terminus is situated about 1 km west of Ebensee Landungsplatz halt, up the Langbathstraße, which accesses the Vorderer Langbathsee. The ski and leisure complex at the summit (see http://www.feuerkogel.net/winter/feuerkogel/) includes a hotel, in which none of the rooms are en-suite, the prices being accordingly low.

Stern & Hafferl Verkehr (http://www.stern-verkehr.at) is the main local public transport operator in the Gmunden district, but is also active in other parts of northern Austria. The website (see 'Downloads') includes pdf timetables for the Gmunden urban tramway, the Gmunden to Vorchdorf line (both on average half-hourly headways), and that from Vorchdorf to Lambach (mostly hourly). Between Gmunden and Vorchdorf services are maintained using the Tramlinks, with electric railcar 20.103, built by Grazer Waggonfabrik in 1921, as a heritage vehicle for charter and special events.

Nearly a century after closure, in 1970, the surviving remains in Austria of the EEG were declared cultural monuments, and have thus been preserved. Kerschbaum station is now a museum, with a stretch of track on which horse-drawn trains run. There is another short stretch of reconstructed track on the hillside at Linz-Magdalena, while Lambach station in Stadl-Paura has been preserved. Gmunden-Englhof station is reckoned to be the oldest surviving railway station in Europe still in use (there are of course no trains at present, though). Most of the trackbed from Linz to Bujanov in Český Krumlov district has now been revived as a waymarked footpath (see http://www.pferdeeisenbahn.at).

Similarly, there are many remains of the Schwarzenberský kanál (see http://www.treking.cz/regiony/schwarzenbersky-kanal.htm and http://www.schw-kan.com), and on occasions some of these are used for demonstrations of log floating. There is also a canal museum at Chvalšiny, near Český Krumlov (see http://www.chvalsiny.cz/obec/muzeum).

Ex-Pöstlingbergbahn No. 100 leaving the station at Tennisplatz. *Author*