

# CONSERVING THE ROMANIAN RAILWAY HERITAGE. CASE STUDY: LOCOMOTIVES

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**ABSTRACT:** Every country's railway heritage is very important, given the fact that it represents an important part of a nation's identity. Romania has a vast network of railways and rolling stock, from steam locomotives built in Resita in the 1900s, to modern day electric locomotives with asynchronous traction motors built by Softronic Craiova. This article's goal is to showcase the reasons why conserving Romania's railway heritage is important, especially when it comes to locomotives. In this article we will analyse Romania's locomotives and their attributes. The results show us that, although locomotives are an important part of Romania's heritage that the country should be proud of, they are not valued to the fullest extent possible.

**Keywords:** trains, locomotives, railway heritage, conservation, territorial identity

## 1. INTRODUCTION

The concept of railway heritage came about around the same time as the diesel engine, in the 50s and 60s, when a lot of railways saw major developments. Since then, conserving and keeping the past has been very important. For instance, in Great Britain, when the "end of the steam era" took place, the country started using what now represented railway heritage for tourism (Conlin, 2014).

Both globally, and on European level, there are multiple ways of getting the most out of railway heritage. Compared to Eastern Europe, where Romania is, in Western Europe we find all out railway museums, with unique pieces. There are 30 railway museums in Germany and Great Britain alone, while in Eastern Europe the situation is a lot more dire. In Romania and Hungary there are 4 such museums, in Bulgaria just one (Dickinson, 2019). In Europe, we can also find special tourist trains that generate tons of yearly revenue, such as "Glaciar Express" from Zermatt to St. Moritz, Venice Simplon Orient Express (Paris - Istanbul, Istanbul - Venice) which passes through Romania every year and the Trans Siberian (Moscow - Vladivostok) (Plush, 2022; Bukov et al., 2022).

29 countries worldwide have pieces of railway heritage included in the UNESCO World Heritage Centre, while Romania has nothing associated to railways, despite being a country with a vast network of railways and rolling stock

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built over the years. From steam locomotives built in Resita to modern day electric locomotives with asynchronous traction motors built by Softronic Craiova. Over the years there have been a lot of changes in the history of Romanian railway heritage. After 1990, the government's investments in railways have been superficial at best and declaring narrow gauge railways (such as Turda - Abrud) as "unprofitable" harmed the railway industry.

The aim of this article is to show off the Romanian railway heritage, with a particular focus on locomotives, the work being part of a territorial planning project.

## **2. RAILWAY HERITAGE - LONGITUDINAL PROFILE**

The railway network usually has a crucial role in the human communities it serves, one of its goals being improving their quality of life (Sprinceana, 2022). The 2018 earthquake in Indonesia, which destroyed a big part of its railway network, made it impossible for thousands of children to get to their educational facilities (Anderson, 2022).

The story of the railway started with the British industrial revolution in the 18th century, when animal traction was replaced with the steam engine, designed by Thomas Saverey, and, at the start of the 19th century, Richard Trevithick built the world's first steam locomotive, reaching speeds of 8kph. In 1825, between Stockton and Darlington the world's first public railway, the "Locomotion No. 1" opened for freight transport. Five years later, in England, the first passenger railway opened, being followed by railways in France and Germany. Before the industrialization, the nordic countries were considered "the poor side of Europe". But, as transport evolved, the nordic countries saw massive industrialization. Railways have also allowed for the export of natural resources from places that, before railways, were considered too isolated (Enflo, 2018).

In 1854, Romania opened its first railway line, between Oravița and Baziaș (Bellu 2006). The railway industry was then heavily improved over the years, from locomotives to speed, safety and comfort (Sprinceana, 2022). In the post-communist era, Romania has not made any major investments into railway and therefore the big Romanian industrial railway operators see annual losses (for instance, TMK Alrom Slatina, producer of industrial pipes, Tenaris Silcotub Zalau) (Botea, 2021).

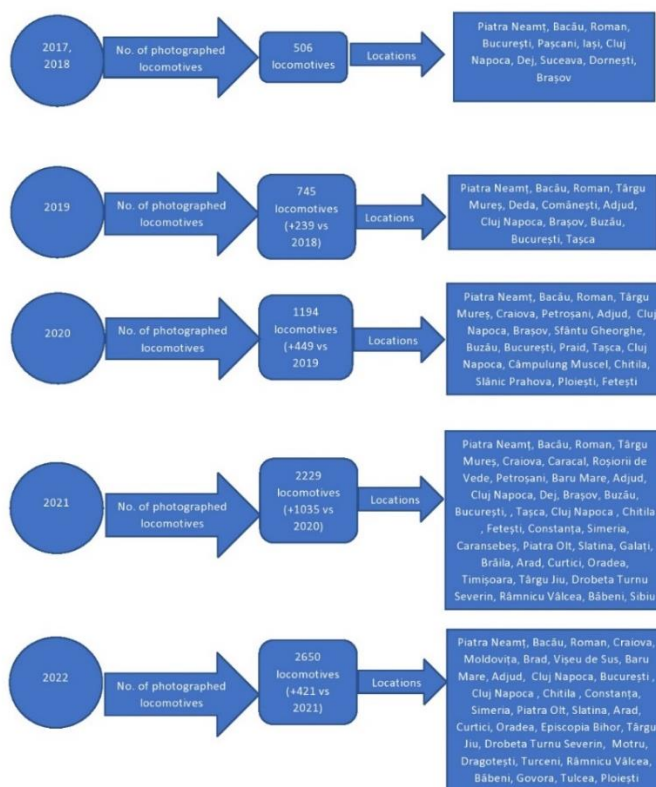
Other than cultural heritage, the industrial heritage has its own scientific value (Fuying, 2018) and represents a challenge for territorial planning and urban conservation (Xie, 2015). A good example of capitalizing on industrial heritage is the LX factory in Portugal, a cloth factory that was abandoned then turned into artistic space (Xie, 2015).

Societatea Feroviară de Turism (The National Tourism Society) has been

in insolvency since 2013. Steam locomotives, shown off in railways stations or museums, the "Moldovița" train, the "Royal" train and the "Călugăreni" train, whose locomotive is in the Railway Museum in Bucharest (Societatea Feroviară de Turism 2013) can be considered pieces of heritage. CFR (the Romanian Railways) also owns plenty of buildings and offices that can also be considered heritage (CFR SA 2013). The Oravița - Anina railway, which today only sees two tourist trains per day, operated by CFR Calatori, is part of the railway heritage, with many railfans wanting it to be included in the UNESCO Heritage (Consilii 2015).

### 3. Materials and methods

New technologies allow us to digitally store images and information that are part of our heritage and the creation of digital 3D Models (Hold, 2021). In this study's case, we will focus on locomotives, the elements of railway heritage that are best conserved nationally, compared to other railway components (stations, wagons, rail lines).



**Fig. 1.** Photographic documentation associated with locomotives in Romania

The following analysis of the current situations was achieved thanks to an intense documentation on the field, between 2017 and now, by photographing and sorting 2600 locomotives (found in places such as railway stations, depots, and various industrial places and factories from all over Romania).

Various locomotive types were photographed, pointing out certain characteristics. Other than my documentation, some information has been received verbally. Also, various railway internet pages (trenuletz.forumz.ro, railnmet.ro, cfr.stfp.net) as well as Google Earth and Google Maps and various scientific articles have contributed to discovering new information.

## **4. RESULTS**

### **4.1. Romanian locomotives - current situation**

Romania is a very diverse country when it comes to railways, having the 7th biggest railway network in the European Union, at 20.077 kilometers (CFR SA 2013).

So far, we have identified normal gauge steam locomotives, that are publicly shown off, including 130.500, 230.000, 231.000, 40.000, 140, 142.000, 50.000, 150.000 series as well as narrow gauge locomotives such as series 763 and 764. As far as diesel locomotives are concerned, we have identified locomotives built by Electroputere Craiova: LDE2100 (060-DA), LDE4000 (066-DD), as well as locomotives built by FAUR Bucharest/Uzinele 23 August: LDM12, LDH125 (040-DHC), LDE125 (040-DF), LDH45 (040-DHA), LDH70 (040-DHB), LDH18, LDH25, L35H, L45H, L18H, LDE130, LDE150. When it comes to electric locomotives, we have identified LE5100KW (060-EA) locomotives, built by Electroputere Craiova, LE3400KW (040-EC) locomotives built by Rade Koncar Zagreb for CFR, as well as newer locomotives: LE5100KW Phoenix and LE6600KW Transmontana (LEMA) built by Softronic Craiova.

#### **4.1.1. Steam locomotives**

Perhaps the most important type of locomotives when it comes to railway heritage are steam locomotives. Sadly, unlike many western European countries, such as the UK (The Northern Belle train), Germany, Belgium, Slovakia, The Czech Republic and Hungary, which make huge profits by using steam locomotives for tourists (Dartford, 2021), in Romania there is no normal gauge steam locomotive still in use.

Still, thanks to a bunch of dedicated people that managed to save them from the scrapyard, a lot of steam locomotives are now shown off in various railway stations, or preserved in depots. Nationwide, there are 4 museums that feature steam locomotives:

- Dej, where the Dej Triaj CFR Marfă depot is also a museum (Fig. 2);
- Sibiu, the CFR Calatori depot (Fig. 3);
- Teiuș, a smaller museum (Fig. 4);
- Reșița, open museum (Fig. 5).



**Fig. 2.** 150.105 steam locomotives in the Dej Triaj depot/museum  
Photo: Matei-Ștefan Lutz, 2021



**Fig. 3.** 150.1105 steam locomotives, in the Sibiu Railway museum  
Photo: Matei-Ștefan Lutz, 2021



**Fig. 4.** 230.171 steam locomotive in the Teiuș railway museum.  
Photo: Matei-Ștefan Lutz, 2021



**Fig. 5.** The first Romanian steam locomotive, Resicza 2 in the Reșița Railway Museum  
Photo: Mihai Alexandru, 2020

Also, some Romanian cities have various steam locomotives shown off near their railway stations. The Romanian government does not seem to care about railway museums, unlike countries such as Slovakia and the Czech Republic, which have greatly supported their railway museums, especially after 1990.

A special mention goes to the Subcetate-Hățeg-Bouțari railway, which had class 40 CFR steam locomotives on duty, built in Hungary (Lacriteanu, 2007) (Fig. 7). At this point in time, in Romania, we only managed to find numbers 001, 004, 005 and 007. None of them are still functional and the railway no longer physically exists.

In Romania, after 1990, over 1000kms of narrow gauge railway has been destroyed, because they'd been considered unprofitable (Avram, 2018), unlike in Great Britain where narrow gauge railways are being used for tourists (Erkan, 2012; Crapper, 2014).







**Fig. 9.** 764.404 steam locomotive, with a tourist train from Argel, in Moldovița  
Photo: Matei-Ștefan Lutz, 2022



**Fig. 10.** 764.408 steam locomotive, with a tourist train, in Vișeu de Sus  
Photo: Matei-Ștefan Lutz, 2022

**Table 1.** Functional narrow gauge steam locomotives from Romania

Locomotive	Location
764.4 - Crișcior	Atelierele CFI Crișcior
764.5 - Crișcior	Atelierele CFI Crișcior
764.052	Mocănița Sovata - Câmpu Cetății
764.159	Atelierele CFI Crișcior
764.211	CFF Vișeu
764.404	Atelierele CFI Crișcior
764.408	CFF Vișeu
764.421	Atelierele CFI Crișcior
764.423	Atelierele CFI Crișcior
764.431	CFF Vișeu
764.435	CFF Vișeu
764.449	CFF Vișeu
764.469	CFF Vișeu
764.480	CFF Vișeu

Source: Field documentation (2017-2022)

#### 4.1.2. Diesel Locomotives

##### a). First Romanian diesel locomotives

In 1936, the first Romanian diesel locomotives were built by the Malaxa Works (currently known as Faur Bucuresti). This first breed of diesel locomotives had a 120HP diesel mechanic engine and a maximum speed of 50kph (Hoanca, 2002). 517 of those locomotives were built in total, with only 20 still in existence today across the whole country. Initially known as class 20, they have been reclassified as class 95. Of those, we found some in the Timișoara depot and the Dej Triaj depot (Fig. 11), and inside the Cieh Soda Govora factory (Fig. 12).



**Fig. 11.** LDM12 20 193, in the Dej Triaj Museum

Photo: Matei-Ștefan Lutz, 2021



**Fig. 12.** A LDM12 locomotive inside the Cieh Govora factory

Photo: Matei-Ștefan Lutz, 2022

*b. Diesel electric locomotives built by Electroputere Craiova*

The 2100HP diesel electric locomotives, also known as 060-DA, built by the old Electroputere Craiova factory are perhaps the most important and most widely used diesel locomotives in Romania. They are still in service for both passenger and freight train and have the potential to become important pieces of railway heritage. Their story begins in 1959, when the first 6 locomotives of this type were built in Switzerland, for the Brașov CFR Depot. A year later, the license is transferred to Electroputere Craiova. Initially, a contract of 10 locomotives was awarded to Electroputere. 1961 will forever remain a very important year for the Romanian Railways as the first such locomotive is built here (Fig. 15). The demand kept rising, so, by 1974 Electroputere had built 826 such locomotives, both for Romania and export into other countries. The last 060-DA locomotive was built in 1988. In 1968, due to the need of higher speed trains, the first 060-DAs capable of hitting 120kph were built, known as 060-DA1 (Class 62), while the regular 060-DAs (class 60) could only reach up to 100kph (Hoanca, 2002). In total, 1407 060-DA and 060-DA1 locomotives were built for the Romanian Railway, 160 for various Romanian industrial enterprises, 420 for PKP (The Polish State Railways) (rebranded as ST43), 130 for BDZ (Bulgarian state Railways) and 379 for China (rebranded as ND2, with modified cabs) (CFR-Istorie și Cotidian, 2020). Today, in Romania, you can find ST43s built for Poland (after being purchased by private railway operators and being brought back to Romania), as well as the final 20 ND2 locomotives for China, which were purchased by Grup Feroviar Roman and have been numbered from 1501 to 1520 (Fig. 14).





**Fig. 13.** ST43 336, which belonged to PKP, awaiting to be repaired in EuroEst Constanța

Photo: Matei Ștefan Lutz, 2022



**Fig. 14.** ND2 60 1502, brought back from China, of Grup Feroviar Român, with a freight train in Piatra Neamț

Photo: Matei-Ștefan Lutz, 2021

060-DA locomotives can also be found in countries such as Serbia, Hungary, Italy and even Spain, most of them being purchased from CFR or industrial operators. Both CFR Calatori and CFR Marfa currently own less than 500 such locomotives, a lot of them being either scrapped or sold to the private operators. Of those, over 50% are conserved, with the rest of them being in service. These can be found in all depots of CFR Calatori and CFR Marfa. CFR Infrastructura also owns 060-DA locomotives, but only four, of which only one, 060-DA 168 is active. DA 168 deserves a special mention, because, as opposed to other CFR Marfa and CFR Calatori locomotives, it maintained its classic look. It still has the old number plates, as opposed to the new European UIC-12 sticker number, it still has the classic whistle as opposed to the regular horn that most other 060-DAs have been fitted with, it wasn't modernized in any way and keeps the classic livery (Fig. 16). Most 060-DAs of CFR Calatori were modernized by INDA Craiova. This modernization adds a train heating unit and replaces the classic driver's cab with a more modern one. Some CFR Marfa locomotives, though not all of the, were modernized by Promat Craiova.

Industrial 060-DA locomotives are also of great heritage. Complexul Energetic Oltenia (Oltenia Energy Complex) is one of the best industrial railway operators when it comes to preserving the past glory of 060-DA locomotives. Their 060-DA locomotives are timeless and a living image of the past, thanks to prompt repair jobs and beautiful liveries with a classic vibes. Unfortunately, new laws regarding their registration mean they have lost their classic number plates and are instead using the new UIC-12 sticker numbers, but that's about it in terms of compromises. 060-DA 1604 and 060-DA 1620 (Fig. 17, 18) are great shining examples of CEO Oltenia's aforementioned love for their locomotives.



**Fig. 15.** 060-DA-001, the first of its kind, built in Switzerland, at an event celebrating 60 years of diesel electric traction in Romania, in Brașov  
Photo: Matei-Ștefan Lutz, 2019



**Fig. 16.** 060-DA 60-0168-9, with a railway maintenance wagon in Piatra Neamț  
Photo: Matei-Ștefan Lutz, 2021



**Fig. 17.** 060-DA 60 1604-7, repaired by Constantin Grup, stabled in Turceni Thermal Power  
Photo: Matei-Ștefan Lutz, 2022



**Fig. 18.** 060-DA 60 1620-3, repaired by Constronic Craiova, with a coal freight train in Motru  
Photo: Matei-Ștefan Lutz, 2022

At this point in time, Complexul Energetic Oltenia owns 28 060-DA locomotives. It is also the only industrial company in Romania with such a large number of functional locomotives. However, there are also other industrial operators that own 060-DA locomotives, such as Alum Tulcea, Alro Slatina, Heidelbergcement Tasca (Fig. 19). Also, a bunch of private operators have also purchased 060-DA locomotives, such as Grup Feroviar Roman, Constatin Grup, Vest Trans Rail, DB Cargo Romania, Unicom Tranzit, CER Fersped, Tim Rail Cargo, Express Forwarding, Via Terra Spedition, Cargo Trans Vagon, Transferoviar Grup, Fox Rail and Train Hungary. I have identified over 200 locomotives belonging to such operators.

59 060-DA locomotives were modernized by General Motors and ElectroPutere Craiova for CFR Calatori.

Another, lesser known type of Romanian diesel electric locomotive is the class 71 DD locomotive, nicknamed "Didina". 35 such locomotives were built, featuring a 4000HP ALCO engine. But, because of their poor reliability record, they were removed from service in 1995 (Forumul Vehiculelor, 2010). The only

CFR class 71 locomotive still in existence happens to also be the very first one 71-0001-2 (Fig. 20). It lies abandoned in the Brasov rail yard, with its current owner a mystery.



**Fig. 19.** 060 DA 001 industrial unit preserved inside Alum Tulcea factory  
Photo: Matei-Ştefan Lutz, 2022



**Fig. 20.** 066-DD 71 0001, preserved in Brasov yard  
Sursa: Matei-Ştefan Lutz, 2020

*c. Diesel Hydraulic locomotives built by FAUR Bucurest*

Built by Uzinele 23 August (The 23 August Works), later rebranded as Faur, most Romanian diesel hydraulic locomotives were designed mostly for shunting activities.

They are pretty diverse, with the most well known model being the LDH125 (1250 HP), also known as 040-DHC (Class 80/81). 1453 such locomotives were built, 1109 for the Romanian Railways and various Romanian industrial operators, and 344 for export to other countries. The first such locomotive was built in 1967 (Monografia Uzinelor Malaxa 2008). Unfortunately, most of them have been scrapped throughout the years though they can still be found in service, both by CFR Marfa/Calatori and private/industrial operators. They have a max. speed of 100kph. CFR Calatori and CFR Marfa currently own 300 such locomotives.



**Fig. 21.** LDH1250 81 0778-4, being repaired at Remarul 16 Februarie Cluj, being delivered to CEO Motru  
Photo: Matei-Ştefan Lutz, 2022



**Fig. 22.** LDH1250 81 0064, with a CFR Infrastructura train in Chitila  
Photo: Matei-Ştefan Lutz, 2022



Some locomotives belonging to industrial and private operators are numbered from 700 to 953 (Initially, every company had its own numbering system, before certain laws mandated a nationwide system). Comleul Energetic Oltenia owns 10 LDH125 locomotives, in their Motru and Jilt (Dragotesti) depots.

Other FAUR locomotives include the LDH45 (040-DHA) and LDH70 (040-DHB) (Hoanca 2002). Although they are pretty rare these days, they can still be found in use at various industrial companies, but most of them have been scrapped or abandoned. 773 LDH45s have been built, of which 492 for CFR and industrial operators and 281 for export. As far as LDH70 locomotives are concerned, 993 of them were built, of which 881 for CFR and industrial operators and only 112 for export. Currently, CFR Calatori and CFR Marfa have less than 10 LDH45/70 locomotives. Although CFR does not seem to care much about them, some industrial enterprises are still using them for shunting activities, such as Remarul 16 Februarie, which own the 85-0169 LDH70 locomotive.



**Fig. 23.** LDH70 85 0169, inside Remarul 16 Februarie  
Photo: Matei-Ștefan Lutz, 2022



**Fig. 24.** LDH45 86 0121, inside TMK Artrom Slatina  
Photo: Matei-Ștefan Lutz, 2022

On the other hand, I have found 50 LDH45/70 locomotives abandoned in various places around Romania, such as LDH70 127 from the old Rulmentul Brasov factory and LDH45-396 of IML Craiova. Some LDH45 locomotives have a slightly altered design. These locomotives are known as LDH45M, and are used by operators such as Rail Force Brasov, Trans Rail Roman and TMK Artrom Slatina (Fig. 24).

#### *d). Narrow gauge diesel locomotives*

Narrow gauge diesel locomotives are used on the old narrow gauge railways, being considered railway heritage. The most well known narrow gauge diesel locomotive is the L45H, built by FAUR Bucuresti. A total of 386 such locomotives were built, although only 40 of them still exist today in Romania. Most of them were scrapped, though some of them were sold to foreign companies. Most L45H locomotives can be found at Atelierele CFI Crișcior (The Crișcior CFI works), CFF Viseu and a few industrial companies, such as the Fieni cement factory, The Lonea Mine and the Govora soda factory.



**Fig. 25.** L45H 072, preserved in The Crișcior CFI works  
Photo: Matei-Ștefan Lutz, 2022



**Fig. 26.** L45H 87 0052, stabled in the narrow gauge depot from Cieh Soda Govora  
Photo: Matei-Ștefan Lutz, 2022

**Table 2.** L45H locomotives identified in Romania

Status	Location	Series
Conserved	The Crișcior CFI works	87 0004-9, 87 0009-8, 87 0013-0, 87 0020-5, 87 0023-9, 87 0038-7, L45H 072, L45H 076, L45H 091, L45H 095
	Cieh Sodă Govora	87 0050-7, 87 0051-5
	Lonea Mining	L45H 035, L45H 039, L45H 073, L45H 085
Working	CFF Vișeu	87 0015-5, 87 0032-0, 87 0033-8, 87 0036-1
	Cieh Sodă Govora	87 0044-5, 87 0052-3, 87 0053-1, 87 0054-9, 87 0055-6
	Cement Factory Fieni	L45H 033, L45H 034, L45H 038, L45H 055, L45H 099, L45H 094
	Steam train Sovata - Câmpu Cetății	L45H 078
	Lonea Mining	L45H 086, L45H 090
Under reparations	CFF Vișeu	87 0017-1, 87 0040-3, 87 0041-1, 87 0047-8
	Remarul 16 Februarie	L45H 079

Source: Field documentation, 2017-2022

FAUR București also built a narrow gauge version of their LDH18 locomotive, the L18H. 10 of them were built but sadly only 2 still exist today, in Vișeu.

*e) Diesel electric locomotives built by FAUR București*

Because of its very tight corners, the historic Oravița-Anina railway uses a special type of locomotives built by FAUR București - DEL125. 152 such locomotives were built by FAUR București, with around 70 or 80 still in use today. The local authorities are trying to get them into the UNESCO Heritage.

The DEL125s were not only built for the Oravita-Anina railway. They were also designed for rail freight shunting, and exist in the locomotive fleet of various railway operators in the country. For example, Complexul Energetic Oltenia has two such locomotives, 69 0050 and 69 0082, used for coal trains in Dragotesti, Gorj county (Fig. 27). The LDE125 locomotives were not built just for the Oravița - Anina railway. They are also meant to be used for shunting activities across the country, with many railway operators owning a few of them. For instance, Complexul Energetic Oltenia has two such locomotives, 69-0050 and 69-0082, used for coal trains in Dragotesti, Gorj country (Fig. 27). Vest Trans Rail 69-1159 locomotive, purchased from RAFO Onești has a very unusual running number.

FAUR Bucuresti also built the LDE130 locomotive, with 1300HP and a different look. 185 such locomotives were built, although only 33 for Romanian operators, the rest for export in foreign countries. Only four such locomotives exist today, LDE130 023 and LDE 130 032 of CET Iasi, LDE130 031 of Grup Feroviar Roman and LDE130 69-0602-3 of Unicom Tranzit. None of them are in use today.

With even more horsepower, the LDE150 locomotive is even harder to find. Also a FAUR București production, 43 of them were ever built, with only four in existence, LDE150 003 of Electroputere VFU Pașcani, LDE150 005 of CET Oradea, LDE150 009 of Astra Rail Arad and LDE150 015 of Euroest Constanța. Sadly, none of them are functional.



**Fig. 27.** LDE125 69 0082 of Complexului Energetic Oltenia with a freight train  
Photo: Matei-Ștefan Lutz, 2022



**Fig. 28.** LDE150 015, conserved inside Euroest România  
Photo: Matei-Ștefan Lutz, 2022

#### 4.1.3. Electric locomotives

Built by Electroputere Craiova, the 5100KW electric locomotives, also known as 060-EA are the most widely used electric locomotives in Romania. 060-EA-001, the first such locomotive, which would have been a very important piece of railway heritage, sadly no longer exists, after being destroyed in a tragic accident in 1990. The reasonless modernization of some 060-EA locomotives can also harm Romania's railway heritage. An infamous example would be 060-EA-005, the fifth such locomotive, built in 1966, which still had most original



components inside was completely modernized by RELOC Craiova, with the only original part remaining behind the actual external structure itself (Fig. 29).

931 060-EAs were built for CFR, but a lot of them were also built for export in countries such as Bulgaria, Serbia and Montenegro, with well over 1000 locomotives being built overall. Just like the 060-DAs, a lot of them were purchased by Romanian private operators, and brought back into the country under new numbers, though there are still plenty 060-EAs being used outside the country's borders.



**Fig. 29.** EA 41 0005-9, modernized by Reloc Craiova  
Photo: Matei-Ștefan Lutz, 2022



**Fig. 30.** 040 EC 001, stabled inside the Dej Triaj depot  
Photo: Matei-Ștefan Lutz, 2021

As previously mentioned, these unwanted modernizations are harmful because they destroy perfectly good pieces of heritage. For comparison, other countries keep the "retro" versions of their old locomotives and use them for tourist trains. Another instance of Romania's railway heritage being harmed is the 040-EC-001 locomotives, which is kept in the Dej Triaj depot and is degrading day by day (Fig. 30).

The 040-EC 3400KW locomotives were built in Yugoslavia by Rade Koncar Zagreb, with 130 of them being imported into Romania for CFR between 1972 and 1984. Of those 130 original locomotives, only 50 still exist, for both CFR and the private operators. As before, private operators also purchased 040-ECs from foreign operators and re-registered them in Romania, with their running number up to 167.

#### 4.1.4. New locomotives built in Romania

After 1990, much fewer locomotives had been built in Romania:

- **The Phoenix locomotives**, built by Softronic Craiova. They have been registered as class 473 and 478 and have 5100KW, just like the old 060-EAs. Four such locomotives have been built so far;
- **Transmontana locomotives**, also known as LEMA, were built by Softronic Craiova and have 6000KW, Thus far, 66 such locomotives

were built, for Romania but also for Hungary and Sweden, but the number keeps growing. The Romanian national operators only own one such locomotive, LEMA 001 of CFR Calatori, which happens to be the very first such locomotive, with the rest being owned by private operators such as DB Cargo Romania, PSP Cargo, CER Fersped, Vest Trans Rail, United Railways and Cargo Trans Vagon.



**Fig. 31.** Phoenix 473 003-8, with the train IR1752 from Suceava to Bucharest  
Photo: Matei-Ștefan Lutz, 2022



**Fig. 32.** LEMA 001, with the train IR1657 from Bucharest to Bacau passing Chitila Sursa: Matei-Ștefan Lutz, 2020

- **Narrow gauge diesel locomotives**, built by the Criscior narrow gauge works in 2021, known as L12H, will be used for tourist trains on the Cornatel - Hosman route.

Apart from new locomotives being built, the last few years saw a few drastic modernizations of existing locomotives. Euroest Constanța created a hybrid locomotive, based on the LDH1250CP chassis (Fig. 33). This locomotive can reach speeds of up to 30kph, has a battery life of 12 hours and can be fully charged in 3 hours (Dobrescu, 2018). This locomotive belongs to Trade Trans Curtici. In the meantime, RELOC Craiova built an electric locomotive on batteries, similar to electric cars, also based on the LDH1250 chassis (Fig. 34), with two locomotives built so far. They heavily reduce fuel usage, are very silent and reliable.



**Fig. 33.**Hybrid Locomotive 49 2001 shunting in Curtici  
Photo: Matei-Ștefan Lutz, 2022



**Fig. 34.** Battery electric locomotive 491 002, stabled in the Conpet Pecica station  
Photo: Matei-Ștefan Lutz, 2022





despite the fact that there are plenty of spectacular railroads abandoned by CFR (such as the Ciomeghi - Holod - Vașcău line).

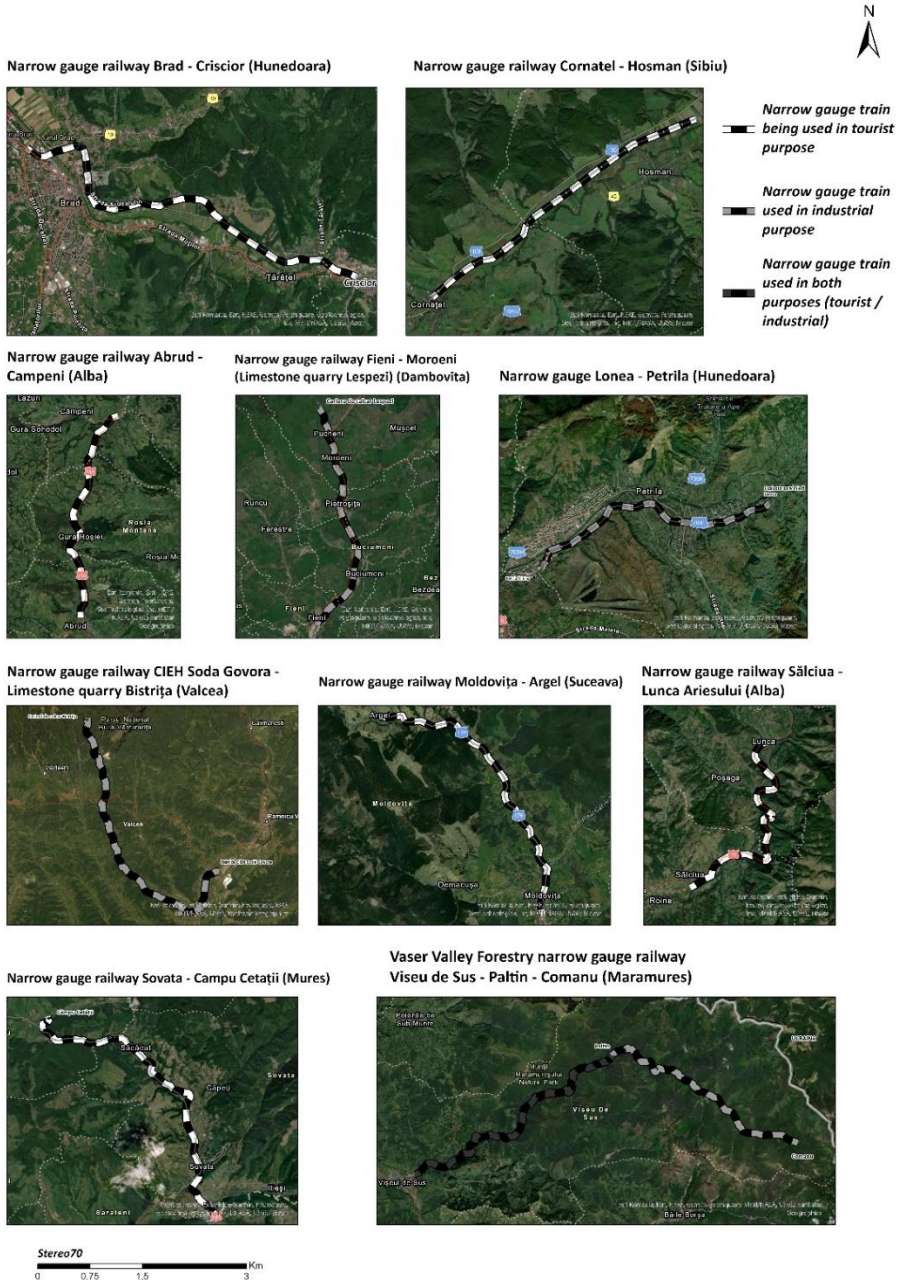


Fig. 36. Narrow gauge railways still in use in România

A good way of increasing profit would be to turn the railways that are considered "unprofitable" into tourist railways, such as Ciumeghiu - Holod - Vascau, Crasna - Huși, Alexandria - Turnu Măgurele, Floreni - Dornișoara and Vama - Moldovița.

## 5. Conclusions

The history of locomotives, quite possibly the most important railway heritage is evolving every day. Considering the number of locomotives that still exist in Romania and their uncertain future, they need to be used more. A lot of them have been modernized for no reasons, many locomotives are shown off in irrelevant places, others are conserved or abandoned. Still, there are some positive examples, such as Complexul Energetic Oltenia.

Since a lot of locomotives may disappear in the not too distant future, a good way of remembering them is by the way of photography (trainspotting) (Train Enthusiast, 2015).

Since the second half of the 20th century, railways have started to lose their popularity, after the industrial revolution, with the closing of coal mines. England has managed to induct buildings and railways into its heritage, especially after 2003 (Erkan, 2012). Conserving one's heritage is usually talked about when it is endangered and at risk of being destroyed. From this point of view, Romania has the opportunity of taking inspiration from other countries. An example would be the conservation of Turkey's Haydorpasa terminal (Erkan, 2012).

Another example, brought up by Lonsdale et al. (2013) and Burshtin (2013), regarding the United States railways is their uniqueness: from rack railways to the subway network of New York. Romania also had rack railways, and, although none of them are still in use today, they could be considered heritage by reactivating the 40-series steam locomotives.

The Czech Republic and Slovakia are conserving their railway heritage in different but great ways. After 1990, the Czech Republic privatized its museums and exhibitions. Slovakia has fewer temporary exhibitions, but it has more permanent pieces of railway heritage (Vasiliev, 2021). Similarly, Great Britain is also doing a good job of getting the most of its railway heritage (Crappier, 2014).

Romania enjoys a very complex railway heritage that is sadly very underutilized. It only has 4 museums that aren't even complete, while also lacking in terms of tourist railways.

This study is limited to photographing and noting various Romanian locomotives and their numbers, owned by both the state railways and private operators.

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