

The City on the Rails

By *Nikoleta Slováková* *

*The research focuses on the application of the elements of the theory of linear urbanism to the current solution for the rural settlements, from which life is lost and they are becoming open-air museums. Rural settlements are currently experiencing a crisis, most of their residents are moving to the big cities for work and in order to improve the quality of their life. This work is inspired by utopian cities from the early 20th century, such as *The Roadtown* by Edward Chambless, *Plan Obus* by Le Corbusier or *Green City* by Konstantin Melnikov. Similar tendencies as in previously mentioned works could be found in highly developed cities such as Tokyo. The book, “*Made in Tokyo*,” from Atelier Bow-Wow,¹ has already mapped the use of those utopian tendencies in Tokyo and tries to apply its forms to the existing typology of cities and landscapes. The aim is not to put all the functions in one conglomerate, but rather to create a superorganism within the country. The superorganism consists of several settlements with insufficient facilities. The settlements are interconnected by an already existing railway. The most important transformation is hidden in the utilisation of the transport infrastructure and in the further addition of the necessary facilities in such a way that the individual necessary facilities within the linear composition can be shared between multiple dwellings. The presented paper uses an artistic research approach, using the method “research by design”. It is an applied (practical) normative research, which relies on the theory of linearity and the theory of the garden city and their radical and coherent design concept. The starting point of the research is a critical look at the current methods of chaotic construction in protected landscape areas in Slovakia. It uses the Margecany-Červená Skala site as a case study to demonstrate how linear theory would work in the present day, using Geographic Information System (GIS) data to analyse the site. The main goal of the project is to bring back the attractiveness of the region with the usage of contemporary artistic concepts, technologies and strategies.*

Introduction

The restoration of the life in rural settlements is a complex subject, as is the revitalisation of the railway lines and the use of its potential. In addition to transportation-related challenges, the railway is also rising in the issues related to other areas ranging from regional economics, sociology, urban planning, architecture, ecology and technical heritage. Almost 200 years have passed since the creation of the first public railway, and since then the railway has managed to radically change the appearance of cities and landscapes. It has been an agent of change and enormous financial capital has been invested in it. The railway

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1. M. Kaijima, J. Kuroda, and Z. Tsukamoto, *Made in Tokyo* (Tokyo: Kajima Institute Publishing Co. Ltd, 2016).

inspired the ideas for the new towns and cities which were using these new modes of transport.

The first proposals emerged in the late 19th century. These were new designs for gardens and linear cities, and also new theories were developed regarding cities built into the landscape (garden cities). These were ideas that still, a century later, seem bold.

Today, the situation is different but the advantages of the railway remain—it is environmentally friendly, it has extensive infrastructure and it is safe. The railway has a potential which just needs to be harnessed properly because it is not just a mode of transport, its impact is greater. The railway is a city-forming element that gives the region it passes through character and a common identity. It is characterised by its line. We all move around, to work, to school or for recreation, creating real and abstract lines.

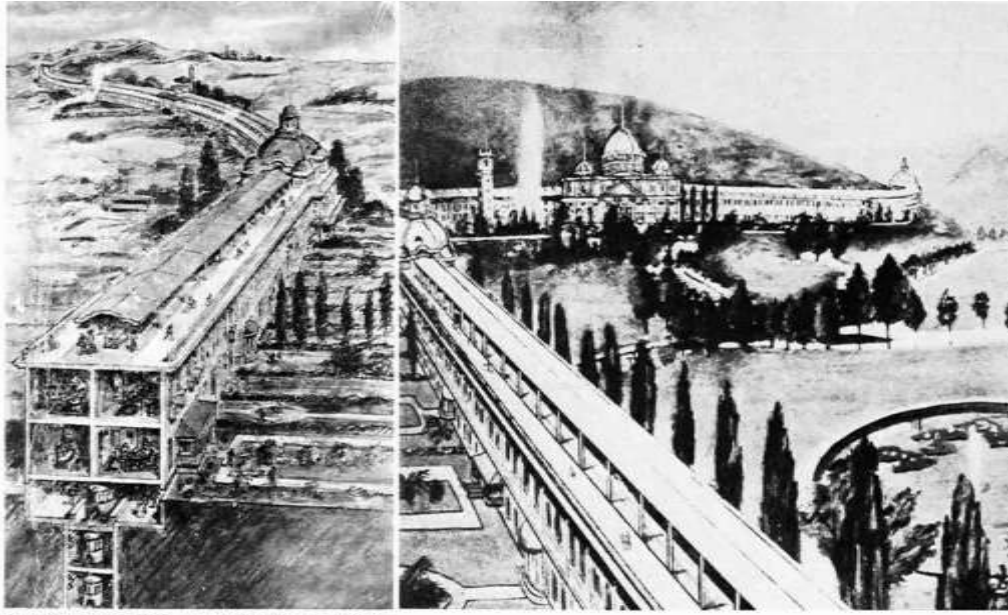
The aim of this project is to examine and show the potential of the railway, which lies in the qualities other than just transport. The project is focused on the revitalisation of the railway into a cultural/sociological institution, promoting the region and contributing to the quality of the environment in the area where it is located. The fundamental pillar of a good quality life is the creation of quality living places. This can be understood as the creation of quality housing, spaces for leisure and culture, spaces where people can engage in mutual interaction and be inspired together. It is important to offer the same quality spaces even for small settlements as ones that could be found in big cities.

Literature Review: The Theory of the Linear and Garden Cities and its Present-Day Shifts

In the following part, two fundamental approaches to the theory of the linear cities will be presented. These two major linear cities' projects from history have heavily influenced the research and they will be presented together with the architectural interventions made in Tokyo, which are mapped in the book, *Made in Tokyo*.

Roadtown - E. Chambless, 1910

Edgar Chambless was intrigued by the relationship between the means of transport and land already in the early 20th century. His radical vision was translated into an idea of creating a *residential transport corridor* – *the Roadtown*. The basic idea of his proposal was the decision to lay a modern skyscraper on its side and run the elevators, the pipes and the wires horizontally instead of vertically.



71. Roadtown 1910. Aerial View. Even the Splendid Isolation of Wealth May Take Advantage of the Roadtown Idea.

Figure 1. Roadtown – E. Chambless

Source: publication Unbuild America.

Thus the size of the houses was not limited by the bending of the steel structure (see Figure 1). In doing so, he found a way to combine transportation and housing into one mechanism. In modern life, then and now, connections are essential, whether the transport links to housing, to work and businesses or to leisure activities. The ideal solution is when all these functions are as close together as possible.

The biggest driving force for the Roadtown proposal was the need for the creation of housing for the farming community. Chambless, already at that time, tried to make the town as self-sufficient as possible. The idea of self-sufficiency was key for him and it is also something we are nowadays more and more often confronted with. The community of farmers were to work in the adjacent fields after they finished working in the town, and therefore supplied all the needs of the inhabitants.

Roadtown is a proposal that combines production, consumption, and transportation into one unit. The project envisioned a quiet monorail transportation connecting two-story apartment buildings. The design includes adjacent gardens and a promenade deck. Everything was to be constructed in mass concrete, using materials that would be modern and sourced locally. The Roadtown differs from the other linear city designs by being the city in the country. It sought to bring a new symbiosis between the city and the countryside. Roadtown was to be a linear city with a thousand people per mile surrounded by farmland. The fields are placed directly perpendicular to the railroad so people can move around the line easily.

Chambless believed that the best mode of transportation would be a monorail system. He was acquainted with Mr. Boyes, who was able to supply a monorail

car.² The transportation system would be housed in an underground deck, with stairways leading from it directly to the houses. The roof of the subterranean train transportation would serve as a walkway. In the centre, the walkway would be roofed with glass panels and during the winter possibly heated by a steam engine. There would also be space for the cyclists or skaters on the sides of the roof. Thus Roadtown would not have streets because it does not need them. It would be divided into several floors so that the houses could overlook their gardens. On the upper floors, more luxurious dwellings would be built, either for the visitors of the Roadtown or for high society.

At the time when the project was created the farm colonies looked simply as an unmaintained farmhouse in the middle of a large field with no connection to the utility grid system. This was also the time of electrification and the expanding need to get connected to the utility grid. Therefore each farmhouse would have to be connected, the wiring would have to be stretched, the farmers would have to get their own boiler, dynamo, etc. The economic benefits of the proposal are apparent—it would make the connection to the electricity and pipe system cheaper. The situation was better in the cities because people were located closer to each other and the electricity and pipe system were therefore not as costly.

From a technological point of view, Roadtown was exceptional in situating the whole technical infrastructure into the basement. Therefore it would be easy to carry out revisions and repairs without need to interrupt or limit the life of the inhabitants in the city.

The proposal was ground-breaking not only in the perfectly thought out concept of the residents' lives, but also by being thought out to the last detail. The project was addressing not only the matters regarding the heating and cooling system, but also such a details as the piping for soap for showering, considerations of a central vacuum cleaner, telephone and telegraph, and even the possibility to discharge a disinfectant gas for the specific housing units.³

Green City - Konstantin Melnikov, 1929

In 1929, Soviet authorities launched a competition to design a garden suburb outside of Moscow where workers could be sent to recover from the strain in the factories. The “green city” was to house 100,000 workers at a time and provide a range of recreational and cultural activities. Many Russian architects and planners who had long been concerned with the questions of how socialist communities could avoid the shortcomings of the capitalist metropolis—squalor, overcrowding, exploitation and alienation—seized the opportunity to project their ideal visions (see Figure 2).

2. M. Novak, *William H. Boyes Monorail (1911) High-Resolution Photo* (Abstracted: Novak Archive, 2020).

3. E. Chambless, *Roadtown* (Breinigsville: BiblioLife, LLC, 2010).



Figure 2. *Green City* – K. S. Melnikov

Source: publication Konstantin S. Melnikov and the Construction of Moscow.

Among the most remarkable of the proposed projects was Konstantin Melnikov's project. For his proposal of the circular city, he planned green spaces with forest, gardens and orchards, a zoo, a children's city and a public sector, with a train station combined with a concert hall, a "solar pavilion" for sunbathing and "bedrooms" located in dormitories, which were the building units for the workers' rest. For Melnikov, sleep was a healing resource, more important than food and air. Melnikov argued, "And now, when I hear that good health requires nutrition, I say - no - it requires SLEEP. Everyone says that recreation requires fresh air; wrong again - I believe that fresh air is unable to recharge our energy without sleep ... I suggest domes and chambers for 'victorious sleep'. Without sleep, fresh air will do little for our health."⁴ Based on this opinion, he devised a building in which hundreds of workers could enjoy the benefits of sleeping simultaneously. Called the "Sonata of Sleep," the building consisted of two large dormitories. On both sides of a central block it contained toilets with hydro-massage and the thermal regulation of heat and cold was provided by stone stoves.

Dormitories had sloped floors to eliminate the need for pillows, and beds

4. S. F. Starr, *Solo Architect in a Mass Society* (Princeton: Princeton University Press, 1978).

were to be built in like lab tables. Melnikov, who envisioned control over the entire sensory experience of sleep and atmosphere, played an important role in orchestrating the sleeping experience. Control booths were to be placed at the both ends of the long buildings. Inside of them, technicians operated devices regulating the temperature, humidity, and air pressure, as well as controlled wholesome scents and “diluted condensed air” that wafted through the halls. He also wanted to introduce sound regulation by means of the rustling of leaves, the noise of the wind, the sound of watercourses, and similar sounds of nature, including storms. These sounds would be heard by placing special sound horns at opposite ends of the dormitories. Symphonies and readings would also be reproduced. Melnikov planned to replace the annoying “pure noise” (showers, washbasins, neighbours, conversations, snoring...) with “organised sound” based on musical principles. Specialists would broadcast from a control centre a series of sounds to intensify the sleep process “based on the scientific facts”. All of these sounds would instantly relax even the most overworked worker from the metropolis. If these failed, the mechanized beds would then begin to rock gently until consciousness was lost.

Gardens, playgrounds, forest, zoo, recreation hall, tourist pavilions, mobile restaurants and cafes, libraries, and sports equipment distribution points were all within the reach of the highways and railway. The Institute of Man, the place where the residents live, was located right in the middle. The twelve buildings of the sleep laboratory, which were to house 4,000 people at a time, were placed in a circle in the woods. The professional community began discussing the construction of such centres across the country, but by 1931 the project was shut down because of the debates over city planning and the persecution of the avant-garde had begun.⁵

Melnikov’s ideas were too extreme for the 1920’s, but were of great significance and seem progressive even in 2021.

This project was so unusual and confusing for the audience of his time that it was never executed. Six years later, Melnikov, or “the stuntman”, “the magician” and “the formalist”, as the Soviet mass media called him at the time, was dismissed from his position as head of the architectural and design workshop “City Council” and stripped of any further commissions. Everything he designed for the rest of his life accumulated only in his desk drawer. Although he managed to survive the Stalinist purges, he was never rehabilitated.

Melnikov had read about an experiment at the US Naval Aviation School in Pensacola, Florida, where cadets learned languages while they slept. This was probably the starting point in development of his own theory. It was also in the US that his ideas were first put into practice, although none of the Green City schemes ever became reality.

Melnikov’s ideas attracted the attention of Samuel “Roxy” Rothafel, the famous New York showman and businessman, who visited Russia in 1931. Rothafel was gathering the ideas for the Radio City Music Hall that he and John D. Rockefeller proposed to build.

5. M. Fosso, O Máčel, and M. Mariggi, *Konstantin S. Melnikov and the Construction of Moscow* (Milan: Skira, 2001).

Apparently, the control booths regulating the sounds was just the idea he liked: “During several months, Rothafel’s advertising department was bombarding the American public with Melnikov’s claim that ‘two hours in the washed, ionized, ozonized, and ultralarized air of (Radio City Music Hall) is worth a month in the countryside’.” While Rothafel’s enthusiasm grew out of a desire to manipulate consumers, he was the only one who followed Melnikov’s theory.⁶

Current Tendencies - Tokyo and Osaka

The following section offers the summary of some of the tendencies in Asian architecture and the formation of a new set of typology that has developed from the idea of the use of the transport infrastructure.

In many Asian countries, land in cities is very valuable. Therefore there is a tendency to use, develop and densify the city as much as possible, thus creating new hybrid spaces using the particular location and the connection to the transportation infrastructure.

The research which mapped these hybrid projects in the city of Tokyo was carried out by Atelier Bow–Wow. For example, in one case the empty railway bridge infills are combined with the commercial arcades that are 300m long. Each arcade has 3 floors and a small forecourt. Another interesting example of the project is the combination of an office building with corporate housing and a secure car park connected directly to the city’s expressway in Roppongi, Minato area.

Another appropriate use of the residual land that arises in the areas of intersections or radii of street curves is the design in Nishikahei, Adachi. It combines retail, office, parking and sports (see Figure 3).

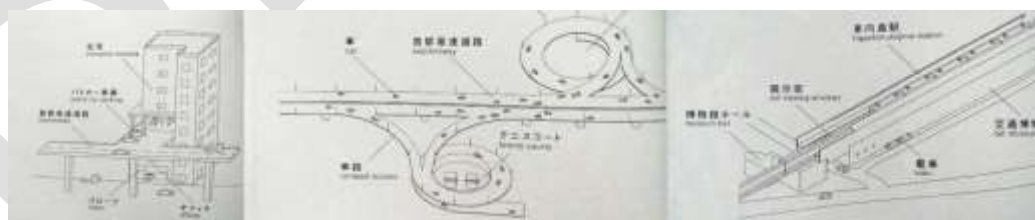


Figure 3. Tokyo Tendencies

Source: publication Made in Tokyo.

In Higashimukojima, Sumida-ku we can find the combination of the rail corridor with the Higashimukojima Railway Museum. The linear nature of the structure directly suggested its function as a railway museum, where visitors of the museum are automatically part of the existing transport infrastructure.⁷

With all the interventions, in Tokyo they are able to make efficient use of each parcel of land and add to the lost value eroded by the need for massive infrastructure.

6. R. Melnick, *American Showman: Saumel “Roxy” Rothafel and the Birth of the Entertainment Industry 1908-1935* (Columbia University Press, 2012).

7. Kaijima, Kuroda, and Tsukamoto, *Made in Tokyo*, 2016.

The vision of the linear city was eventually constructed on a similar scale in the Osaka Loop-line project, in the form of a city under the railway corridor. By combining the railway with other functions, an area of 19,000m² was valorised in Osaka with a stretch length of 1km.⁸ Similar projects are also appearing in Europe, such as the viaduct project in Zurich by EM2N architects, which addresses the question of how an infrastructure element that is a protected monument can be made a part of the urban system. They describe the viaduct as more than just a bridge.⁹

Selected Location: Margecany - Červená Skala Railway

The reasons for selecting this particular locality as a case study for the paper are that there is an un-renovated railway line in the locality, and it is located in a neglected region of Slovakia with great potential.

The building of railways was a great milestone in the development of entire regions. This was the case also with the Margecany – Červená Skala railway line, built in the 1930's. This is a railway line of local importance connecting the villages of Červená Skala and Margecany and thus the centre and east of Slovakia. It is considered as one of the most beautiful lines in Slovakia running through the natural gems Muráň Plain, Slovak Paradise or Hnilec valley. There are as many as 281 bridge structures, 9 tunnels (originally 12 - before the project was modified) with a total length of 3,801m. There are 12 stops and a number of guard posts. The Telgárt Loop located on the line is one of the 69 spiral tunnels in the world and the only one in Slovakia.¹⁰

This new railway is not a usual construction. It was not built easily, but laboriously, for it runs through the mountainous terrain. A great deal of construction work has been devoted to its construction because the railway has wider tasks than being just another part of the Czechoslovak Railsystem. It has a great economic, social and cultural mission, which it will hopefully fulfil.¹¹

The only railway line connecting Slovakia with the Ostrava region (Czech Republic) was the Košice-Bohumín railway. The Czechoslovak Railway Company extended the railway and created a Central Slovak transversal line. Margecany – Červená Skala line is a continuation of the line from Banská Bystrica to Brezno that continues up to Červená Skala. The line was also significant economically. It brought a new life to the region and trade and tourism began to develop. Not only were new settlements in the form of villages created, but also the water reservoirs, warehouses and accommodation for railway staff were built along the line. Even the watercourses in the region had been regulated due to the railway construction. On its line there is also a unique cave structure - Dobšiná Ice Cave.

8. P. Hájek, *Kombinace Funkcí v Architecture* (Prague: Czech Technical University, 2010).

9. R. Frei, *Refurbishment Viaduct Arches / EM2N* (ArchDaily, 13 May 2015).

10. Ministerstvo Železnic, *Pamětní spis o Stavbě, Červená Skala- Margecany* (Slovakia: Ministerstvo Železnic, 1936).

11. Vo Vlaku, *Historická Jazda Pripomenie 80. Výročie Trate Margecany-Červená Skala* (Bratislava: Tlačová Agentúra Slovenskej Republiky, 2016).

Preparations for the construction of this line began even before the fall of Austria-Hungary. In 1920 geological research of the area was carried out under the supervision of Dr. R. Kettner, a professor at the Czech Technical University in Prague. At that time there were already private narrow-gauge railway lines belonging to the concessionaires Gertle M. and Comp., Peter Matuška, Adolf Reich and Ján Aradi. In the preparatory phase of the construction they were nationalised. Among these existing railways was also a technological gem, the first cog railway in Hungary, which connected the mining settlement of Mária Huta with the village of Žakarovce.

In 1931 construction work began on the most difficult section of the construction near Telgárt town. The workers worked under the unsatisfactory financial conditions which resulted into a series of strikes. The difficult working conditions were reminiscent of those from the 19th century, when the first railways were built. One worker, a 26-year-old J. Chlapovic, was even shot dead, when the strike was being suppressed.

In 1933, the first section of the Červená Skala – Telgárt line was opened, followed by other parts in the following years. On July 26, 1936, the entire line was inaugurated in the presence of the politician Juraj Slávik; Minister of Railways Dr. Rudolf Bechyně; Minister of Justice Dr. Dérer and representatives of the highest state; provincial and railway authorities; corporations' representatives and deputies and senators.

At the time, unemployed railway workers of the Košice – Bohumín Railway Company, together with the unemployed youth, worked on the railway. There were about 7,000 workers, and during the period of the greatest intensity of work, up to 9,700 workers, men and women, were participating on building of the railroad. Of these, about 59% were local.

As on most of the Slovak railways, the Second World War and the Slovak National Uprising caused great damage to this line. Altogether, 29 bridges or viaducts and all the tunnels were destroyed during the war. It took almost half a year to repair them, even if all possible working forces from the surrounding villages were engaged in restoration works.

The track is perfectly set in the surrounding countryside and the beauty of the Slovak landscape could be seen in a juxtaposition with a large number of technical works - bridges, tunnels and viaducts. Along the line, there were also stops with the station buildings, but unfortunately they are either dilapidated or have disappeared. Today, the railway is mainly used by tourists, with only two regional trains and a few passenger trains a day, mainly in the morning and evening. To this day, however, they still stop at almost all stations.¹²

12. M. Potančok, *Telgártskou Slučkou do Raja* (Margecany: Martin Potančok, 2017).

Building in the Protected Landscape Area

Nature conservation has a rich tradition in Slovakia. The first legal frameworks for the existence of protected areas date back to the period of feudal land ownership. The protection was based on the laws protecting the forests and game (13th-15th centuries), mineral springs (Royal Patent of 1682 and 1715) and, in particular, on the Theresian Forest Order of 1769. The motives for establishing protected areas were originally due to ownership reasons and later for romantic and local-patriotic aspirations. Gradually they expanded to include scientific, cultural, patriotic, aesthetic and recreational purposes.

In the late 19th and early 20th century, thanks to awareness-raising efforts and activities of scientists and various associations, nature protection was gradually secured at the legal level. During this time the first areas with the status of nature reserves or natural monuments were created (the oldest reserves are Ponická dúbava and Príboj, established in 1895). The first systematic categorisation of the protected areas in the Hungarian kingdom, where at the time Slovakia also belonged, was presented by Karol Kaán in his work, "Preservation of Natural Monuments" in 1909. However, the real development of nature conservation began only after the establishment of Czechoslovakia, when the foundations were laid for today's set of protected areas. The period from the very beginnings of nature protection and the establishment of the first protected areas until the interwar period, or eventually until 1955, is referred to as the "conservation period". The main goal was passive, conservational protection, which aimed to preserve individual species. This period included the conservation of predominantly small-area landmarks and rare natural creations and phenomena.¹³ Currently in Slovakia, several inappropriate building activities are taking place, which are not respecting the protected-area status of the landscape they are in. As an example, the construction at Štrbské Pleso lake area in the Tatra Mountains could be mentioned. The locality was developed in pursuit of promoting tourism and making the place attractive with poor-quality tourist attractions.

Results: Proposal for Revitalisation of the Line – New Linear City Margecany - Červená Skala

In this project the thoroughfare is considered as the basic linear element—the backbone around which the new city is composed. For the railway, as a transport infrastructure, the landscape is to a large extent adapted. In the case of the railway, linear shape is key. It is important that the line of the railway is disturbed as little as possible and maintains a smooth passage through the landscape. It forms an imaginary boundary; the line can be understood abstractly or mathematically. Parts of the line are three-dimensional like all of our space, but with the railway line we also cannot forget the fourth dimension, which is time. Time is the only non-renewable raw material of our existence. This is why the project completes the

13. M. Škodová and J. Mazurek, *Chránené Územia Slovenska* (Banská Bystrica, Slovakia: Fakulta Prírodných, Univerzita Mateja Bela, 2011).

railway with the modifications that would not block the smooth movement of the train sets along the “spine” and therefore save time.

The research is devoted to the application of the elements of the theory of linear urbanism to the current design of the site Margecany – Červená Skala, which is losing its life and becoming only an open-air tourist museum. Rural settlements in general are experiencing a crisis as life is disappearing from them. Most of the population is moving to the big cities in search of work and better life standards.

The aim of the proposal is not to fit all the public amenities into one conglomerate, but rather to create a super-organism within the countryside. The super-organism will be composed of several settlements with are currently insufficient as public amenities. Settlements are connected by the already existing railway. The most important modification is in the use of the transport infrastructure and in the addition of the necessary public amenities. The amenities would be located on the linear transport infrastructure and it will be possible to move them along the railway line. Therefore, it would be possible to share them between the dwellings. That means that the proposal makes the most of what the area already contains and complements what it lacks (see Figure 4).



Figure 4. *The City on the Rails, Margecany - Červená skala - Analysis*
Source: Nikoleta Slováková.

The Margecany – Červená Skala line is interesting also because of the extensive transformations of the local landscape since it is crossing a mountainous area. By looking closely, significant changes in the topography of the landscape are visible.

The statistics illustrate the impact in numbers. A total of 3,030,000m³ of rocks were moved during the excavation works. To build all the bridges, walls and other artificial structures, 110-thousand cubic meters of masonry were consumed in the open track, and another 68-thousand in the tunnels.

In the following part, the structures that were built for the railway and modified the local landscape will be described. An embankment is a formation that is added to the topography where necessary to support the railway. Some embankments are smaller and inconspicuous, but some create mounds between the individual parts of the village. The tunnel creates one of the most prominent encroachments. On the line with a total length of 3,801m, there are nine of them. Also, road crossings occur frequently on the line, many times involving several types of road material. Waterways, car roads, footpaths and railway lines cross here.

Bridges connecting many sections of the railway are to be found as many as

281 times along the line. The train passes through an interesting section through the Mlinky dam, which was built only after the railway was already built. Therefore the line's relocation was necessary in this section. Here the train passes through the middle of the dam, which flows up a narrow canyon. In this case it is difficult to determine how the terrain looked originally. The most interesting part of the railway is the Spiral Tunnel. It is the only such structure in Slovakia that is 2.3 km long and overcomes a 31m height difference.

The non-electrified line which is 92,578 km long, has 26 functional stops (Červená Skala, Telgárt pension, Stratená, Dedinky, Mlynky, Mlynky stop, Rakovec, Sykavka, Hnilec, Nálepko-Peklisko, Tretí Hámor, Nálepko (formerly Vondrišiel), Stará Voda, Švedlár, Švedlár stop, Mníšek nad Hnilcom, Helcmanovce, Prakovce, Prakovce stop, Gelnica stop, Gelnica town, Gelnica, Žakarovce, Jaklovce, Margecany) and some non-functional (e.g., Telgárt station and Vernar station).

The project proposes to repair and supplement the linear network with new stops, which would become stations not only for people, but also for mobile train sets. In these mobile train sets new (currently missing) amenities will be embedded. The train sets can move along the existing railway the only thing that will be added to it will be the new train switches for shunting the trains.

In the new stations, apart from the waiting area for passengers, there will be a dedicated area for car servicing, electricity, water connection and cleaning area. Their architecture will be simple, with the check-in section in front and the technical section in the rear, connected by a rear wall to allow the space to be enlarged. Basically, the structure of the station can be seen as a hybrid between a hangar for the train and a classic waiting station. The new train sets with amenities will move primarily during the day, possibly at dedicated time intervals, so as not to block the path of the passenger trains. Renewed existing stops located on the line must be retained for their cultural value. They will only be supplemented by a train siding and rear hangar, or by new stops where existing stops are no longer adequate. These new stops will be of a simple steel construction to fit in with the unified character of the railway buildings. They will have a modern appearance so that the period of their construction is apparent.

An empirical data analysis (GIS) of the public amenities of the Hnilec Valley revealed a lack of educational facilities in the locality, lack of leisure possibilities for children and young people, lack of medical facilities in some of the villages and lack of complementary education and cultural opportunities.

Therefore, the project proposes to place these functional amenities on the new train sets that will always travel from stop to stop at certain daily set rhythms, so that the localities will come to life. These are, for example, a doctor's surgery, a veterinarian, a library, a small nursery or kindergarten, an art gallery, an exterior space of a convertible train set in for exhibitions, cafés or refreshment places, community clubs for mothers and the elderly, music studios, sleeping shelters, or schools in the open air, located in a carriage set, whose landing point is always the train stop (see Figure 5).

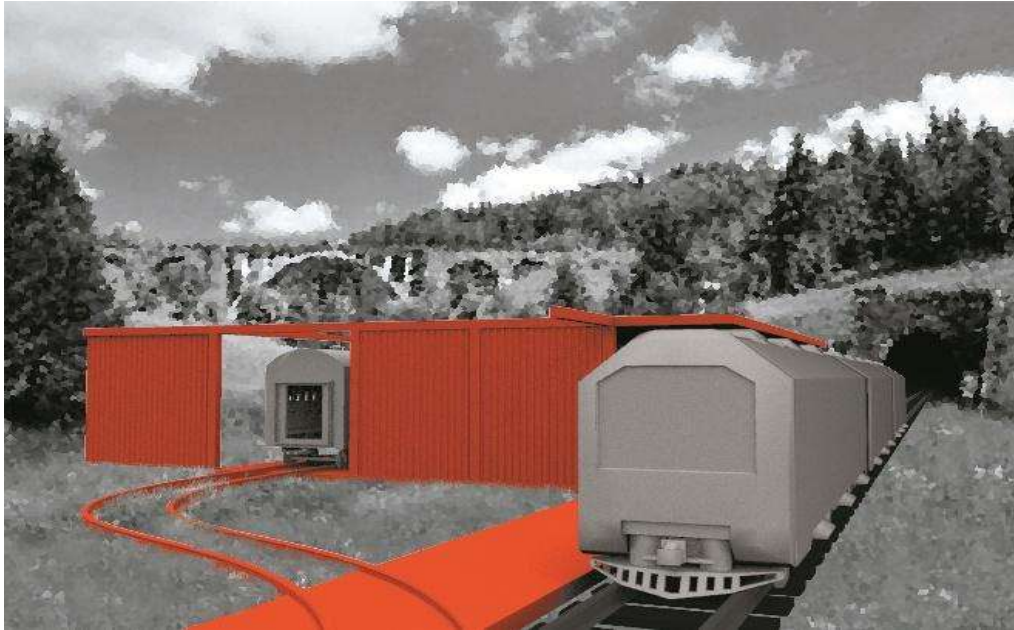


Figure 5. *The City on the Rails, Margecany - Červená Skala - Project*
 Source: Nikoleta Slováková.

Discussion: Criticism of the Linear Cities Plans

Because the surface of the earth is three-dimensional, the creation and functionality of a linear city is impossible. As long as we have forces in all directions of the Earth's surface, we cannot have linear cities.¹⁴ Despite the great interest of architects in the concept of linear cities, none of the examples of the designs have ever materialised. The first contributions to the discussion regarding the linear urbanism came from Ch. Bouilhet in 1912, who feared that the idea would mean “the disappearance of city as the nucleus of a human activity.”¹⁵

Organically created linear cities emerge and develop quite differently from the planned projects. The definition of a linear city itself (linear composition of buildings with a thoroughfare running through the middle) is not sufficient, which may also cause misunderstandings.¹⁶

Why did the linear city concept actually fail? One of the possible answers to this question could be an insufficient definition of the linear city.

The linear city plans are about finding alternative housing and breaking down old boundaries. Humans feel insecure in an unbounded and undefined territory and the linear cities extend into an uncertain space of nature. But is it necessary to have fixed boundaries? Would it not be enough to understand the line itself as a border?

Another possibility why the proposals of linear cities have never been materialised is that the idea was specific to the turn of the 19th and 20th centuries

14. C. A. Doxiadis, “On Linear Cities,” *The Town Planning Review* 38, no. 1 (1967).

15. E. Stachura and T. Tufek-Memisevic, *A Linear City Development Under Contemporary Determinants* (Sarajevo: University of Sarajevo, 2015).

16. J. Hruza, *Teorie Města* (Prague: Nakladatelství Československé Akademie Věd, 1965).

and loses its meaning as time passes. However, many of the problems that the concept of the linear cities addressed are still relevant today such as the rural-urban divide that is widening, or the devastation of the nature by human activities.

Despite the diversity of the projects, there are some common features between them. Almost all of the concepts were developed in response to the poor social and sanitary conditions. The first projects responded to the poor living conditions during the industrial revolution. Today they respond to the demographic crisis.

All the linear-city projects are *alternatives to the central city*. They are using the concept of polycentricity or try to rethink housing that will not be centred around one particular place (city centre).

The projects deal with how innovations in transportation affect the urban fabric and what possibilities speed opens. They are characteristically concerned with the relationship between *landscape and city, transport and housing*. While we have already been rethinking these relationships for a century, the first ideas of linear cities seem radically utopian even today. It is a feature that almost all the projects have in common.

Despite being visionary projects, many of them are very detailed. Often their transport or financial lifespan is calculated.

Projects of the 1920's, such as Roadtown, envisioned endless expansion. They rethought housing itself and offered an alternative that could replace all existing housing options and spread across the country. Later projects, such as those in *Made in Tokyo*, deal with transportation infrastructure as a permanent feature and view housing as fluid and temporary.

The project is questioning not only the definition of a linear city but also the definition of a "city" itself. A city is a settlement or grouping of settlements that differs from the rural communities in the concentration of productive and non-productive activities, building heights, population density, availability of facilities (schools, theatres, libraries, medical facilities, etc.) and social relations.¹⁷ But why can't a line be a city nowadays? It can.

Conclusion

The work combines the theory of the linear city and the garden city for its conceptual coherence and radicalism. The research seeks to learn from their positives and negatives and apply them to the presented project, where it proposes a simplified concept in a similar system.

Through GIS analysis, the project has assessed future potential, explored design options through literature review and draws on their theory. By applying these methods, the presented project suggests ways to bring the site back to life.

With these simple principles of railway revitalisation, the individual communities around the line, or even beyond it, could be revitalised and unified. This is because linear cities have no end point, but can develop infinitely. The project aims to help to make the locations attractive again and bring the people of the valley high quality amenities for their region. These are minimal developments

17. Ibid.

with a big impact. With no disruption to the landscape and with a humble approach, modifications could not only contribute to the settler's life quality, but also to the promotion of tourism. Changes could create opportunities for young people to get involved, for communities of senior citizens, to bring the prospect of new jobs, and the railway itself could become an inspiration for future generations that support a culture and the arts in the region.

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