# The main issues of underground urbanism, in the example of Tbilisi Metro

Tatia Ghvineria Art historian/Cultural heritage expert

## About underground urbanism at large

The accelerated pace of present-day cities, population growth, expansion of territories, as well as the rapid development of social, scientific, and technological innovations, raises new demands for any city; Existing or recently emerged specific tasks appear urgent on the agenda. Especially in active new development conditions, a strict economy on increasingly scarce urban land is necessary. Instantaneous accessibility, lack of time, matters of safe travel, and easy and quick connection to the city center and suburbs have become one of the main challenges of contemporary cities. Alongside these issues, appropriate protection and preservation of the historical parts of the cities, and their accurate and delicate reconstruction is immensely important; Not only the technical-functional improvement of the residents' environment but also the fabrication and preservation of the artistic-aesthetic face of each public building. These are the main tasks that were formed in the wake of the main urban challenges of modern cities and also laid the grounds for the development of underground urbanism.

As early as the 15th century, Leonardo da Vinci created sketches for the "ideal city". In these sketches, he pays particular attention to urban planning and the main tasks of city development. The plan assigns specific streets for the population and transport and places them at different levels. Centuries prior, the issues raised by Leonardo for proper urbanism became the basis for the development of modern cities in the late 19th century and the 20th century (Fig. 1.). At the beginning of the 20th century, progressive-minded urbanists and architects accounted for the essentiality of development of underground urbanism for an organized system of transport and pedestrian traffic. For example, in the 1900s, the French engineer-architect Eugène Henard, in the plan *Street of the Future*, proposed different levels of roads for transport and pedestrians.[1]

Simultaneously, his plan intended the use of underground spaces for the technical equipment of buildings and parking, as he believed that the rapid growth of vehicle transport would certainly put such demands on the modern city and indeed, the development of large cities, technological innovations, self-evidently demonstrated the need for the development of underground urbanism. Newspaper articles, cartoons, feuilletons, and caricatures of the large cities of the 19th and early 20th centuries reflect this very topic.

[1] https://www.onverticality.com/blog/past-cities-of-the-future

The mentioned issue absolutely became the subject of interest of futurist research, namely the Italian architect A. Sant'Elia's project of a futuristic city [*Città Nuova*], which offered a fairly commodious high-rise development to the public, the lower spaces of which were divided according to zoning for different types of transport and pedestrians.

The author believed that the apt utilization of underground spaces was the way to develop a modern city. However, it is noteworthy that his idea set out to implement underground and above-ground volumes of buildings in a single architectural concept. Similar progressive ideas give prominence to German and Austrian architects Ludwig Hilberseimer and Richard Neutra[2]. In their project drawn up for Berlin, a firm differentiation between road sections can be seen. On the fourth and fifth floor levels of buildings special streets for pedestrians were designed, and only underground spaces were intended for different types of transport (Fig. 3.4).

Le Corbusier talks about the practical possibility of utilizing underground spaces in the 1920s and 1930s. He was the first to prove the exigency for clear functional differentiation for the modern-day city, both per the plan and the cross-section of the city (Fig. 5). In his project *Radiant City*, the author proposes five levels of transit.[3]

It is utterly clear that such, at that time, completely modern, innovative, and to an extent unimaginable projects, patently considered underground urbanism and corresponding spaces as requisite conditions for the development of a contemporary city, and also found additional functional public spaces for the various needs of the population and the city.

Since the beginning of the 20th century, the need for underground urbanism has become even further pronounced and manifested in the general plans of various large cities. The complex and diverse potential functions of underground space are apparent (Austria, England, the United States of America, Sweden, Switzerland, Japan, Canada, and others). Underground engineering urbanism, its problems, and relevant issues were touched upon in a special periodical publication "le monde souterrain" (1936) (Fig. 6,7).

At the 1937 Paris International Exposition, the Alps' Tunnel and Moscow Metro projects were highly praised. Hereby, the need to establish an international congress arose, which was held in 1937, 1948, 1949, 1964, 1965, and 1970 in various cities of the world (Paris, Rotterdam, Brussels, New York, Warsaw). The chief motto of the congresses was such - *there is no urbanism without underground urbanism* (Fig. 8).

Underground urbanism does not only refer to underground transport - it also includes the listed functional group:

1. Engineering-transport function - metro stations, underground passages, railway stations, and others;

[2] https://www.famous-architects.org/richard-neutra/

[3] https://architectuul.com/architecture/radiant-city

2. Trade and catering - shopping centers, cafes, restaurants, and other establishments united in complexes;

3. Entertainment, administrative, and sports facilities - movie theaters, exhibition halls, dance floors, archive, game centers, and others;

4. Communal-everyday facilities - swimming pools, atelier, tailor shop, salon, post office, and others;

5. Household appurtenant structures - storage of products and others;

## History of Metro

The list given above differentiates between active public spaces and auxiliary, subordinate facilities, although in both cases the focus is on entire underground complexes, the use and functional purpose of which are vital to the city. Several European cities (Paris, London, Stockholm, Berlin, New York, Brussels, among others) are planning to employ such a system.

However, one of the earliest and most common functions of underground urbanism is indeed transportation, which was conceived alongside the development of cities.

For European cities, the development of underground transport served as the main incentive for developing underground urbanism. In this regard, London was a pioneer (Fig. 9, 10). The construction of the London tube was carried out by the Metropolitan Company (MET), thus this name was given to the entire system of underground transport. In London, the streets connected to the underground space via stairs, where the platforms were located. Initially, locomotives were used in the London Underground. The steam engine would get started at a stop and continue to run, however, in the 1880s, the steam engine was replaced by the electric car. The London development scheme comprised 20 to 60 underground stations. Initially, special cabins - elevators were used to transport passengers, but in 1911, a system of escalators was put into practice. The first escalator was operated in 1911, also in London at Earl's Court station.

The construction of Paris metro stations was carried out in a single complex style. The central part contained train tracks, and the side platforms were dedicated to passengers. This described structure is used in all metro stations. It is also important that almost all metro stations have a complex nature and follow a unified simple form - for the most part, the spaces are tiled in plain white. The almost identical choice is made in the Berlin subway.

The Moscow metro construction and its artistic-architectural appearance is worthy of exceptional mentioning; In fact, the question of artistic-architectural decoration of the interior of a metro and its main vestibule building besides the importance of the structural and formal efficiency of the transport arose for the first time in the case of the Moscow metro. Most of the projects were selected as a result of competitions. The task of each author was to grant outstanding artistic value to the underground spaces (Station: Palace of the Soviets, formerly Kropotkinskaya. Arch. A. Dushkin, I. Lichtenberg). The lighting of the underground space, a complimentary part of the overall artistic solution, was deemed a major point.

The architecture of Moscow metro stations is characterized by special opulence and manifold style. In almost every station, even the minuscule details are well thought out. Small decorative forms, embellishments, and colorful choices are handled with special attention. Simultaneously, complex structural and engineering matters are not neglected.

When discussing the Moscow Metro, the metro entry stations and their architecture should be mentioned on their own (Fig. 11.). Here, predominantly two directions are taken: "insertion" of stations in large complexes or free-standing buildings, most of which were precisely designed with a mindfulness of the surrounding environment and landscape. Most of the above-ground buildings belong to a relatively early period, are characterized by certain grandeur, and typify as independent buildings. Later entrances are merged with buildings of different functions and are framed as complex monuments. In Moscow, the discussions about the idea of a metro began as early as the end of the 19th century, adjacent to the appearance of underground transport systems in London and New York, but the execution kept being impeded for several reasons, including the conservative stance of the Orthodox Church. However, in 1931, this matter was finally resolved, and in 1935, the first line of the Moscow Metro emerged.[4]

In the footsteps of the Moscow metro, the Tbilisi metro developed, which has an extensive and deeply interesting history of its own.

## Tbilisi Metro[5]

### Political prerequisites for the construction of Tbilisi Metro

In the former Soviet Union countries, after the Moscow metro, an underground and rather complex metro system appeared in several cities concurrently. Clearly, for the Soviet ideology and the development of modern cities in general, it was prestigious to introduce new transport systems. Although, unlike European countries, in the Soviet Union the metro was not only considered an important means of transportation in cities, but it was at its core based on ideological propaganda aimed at the masses.

Therefore, the above-mentioned matter was the reason for many governments of countries of the Soviet Union, and therefore the city, to devote a lot of resources to the construction of the subway. Obviously, the necessary parameters that the cities had to meet were defined from the start.

In justifying the technical necessity to construct metro stations, the most important denominator is the population, in the lack of which, the subject is not even on the agenda for a given city. The population had to exceed 1 million, otherwise the case would not be considered.

[4] The Moscow Underground of the Stalin Time (1934-1953). Aesthetic Features, Political Significance and Cultural Symbolism, *Viktoriya Sukovata*, Underground Architecture Revisited, ICOMOS 2019

[5] Metro - ‘Kvegriala’ in Georgian

It is entirely reasonable that Tbilisi was also among the self-righteous cities of Soviet ideology. Kandid Charkviani, the First Secretary of the Communist Party Central Committee of the Georgian SSR, approached Lavrentiy Beria with the idea of building a metro but was rejected. According to Beria, Baku, as the Transcaucasian oil center, was far more fitting for the construction of a metro than Tbilisi - a city whose population did not exceed 600,000. However, Kandid Charkviani tried to resolve the issue by bypassing Lavrentiy Beria, and in 1951, during Stalin's visit to Likani, he chose an opportune time to talk about the mentioned issue. The approval was only verbal, however, soon an official decision was ordered regarding the construction of the metro and planning began. It should be noted that Charkviani's proposal was based on pre-gathered technical and economic calculations. Thus, thinking about building the metro was not a mere spontaneous decision.

On September 29, 1951, the Resolution of the Council of Ministers of the USSR No. 3637-1696 was issued with a secret status on the construction of the Tbilisi Metro. The project objective drawn up per the aforementioned resolution provided for:

• Construction of the first-line section of the metro from Battle Street (current Tsereteli Avenue) to Atskuri Street (300 Aragveli) with 7 underground stations;

• If necessary, to carry the railway constituents from Didube railway station to Navtlughi by underground track;

• The length of the metro track was determined to be 7.2 km, and the length of the railway track - 12.6 km;

• The cost of construction of the first line was estimated at 1,050,000,000 manats.

Anatoly Begun, a specialist at the Moscow Institute of Metrogiprotrans, was invited to Tbilisi for the work of uttermost importance and responsibility, and assigned to lead the project. The position of chief engineer of the project was undertaken by Mikhail Ushakov, and later by Vladimir Dandurov.

In 1952, the Metro Construction Board (later Tbilgvirabmsheni) was established under the leadership of Giorgi Nasidze[6], and an experienced specialist in the construction of the Moscow Metro and later the Transcaucasus Railway Traffic Service, Viktor Gotsiridze, was appointed as his deputy.

The project team facilitated an active execution. Within a year over 1 kilometer long tunnel and passage shafts were dug between the Marjanishvili and the Station Square. However, in 1953, according to the order of the Council of Ministers of the USSR, the construction of the metro lines of 3 cities in the Soviet Union territory ceased. Among them, it was decided to conserve the works already carried out in Kyiv and Baku, and in the case of Tbilisi, to completely terminate the operations. Referred resolution practically provided

[6] In 1933-1941, G. Nasidze worked on the construction of the Moscow Metro, and in 1941-1952, he was in charge of the Transcaucasian Railway constructions of the Black Sea coast tunnels and bridges.

for the annulment of already completed quite time-consuming works, the backfilling of tunnels, and the abandonment of their future use.

However, the said rather difficult resolution was renounced by the active informal involvement of Vasil Mzhavanadze, and the liquidation was replaced just by conservation. The conservation works laid out the possibility to continue the restoration and construction.

It must be noted as well that the Moscow Metrogiprotrans developed recommendations for the suspended metros of 3 cities, according to which it was envisaged to make use of the already constructed tunnels and shafts for defense purposes by the population. The sealed documents of classified information describe which location is to be used for which purpose and function in great detail. Accordingly, it was during the mentioned period that the essential element of Tbilisi's underground urbanism - the matter of transport connection - was replaced by the second relevant component - the defensive function, which spared the project a chance to survive.

It was by seizing this exact opportunity that the project was implemented, bypassing the official planning material, which intended the construction of defense function facilities. Obviously, the mentioned elusion engendered a great deal of liability and a certain risk, both for the project itself and for involved individuals. However, some people who defended and supported the idea of the metro construction until the very end were found both inside the project team and in the political elite of that time. As a result, the matter of the necessity of a metro in Tbilisi was substantiated, and the project team called for an explanation in Moscow and was able to convince the committee that with the completed works, they simultaneously obtained the shelter and the metro. In 1960, the construction of the Tbilisi Metro was officially decided and the works resumed. Tbilisi Metro officially opened on January 11, 1966 (Fig. 12).

## Technical parameters of Tbilisi Metro

The construction of the first metro line was planned alongside the Mtkvari River, and Didube became its departure point. Its 6 stations (Rustaveli, Marjanishvili, Vagzali Square, Oktomberi, Elektrodepo, and Didube) were allocated on the planned line. The distance between stations was generally around 1.3. km, but later the distance increased.

Initially, one-way transit was administered between the Didube station and the station square. In 1967, the second line laid between Didube and Elektrodepo was put into operation. On November 7, 1967, the second zone, Rustaveli - 300 Aragveli was put into service Among them, 3 stations were launched, Lenin Square, 26 Komisari, and 300 Aragveli. In 1971, the third zone in a row, the 300 Aragveli-Samgori area, was developed. In 1979, the Saburtalo line was implemented, which included 5 stations (Fig. 13).

By this time, it was already planned to build 4 additional stations: Ghrmaghele, Temqa, Avchala Highway, and Gldani. In 1985, the first two stations (Ghrmaghele and Temqa) opened, and in 1989, Avchala highway and Gldani stations. In 1985, after Samgori station, Varketili station opened.[7]

In general, the metro station system, due to its complex engineering features, is classified into several types. These are above-ground, shallow, and deep column stations, and structurally, underground stations are divided into column, pylon, and single-vault stations. The type of stations mainly depends on the metro route and geological-technical conditions. All metro stations in the world are built within the framework of this system. Naturally, such a system was used in the construction of the Tbilisi metro. As a result, we have all the above types of stations in the city.[8]

## Architecture of Tbilisi Metro

The architecture of the metro stations is, of course, primarily based on the site's characteristics, but besides the technical necessity, every station has an idiosyncratic artistic-architectural face and in many cases, it also bears the signs of epochal architecture. It is noteworthy that in the architecture of the metro stations, the stylistic tendencies of the time can be seen, and the contemporaneous innovations of the era are also clearly legible.

It is important to divide the stations based on periods and to understand their inherent characteristic style, along with this, the typology of the buildings themselves must be taken into account.

## Didube Metro Station

First-line metro stations Didube and Elektrodepo belong to open-type stations, both are above-ground stations with underground developed infrastructure. The architectural solution of both stations is dictated by the difficult terrain and the presence of nearby railway lines. The striking difference in the level of the train track and the streets of these stations influenced the presented compositional decisions made by the architects (Fig. 14).

In both stations, the main emphasis is on the complex structure of the building. In the case of Didube, the access from the upper level directly to the station involves several steps, including an open bridge connecting the street and the main pavilion, which also leads to the lower level through stairs. The route is actually manifested in the architecture as well, as its architectural rendition is almost transparent and all architectural details are exposed to the outside. The direction of the passengers moving to and inside the

[7] Jashi N. Socialist Tbilisi Architecture, Tbilisi, 1983, p. 66

[8] Gengiuri Nato, Architektur der U-Bahn-Stationen von Tbilisi – Vergangenheit und Gegenwart. In: Underground Architecture Revisited. ICOMOS Deutschland. Berlin. 2020.

building creates the focal axis that animates the architecture itself and, so to say, incites its artistic effect (Fig. 15, 16).

The thin-roofed construction of the Didube station itself, resting on columns, fabricates a weightless form, the entrance of which appears as a wave-shaped fluid element (Fig. 17).

The platform - the central part rests on columns thinning at the bottom, the roof also stems from this form and spreads out like a pendentive at the corners. The space is spacious and open, the silhouette is clear and light. The general architectural-artistic lightness of the construction emanates refined architectural taste.

In the architectural project of the Didube station, the intention of the authors to create a form harmonious with the environment is vividly apparent. A fairly green surrounding area is embraced in the architectural expression - using color, various new-age materials, and textures - the simple form comes first and gains an artistic expression. The authors thoroughly analyze the organization of the project and the surrounding space. They try to create a totality with separate artistic accents (Fig. 18).

In addition to the above-mentioned group, free-standing above-ground pavilion stations as well as stations merged with a particular architectural complex are worthy of special mention.

In the free-standing above-ground pavilions, it is possible to distinguish two sub-directions: above-ground pavilions, actively integrating the environment: Oktomberi Station, 26 Komisari, Isani, 300 Aragveli. and relatively monumental, closed-type buildings in the fashion of the upper vestibule of the Rustaveli metro.

## Rustaveli Metro Station

Among the metro stations of Tbilisi, the Rustaveli metro station (L. Janelidze, O. Kalandarishvili, E. Amashukeli) is particularly remarkable, which in its perfect artistic-architectural form can be defined as a complex monument (Fig. 19).

The above-ground building of the station is located in a small square in the historical part of the city. The circular shape of the building and its sectioned surface create an organic, natural, and fluid transition with the surrounding development and uneven terrain. The shape of the station is flexible and blends naturally with the environment. The entrance to the metro is adorned with a fairly large bas-relief. The frontally developed composition cooperates with the exterior and at the same time creates a cozy space in the entrance section.

The above-ground vestibule is round and laid with white marble tiles. The upper section is white as well with vertical dissections, which brings a peculiar dynamism and rhythm to the interior. Via a rather deep escalator, we go down to the underground station, where a fairly vast vestibule gradually enters the view. While moving on the escalator, the columns, expanding from the bottom to the top, unfold from different

perspectives, which enhances the sense of monumentality of the space.[9] The interior decoration is carried out employing a perfect combination of building materials and artistic forms. Columns and walls are covered with reddish-brown marble. The floor and plinth of the train track wall are black, while the ceiling and upper part of the wall are white.

From the viewpoint of artistic decoration, the embossed elements are remarkable, where Shota Rustaveli's portrait itself and circular decorative compositions are inserted.

The Rustaveli station is throughout and complete, both in terms of architectural expression, as well as in the consolidation of architecture and decorative arts in its plastic form, and reflects almost all the key features characteristic of late Stalinist monumental architecture.

Metro stations Oktomberi, 26 Komisari, Isani, and 300 Aragveli, are buildings designed with almost exact apparatus, only Isani station differs in the sense of the station's construction and the architecture of the upper vestibule. In all cases, we are dealing with the integration of a new independent building with its surroundings. Accordingly, in addition to the engineering-geological factors, architects face the most important concern of integrating buildings as a new element into the given environment. All of the listed stations, except for 26 Komisari, are not located in a historical environment and thus have the opportunity to reinterpret the surrounding environment and form a new expressive language.

### Oktomberi Metro station, current Nadzaladevi

The upper pavilion of the Oktomberi metro station is planned parallel to the main avenue, slightly deeper, simplicity in the building's design leads to a distinct architectural expression. The small square leading up to the building is a kind of transitional space, the balanced landscape design of which appears as an artistic supporting element to the simple architectural form of the building (Fig. 20, 21, 22).

The above-ground architecture of the building is characterized by a kind of simplicity and refined form. The main structure rests on massive columns, which are both constructive and at the same time add a sense of solidity to the building. These columns are the strong vertical accent of the horizontally spread facade, which capacitate an auxiliary effect from the outside. Simultaneously, this secondariness is also an emphasis of the primary form/facade.

The facade, assembled with large vitrines, follows a geometric shape, which is completed with a quite wide cornice. It is worth noting that the margin of the active wings of the lower level of the building is slightly lowered, which is why the building seems to be standing on the ground and slightly levitates. This kind of architectural-visual trick gives lightness to the building, furthered by the architectural face; open glass

[9] It is worth noting that, scientists propose this form to be considered as an attempt to interpret the 'mother column' of the traditional hall

vitrines are used not only on the main facade but also extend to the side sections, which are visible in the interior space as well.

Such harmony of interior and exterior determines the core value of the building. Added to this are the artistic details positioned in its interior.

The main component of the interior of the upper pavilions is a rather large panorama of Tbilisi (author K. Ignatov). This panel is a breathing element and blends with the interior of the building, with its material and color palette. The panorama plays an important role in the reading of the overall picture of passenger traffic itself. It gradually becomes visible to the passenger coming out of the escalator and appears in its fullness when moving into the pavilion.

The panorama placed deep in the lower station was modeled on the principle of creating contrasts, which as a result of the rehabilitation was replaced with A. Gurgenidze's work.

### 300 Aragveli Metro station

The upper pavilion of the 300 Aragveli metro station, similar to Oktomberi, is designed with a combination of simple architectural forms. Here too, the environment plays the main role, as the essential defining element of architecture. Unlike the Oktomberi station standing at street level, the building is placed on a plinth-like step. A few steps leading towards it, alongside the calm facade, create an architectonic dynamic. One of the components of its ties with the environment is a small pool in front, which enters the image of the building as a water mirror. The building reflected in it was granted artistic weight. Unlike Oktomberi, the mass of the wall is felt more so in the side facades, although the wall is processed in such a way that it does not create a massive surface, but attains a decorative purpose (Fig. 23, 24).

In front of the building, next to the pool, an equestrian figure was later placed, which was organically cohered to the architecture of the building. The building staged a sort of background for the supple form placed in front and became its organic part.

The transport station belongs to the pylon type, clad in a variety of materials, including Bolnisi tuff, marble, and granite. In the central part of the interior, the blind wall is decorated with an embossed bas-relief dedicated to 300 Aragvians (author T. Gigauri) (Fig. 25).

The plasticity of the bas-relief is juxtaposed with the milky texture of the wall, and the lighting enhances the non-reflective surface. The wall and the decorative surface, contradictory per the principle of contrasts, comprise the main artistic sword of the interior.

### 26 Komisari Metro Station current Avlabari

Along with the above-mentioned stations, we must touch upon the 26 Komisari, the current Avlabri metro station. According to the original plan, the pavilion was intended to be combined with the building, but in the end, it was decided to place it independently. The metro station is located in the historical center of the city, there used to be a development in this place in the past, but its specific location was selected during the reconstruction of the square (Fig. 26).

Due to its location, the building is situated in such a way that it adopts an urban planning function. The upper station of the metro is a plain horizontal rectangle, which creates an elegant, simple, and unpretentious architectural form.

The architecture of the building is grounded on plain forms, the dominant plane of which consisted of a penetrating, open stained-glass space. Only the white stone-paved cornice formed its finishing trim. The rear transverse facade of the building was enhanced with the same composition.

The same kind of stone trim was used on the corners of the building, even encompassing the building. Open continuous stained-glass windows were distinguished by dark-tinted edges. Due to the open space, the simple interior of the building and its decorative insert on the right side remained easily visible.

Later, in the 1980s, it was decided to erect a massive multi-figure sculpture in the left section of the metro station. In 1981, the sculpture *Friendship*, representing 26 commissars, was placed on the right section of the upper metro station, authored by D. Sikharulidze, architect and constructor O. Litanishvili, and A. Guruli (Fig. 27).

The multi-figure sculpture was a monolithic structure with four warrior figures holding hands. Quite monumental, powerful figures were placed on a pedestal, making them stand out from the general space. The statue incorporated a specially prepared horizontal plain background, which also created an accent and highlighted its importance in the common space.

The sculpture was based on a well-thought-out concept, which obviously backed the Soviet spirit, but molded an interesting and characteristic artistic form for the era. In the 1990s, the statues were decapitated and removed soon after. Today the fate of the statue is unknown, it is probably entirely destroyed.

## Isani Metro Station

Among the metro stations with free-standing vestibules, Isani metro station calls attention (architects G. Modzmanishvili and N. Lomidze, engineers I. Geladze, L. Kamkamidze, V. Dandurov, M. Buka, M. Barsegova, 1971). The above-ground pavilion, with its unique roofing system of a complex constructive nature, is completely different from other stations: the roof over five curved surfaces rests on four pillars, creating a weightless structure. The roofs bear a resemblance to sails, flapping at the corners, which together with the supporting structures create a complex and dynamic form. *This was a novelty for Tbilisi at that*

*time, as well as one of the earliest examples from past architecture of hyperboloid-paraboloid roofing in the USSR.*[10]

The use of the mentioned particular construction was a new word not only in Georgia but also in the West, where the use of this complex construction form began in the 1950s (Fig. 28, 29). Isani station is distinguished by its original design and bond with the environment. The small garden situated in front facilitates a harmonious interrelation of the architectural form and the landscape. Isani metro station, with its artistic-architectural complex dynamic form, back then and even now, offers a completely fresh form and exemplifies an exceptionally interesting Georgian public architecture.

Isani underground station is quite long, this impression is enhanced by the monotonous row of columns of an elliptical cross-section. The artistic face of the interior is built on the principle of contrast - white columns, black floor, black and blushy white colored walls - creating an interesting gradation.

As we can see, the architecture of the above-mentioned stations is individual, diverse, and fully apt to the environment. Despite certain similarities, there is no repetitive form among them, each station is designed with the environment in mind. Complex constructional forms are thoroughly thought out, and the mode of expression is on the whole contemporary and innovative. Different branches of art are combined in the outdoor and indoor spaces. The architecture itself, together with the incorporated individual artistic forms, are of equal importance and to be more precise, their organic connection.

The architecture of metro stations shows the course of development of Georgian modernist architecture, which is also fully in line with the trends of Western architecture of that period.

In the above-mentioned typology, we should separately discuss the edifice complexes and the metro stations integrated into them. It should be stated that in underground urbanism, one of the most common forms found is indeed the stations incorporated in complexes, examples of which are numerous in different European countries. In Georgia, three stations have been created with this approach: Railway Station Square (architects: Revaz Bairamashvili, Davit Morbedadze), Lenin Square (current Freedom Square, architects: Revaz Bairamashvili, Vladimer Alexi-Meskhisvili, Ketevan Kobakhidze), and Marjanishvili Station (architects: Shota Kavlashvili, Neli Kvartskhava, Temo Mikashavidze, Givi Melkadze).

The earliest from the list is the Marjanishvili metro station. The station is located on the first floor of the administrative building, which in turn is the outcome of the reconstruction of the historical part of the city in the 1940s. However, it should be mentioned that the Marjanishvili station was created by reworking the pre-planned and executed structure of the underground shelter.

The underground vestibule area of Marjanishvili consists of three parallel halls, connected by arched passages. The main artistic quality of the vestibule is the interior decoration, which is mainly finished in two colors. The walls of all three halls are lined with ivory marble blocks. A sculptural portrait of director Kote Marjanishvili, cast in bronze, is placed on the central wall (sculptor - Merab Berdzenishvili). The

[10] 20th Century Architectural Heritage - Tbilisi Metro Stations, N. Gengiuri, p. 64

portrait, in its fluent form, frames a certain contrast with the marble background and stands out in a dominant manner (Fig. 30, 31, 32).

Arched passageways between the spaces, on their interior plane are set with dark marble, and in juxtaposition, the floor is set with polished Borjomi granite. Benches along the walls and massive columns are made of the same material. The edges of the passenger platform floors are finished with an asphalt trim, embellished with inserts of square tiles of contrasting color. This element in a way refreshes the interior while also serving as a security measure.

Similar to the vestibule of Rustaveli Metro, small decorative elements are used in the interior details - ventilation grills resembling theater masks.

### Lenin Square Metro Station, current Freedom Square

Worthy of separate mention is the station, formerly known as Lenin Square, currently Freedom Square, which was integrated with the Univermag Tbilisi Complex (Fig. 33, 34).

Three functionally varied, independent parts were masterfully combined via composition. The complex included Univermag Tbilisi, Lenin Square Metro Station, and Aleksander Griboyedov Drama Theater.

The chief concept of the complex was determined by clear planning and an independent and simultaneously unified structure of individual parts. The main building of the Univermag was developed along the perimeter of the avenue. It rested on strong pillars. Five central pairs of columns formed a colonnade, which contributed to the formation of a transitional space between the street and the inside courtyard. The coziness of the yard was assured by its situation on a higher level compared to the level of Rustaveli Avenue. As in the classical atrium, there was a pool in the center. This yard, similar to the entire building, served as a multifunctional space.

The yard gathered additional Univermag entrances and two open staircases leading down from the second-floor terrace. The right terrace extended to the building of the upper metro station and formed its roof. From a deep enclosed space, there was an entrance to the round vestibule of the station. The main entrance to the Griboyedov Theater was located in the inner courtyard and was finished with colorful decorative stained glass, made according to the sketch of the artist Jibson Khundadze. The pillars and outer walls of the entire complex were set with light-colored Eklar stone[11]. Unfortunately, it has to be mentioned that the late, very interesting example of the above-mentioned modernist architecture was demolished and a new shopping center building was built in its place. The metro station and the Aleksander Griboyedov theater became part of this structure, and both of them completely lost their individuality.

[11] https://taa.net.ge/archive-geo/ცენტრალური-უნივერმაგის-კ/

The entrance of the Freedom Square station and the main vestibule, which is provisionally divided into two functional parts, are very interesting. It is from here that we enter the lower station. The main interior is held by columns clad in white marble, which, as intended, together with the lighting produced the main effect of artistic articulation. The artistic plan of the space was decided on a white tone, which is stirred up by the colorful plinth of the ground and the train track.

## Tsereteli Metro Station

In 1970-1973, the second line of the metro station Saburtalo was designed. It should be said that compared to previous years, the stations no longer have above-ground pavilions and they are mostly underground, relatively simplified structures. However, Tsereteli Avenue is an exception among them, which follows the architectural style of the previous period. The space of the station is divided into three parts, the interior is clad with high-quality granite and marble. The main focus of the vestibule is the sculptural face of Akaki Tsereteli, made by Elguja Amashukeli (Fig. 35).

## Technical University Metro Station

In the interiors of stations of the mentioned period, a kind of simplification of the architectural concept of space is striking. The space includes one undivided open hall, which in turn adds rawness and lightness to the station. However, it was precisely as a counterweight to the simplified architectural forms that outstanding examples of decorative art were created, such as the decorative panorama of the "Politeknikuri" Metro, which attracts the passengers's attention with its colors, compositional simplicity, and varied motifs (authors. R. Tordia, A. Kharebava, I. Tabidze) (Fig. 36).

Thus, it seems that the architecture of metro stations, their artistic interpretation, design, and individual artistic or architectural forms, down to the smallest details, were based on the functional-fundamental and artistic-architectural concepts thoroughly apprehended by the authors. Every little detail was deeply considered in them. The artist Shota Kuprashvili created a special font for the Tbilisi metro, which was used in all stations. The outline of the letters, and their plasticity, on the one hand, determined the clarity of the sign, and on the other hand, created an exclusive font intended for the unified Tbilisi metro stations (Fig. 37, 38).

## For the matter of the synthesis of artistic forms

When discussing public architecture, especially underground urbanism, it is impossible to discuss and understand this matter without a synthesis with art. Not only in Georgia but throughout the world, the main consumer of public architecture is the society itself, which inevitably requests the building and its formal artistic repertoire. A particular building or ensemble can reflect political, and public worldviews, and

indicate lifestyle, aesthetics, taste, and even demands. Obviously, in certain cases, the most important direction-giver is the customer with political power, however, in such a situation, some participant - an artist or a union of artists - might have the chance to "shine".

The interrelationship of architecture and monumental painting, with the applied-decorative arts, count centuries - the world's largest monuments and the art of countries (Egyptian, Babylonian, Greek, Roman art, up until this day) are exact proof of this, although we will not delve into the nature of this synthesis here. Our profound interest is the underground urbanism of the 20th century, and in particular the synthesis of architecture and art of metro stations.

When discussing this matter, we cannot ignore the period's art and architecture. When talking about the Georgian art of the 1960s-1970s, particularly painting, the main condition remains the Soviet ideology, which, compared to the leading years, is more thawed and, one might say, liberal. Ideological censorship is no longer so strict, and therefore individual artists produce images differing from the Soviet collective ideology. In fine arts of the mentioned period, the interest in creating generalized faces and perceiving the world from a completely different perspective is visible. Artists attempt to fully reveal their worldview, express themselves and, in some cases, show their attitude towards the existing reality (K. Makharadze, G. Toidze, R. Tordia).

In the visual language, compositional-structural decorativeness, monumental icons, and synthesis of fluid and decorative-planar forms prevail. Monumental decorative painting is on the rise, which borrows the monumentality associated with sculpture and engraving. However, it must be said that the slogan *formally national, conceptually socialist* is still relevant, and art is more or less bound by this slogan.

*Modern art and architecture aspire to each other, generating an international form and front, albeit this trend does not intercept the individual development of the art of different nations*[12] - The posed quote clearly shows the 1960s-1970s escalation of the national aesthetics trend and at the same time a kind of attempt to synthesize art and architecture, which in a sense was declared at the first exhibition of monumentalism in 1961.

The referred thaw period, unlike fine arts, was reflected far freely in architecture. It is significant that during this exact period, several Russian-language architectural magazines made their way in, such as *Америка*, *Англия*, *Domus*, *Décoration*, and others. These media and the buildings published in it certainly created more opportunities for architects, the modern forms created with this inspiration and interpretation were utilized in the architecture of many cities in the Soviet Union, including the architecture of the 1970s Tbilisi metro.

[12] Аралов Ю. Национальные традиции б архитектуре обшественных зданий. Цинтез искуццтб и архитектура обшественных здании. 1974. стр.51

## Metro as a public space

When discussing the metro system, its public or transportation significance, the specifics of the city where the metro stations are situated are always to be considered.

The proposition of constructing a metro in the earliest European cities is mainly based on the urban challenges and needs of the city, related to its expansion and the solution of transportation issues. In most cases, such issues are planned within the framework of the general plans of the cities (in a multifold regard) with a unified understanding of complex above-ground and underground urban connections and account for various aspects.

For the former Soviet countries, the metro as a whole is considered not only as a means of internal city transport but also as an instrument of Soviet ideology. Metro, a public space, is the underground temple of communism, where the wide societal masses are allowed to take advantage of and use it.

It was very important for Soviet propaganda aimed at the interests of the general masses to create opulent, ceremonial, rich, sort of palace-like spaces for the people, where it is exactly through particular forms of art that the opportunity to demonstrate ideology arises. That is the reason behind the metros of the former Soviet countries' cities, unlike other European or American examples, are more celebratory, magnificent, and luxurious; In the literal sense, wealth is demonstrated in material and the eminence of artistic forms. Thus, the metro is functional on the one hand, and on the other hand, has a great ideological role (an example would be the Moscow metro to illustrate this).

At the same time, it is also clear that the artistic-architectural face of the stations is directly related to the socio-cultural-political life of the period and practically serves as a kind of guide to the architectural development of the Soviet period. The artistic-architectural analysis of the metro in the post-Soviet countries would showcase the development course of 20th-century architecture, its characterization ranging from social-realist-monumental to modern form.

Ascribed to the fact that the architecture of Tbilisi Metro is connected to the 1960s, the artistic-ideological richness (literally and figuratively) can be seen in only a few examples. Significantly, the elements of the Georgian national motif are employed to the maximum. In this regard, examples of late Soviet architecture are interesting and advance the idea of public space using various artistic forms.

## Metro stations - as public art space

The idea of creating one of the most impressive metro stations in Europe, namely in Stockholm, in the 1950s, was found in the mighty slogan of the Swedish Social Democrats: *the People's House*. This idea included not only free healthcare and convenient transportation for the community but also common culture. From the beginning, they believed that art should be accessible to everyone and everywhere. In accordance, most of the metro stations acted as such public spaces (Fig. 39, 40, 41).

Near interesting examples are the metros of London, Paris, Bilbao, Berlin, and New York, and their artistic resolutions. The University metro station in Naples should be mentioned separately, the reconstruction of which belongs to the New York artist Karim Rashid and practically amounts to his solo show (Fig. 42, 43).

Apart from Europe, the metro stations of Kyiv and Moscow carry a rich heritage. In referred buildings, similar to Georgia, the political order and demands of that time can be easily discerned. In the example of all three cities, the main course of development and the trends characterizing each period are visible. In comparatively early stations and their artistic rendering (Moscow, Kiev) a distinct stylistic frame of the interiors and decorative art that is subordinated to architecture dominates. Since the 1960s, decorative ornamentation remained subordinated to architecture, however it takes on more individual forms. Such an approach is the result of the international exhibition of monumentalism held in Moscow in 1961, following this period decorative art held a major role in public buildings. The artist is practically the co-author of the architect, who equally conceives the encompassing idea of the entire building, including even the smallest details, and artistically pronounces the form. It was during this period that the aesthetic and ideological problems of the artistic form underwent a significant expansion. It had to play a major ideological role and at the same time become an organic part of the architecture.

Tbilisi Metro and its architecture have gone through almost all the stages of planning and understanding underground urbanism and public spaces - starting from monumental form, finishing with modern architecture, and in each work were able to exhibit the interpreted national form (architectural, verbal, and more) along with the contemporaneous. That is why the architecture of stations and their interiors should be discussed in the context of Georgian modern architecture.

## Metro difficulties and everyday life

The metro system is complex, and it requires the day-to-night labor of many workers together with a precise and appropriate infrastructure for it to function properly.[13]

There are 59 tunnel escalators of six types in the Tbilisi metro, the total length of which amounts to 10 km. All escalators are subject to daily scheduled precautionary maintenance and repair works that are measures of technical processes. After a span of 140-150 000 kilometrage (approx. 10-22 years) capital repair or renewal of the full inventory of escalators is required.

In stations equipped with escalators, there are lower passages to the escalator pits for service personnel. A single escalator station is managed 24 hours a day by an escalator operator and a blacksmith; Also, two escalator stations are attended to by one technician. All escalator stations are equipped with so-called demolition pits that get lifted outside the station (which must be accessible by car transport as per requirement), from which point bulky and heavy parts of the escalator get transported.

[13] https://teasblogi.wordpress.com/2020/03/21/თბილისის-მიწისქვეშეთი-მ/

The metro is served by two depots: Nadzaladevi (depot №1) and Gldani (depot №2). The first serves Saburtalo, and the second - Gldani-Varketili line.

After passing a certain kilometrage (on average once a day), trains alternately enter the depot, where they undergo a special inspection. The wagons are washed from the outside and cleaned from the inside as well. The train reaches the depot through a contact rail (the train comes into contact with the contact rail through a special wing where 825-volt electricity passes and operates via this). At the entrance of the depot, the train gets attached from both sides to the special ropes (hooks) lowered from above, with the help of which it is brought into the depot. Train drivers work 8 hours and rest for 12 hours on average. There are special restrooms in the depot, where drivers (who finish work at 1 a.m.) can sleep till morning.

The train movement and schedule are controlled by the so-called dispatching office. The trains touch the "cable" above the tunnel, by means of which their location is noted in the control room. The driver has a direct connection with the dispatching office and through the dispatchers he knows when to reduce or increase the speed. The ventilation shaft rises above the ground. It also doubles as an emergency exit. It connects to the bypass tunnels. The airflow from the shaft is distributed using a giant fan and vertically "stacked" walls. There is also a hermetic door at the entrances of the ventilation shafts, which will be closed as needed and will isolate certain sections.

A rather difficult daily task is pumping water, the amount of which exceeds 25,000 tons per day. Also, in the tunnels and shafts, regulative pumping is carried out, during which the cavity behind the wall, caused by soil water, is filled. They are identified by a specialist, processed, and prepared by use of drills. It is filled with cement solution and a special pumping machine using the method of tamping.

The rails of the trains are also changed every so often, this is called rail wear. At this time, a substantial amount of rails are removed and replaced with new ones.

Significantly, the Tbilisi metro underwent a large-scale infrastructural project of electric system modernization only a few years ago, which was implemented within the framework of the Sustainable Urban Transport Investment Program agreement between Georgia and the Asian Development Bank (ADB). In the Tbilisi metro, approximately 500 kilometers of power cables were replaced in the tunnels and 32 European standard air conditioners were installed, which ensures the smooth and safe functioning of the metro, which is crucial.[14]

At the same time, it should be said that the rehabilitation project of metro stations is also being carried out periodically, which in many cases (in the case of dated stations) does not include the preservation of their artistic-architectural authentic face and, unfortunately, completely alters its look.

[14] https://tbilisi.gov.ge/news/11227

## Metro stations as historical memory and the necessity of their preservation

Thus, it seems that the Tbilisi metro, the history of its origin and development is complex and rather contradictory, yet it is undoubtedly one of the most active components of the city's transport policy. Its urban transportation role is extremely important for the functioning of the city. It can be said that the metro is the backbone of the underground urbanism of the city, which constitutes a unified living organism. Its maintenance, proper exploitation, and management should be considered in the overall context of the development of the city's transport policy.

The orderly functioning of the metro system is directly intertwined with its architectural memory, which, as we have already mentioned, has its own line of progression and in many instances carries high artistic-architectural value, therefore it must be properly maintained and preserved.

As of today, only two stations - Rustaveli and Freedom Square are included in the Cultural Heritage list of Immovable Monuments. It is significant that after being put on the above-mentioned list, the complex exterior architecture of Freedom Square has been completely altered. This indeed attests that flawed interventions, even under the auspices of rehabilitation, completely change the original appearance and give inaccurate results. The neglect of metro stations' interior details, employed architectural or decorative forms, directly correlates to rehabilitation. Already in the 1990s, a number of statues or small decorative forms present around or inside the stations were removed and replaced.

It must also be stated that in our country, the architecture of the late Soviet period is neglected and its essence is not comprehended. The above-mentioned examples are interesting both in terms of their architectural-constructional form, as well as their active and harmonious cooperation with the environment. Since the 1990s, the environment of free-standing metro stations has changed and distorted so much that in some cases it is impossible to read the originality of the architectural form itself. Here, it is worth noting the uncareful reconstruction that takes place in the stations - replacement with low-quality and unsuitable material, which obviously diminishes their overall artistic, spatial, and architectural value.

In this respect, it is important to revise the issue at the community and municipal level not only from a technical transportation standpoint but also to emphasize the architectural apprehension of the stations and their idiosyncratic, riveting stylistic, and artistic features. Before planning the technical rehabilitation of each station, it is also important to:

- Individually study the artistic-architectural value of the site, starting with stylistic characteristics and ending with architectural details;
- Understand the surrounding environment of the stations (in the case of aboveground stations) and the role of a specific building;
- Understand the individual artistic forms and elements (this applies to almost every station) in the interior of each station;
- Understand the artistic decorative elements of each station, construction material, color palette, lighting, and more;
- Only develop individual recommendations based on case studies and analysis;

- Determine (if necessary) the possibility of placing new individual artistic forms depending on the individuality of each site.
- As for future planned metro stations, here we have an opportunity of complete freedom to devote these spaces to contemporary art and create entirely new, functional public spaces (announce competitions for artistic decoration of new stations, etc.).
- It is important that the eligible sites (based on the study) be given the status of Immovable Monuments of Cultural Heritage and their legal protection;
- It is still relevant to manage the issue from an educational angle and to inform the general public. The preparation of certain advertising campaigns, videos, lectures, and an extensive discussion on the stations, and their artistic-architectural context, which once again shows the multifaceted potential of this functionally vigorous social project.

Today, it can be safely stated that the history of Georgia has indeed passed through underground since the 1960s. The Metro, together with the society, has experienced the economic-political-social difficulties that have been at issue over these ten years. However, maneuvering through all these difficult times, the necessary presence of art in the public space for the proper functional development of a present-day city becomes apparent and has proven that the metro is a living, active organism, proper protection and tending to which is essential.

Illustrations:

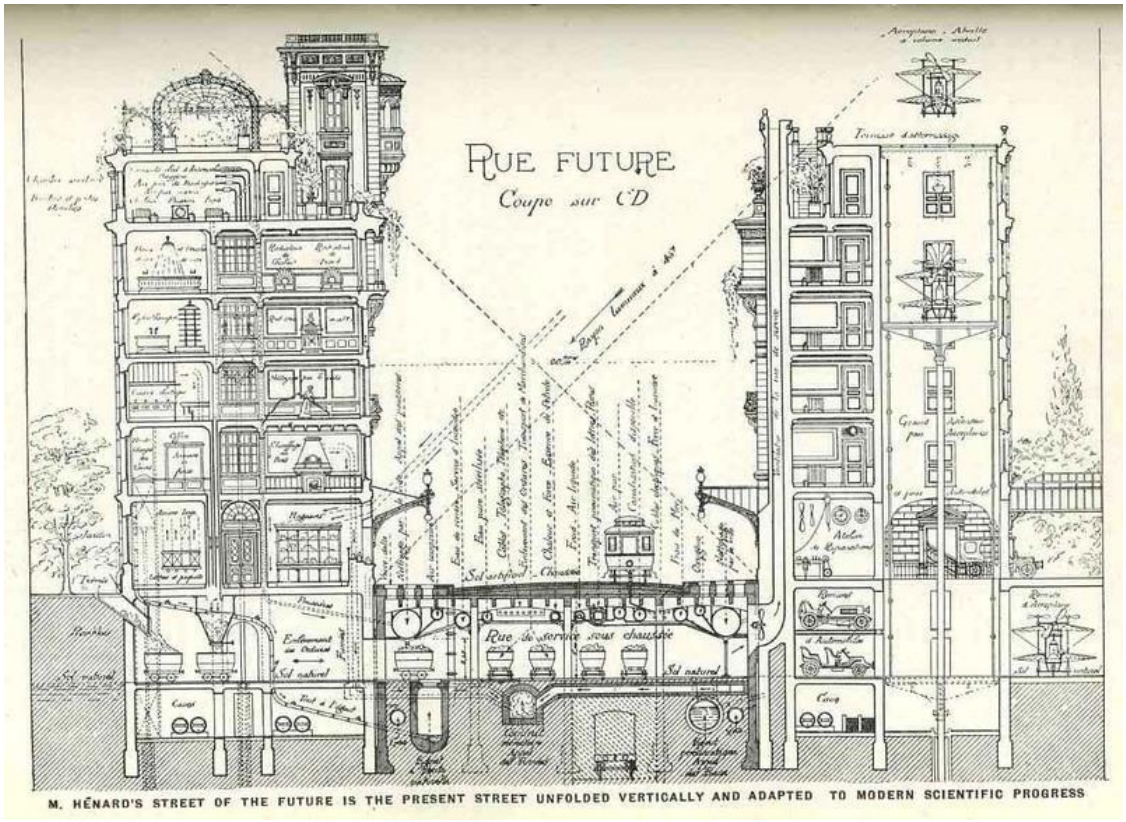



Fig. 2. d'Eugène Hénard. Sketch for the project "Street of the Future"

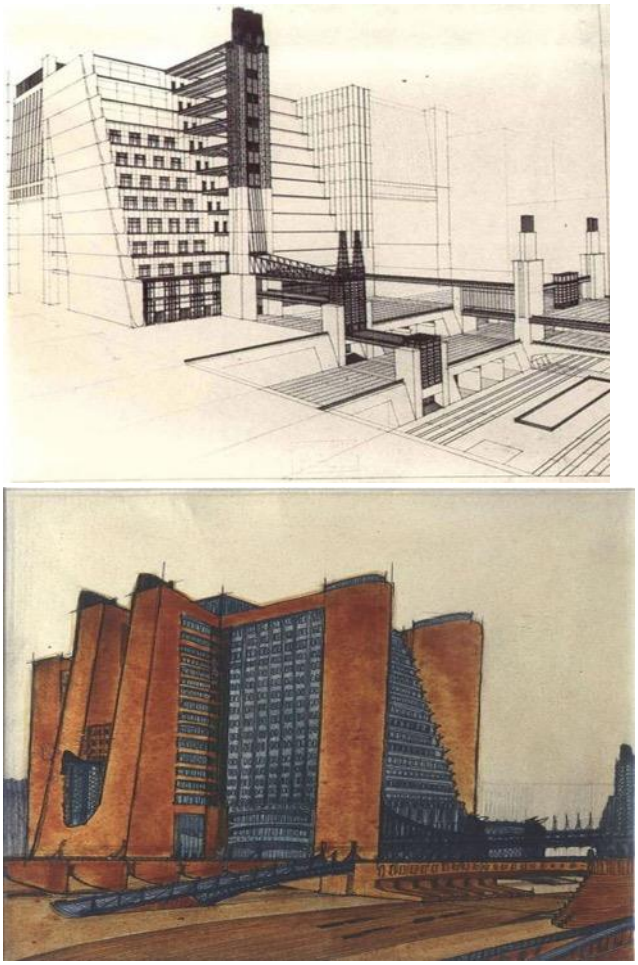


Fig. 3.4 a. Sant'Elia. Sketch for the project "Futuristic City"

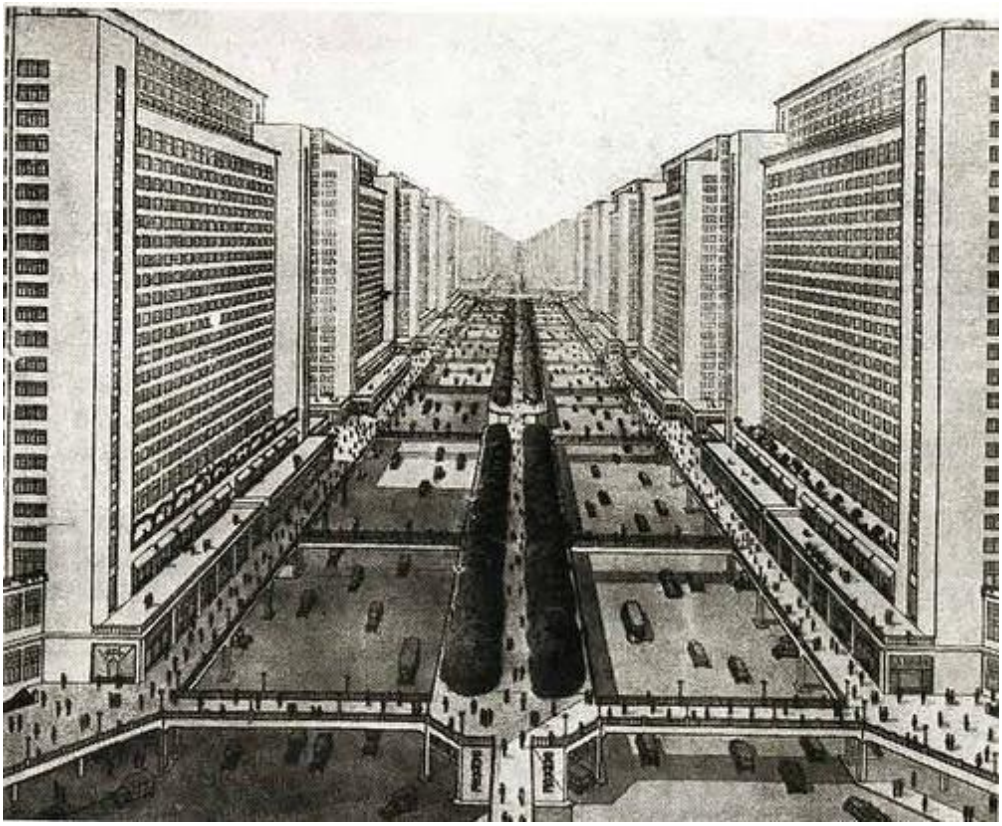
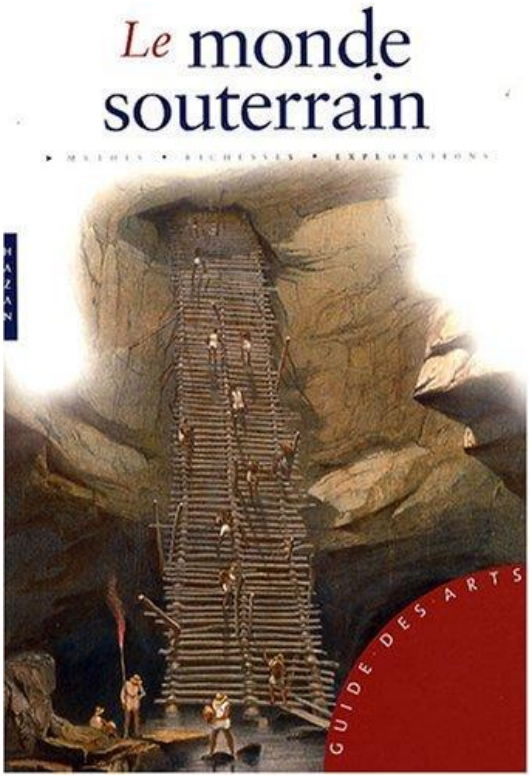


Fig. 5. Le Corbusier. Sketch for the project "Shining City"



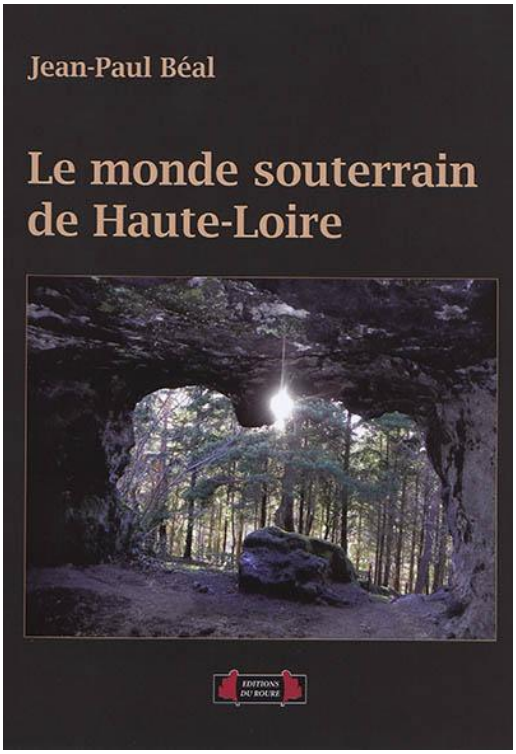




fig. 6.7. "le monde souterrain" magazine

Fig. 8 Exposition Internationale Paris 1937

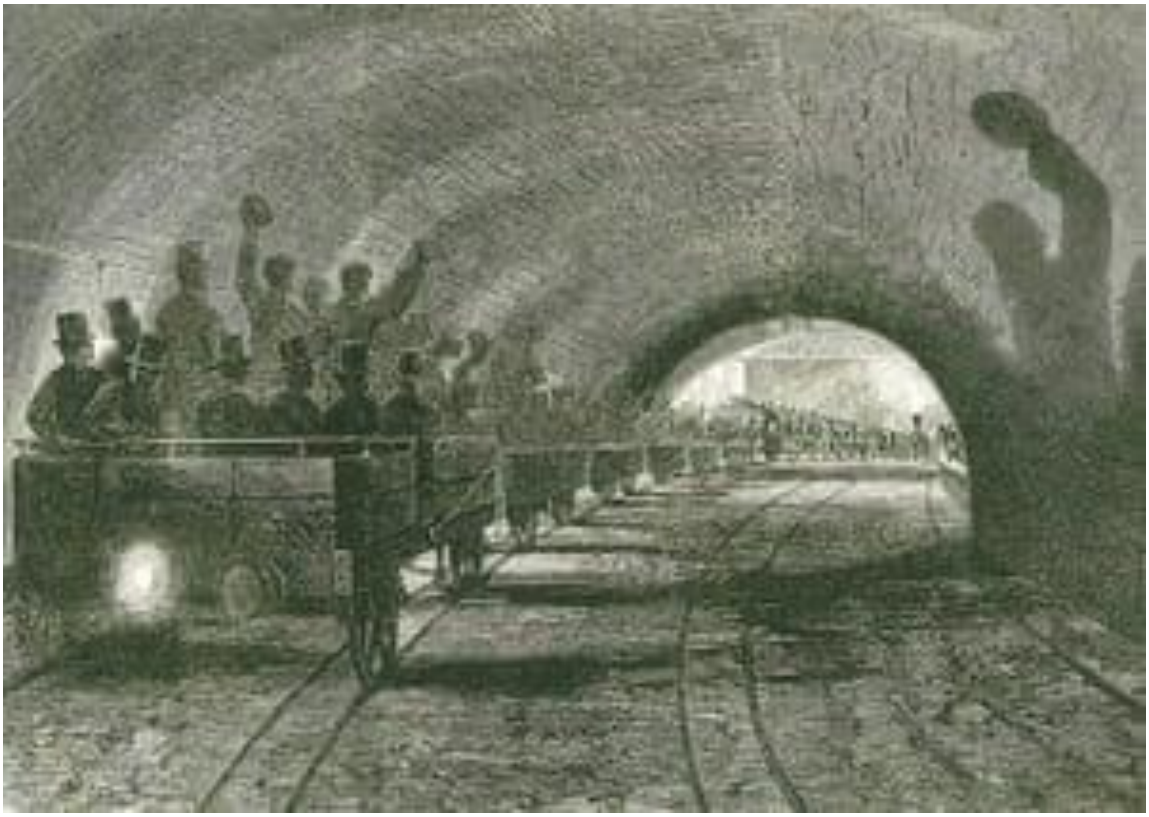


Fig. 9. London Underground. Engraving. Photo courtesy of Getty Images

Fig. 10. London Underground. Engraving. Photo courtesy of Getty Images


Fig. 11. Moscow Metro, "Kropotkinskaya" station, 1935

Fig.12. The first wagon of the Tbilisi metro, 1966. Central Historical Archive

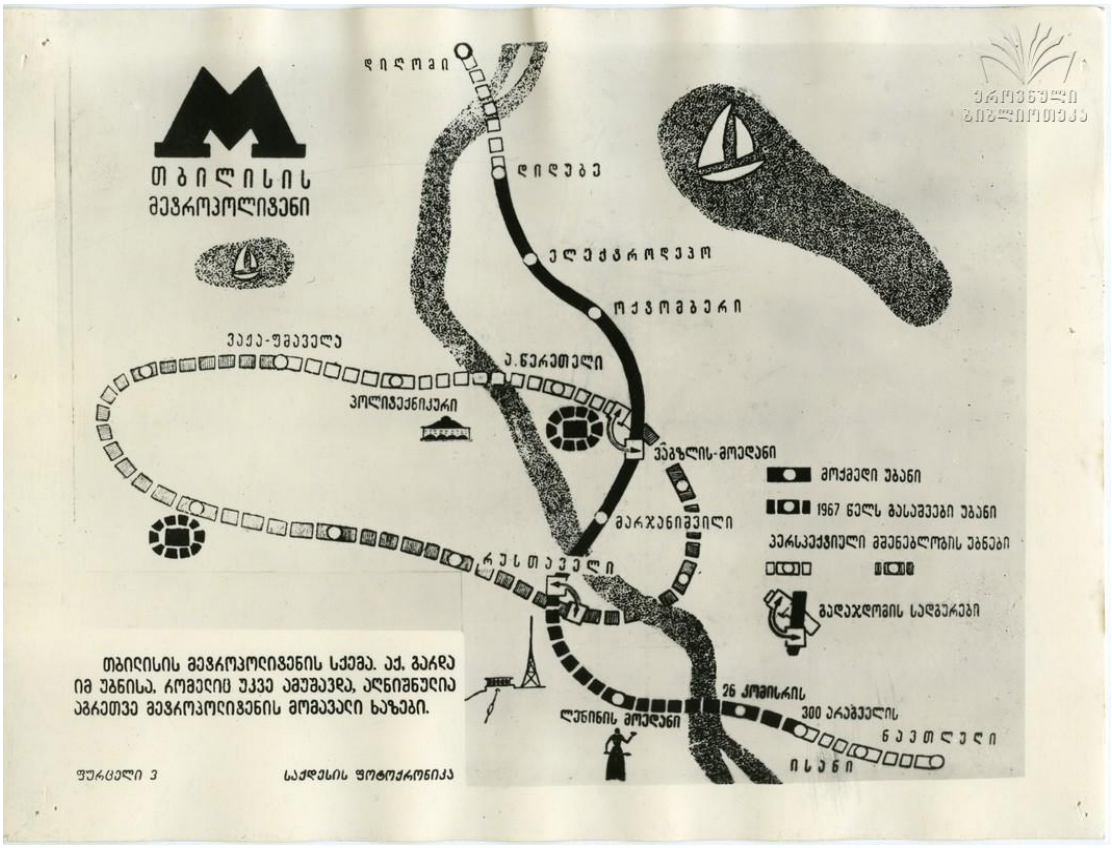



Fig.13. Tbilisi metro scheme. Central Historical Archive

Fig.14. “Didube” station, 1966. Central Historical Archive

Fig.15, 16. Stations “Didube” and "Elektrodepo", 1966. Central Historical Archive

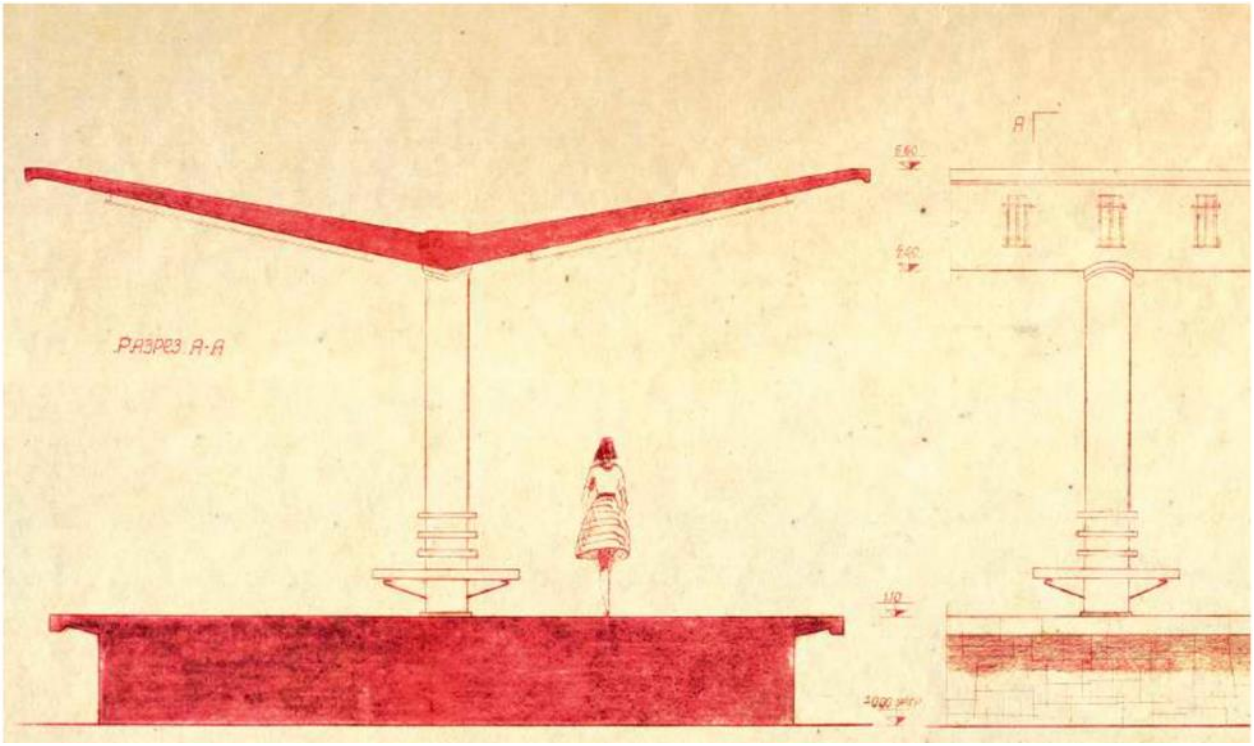



Fig.17. Station “Didube”. Sketch, 1962. Central Historical Archive

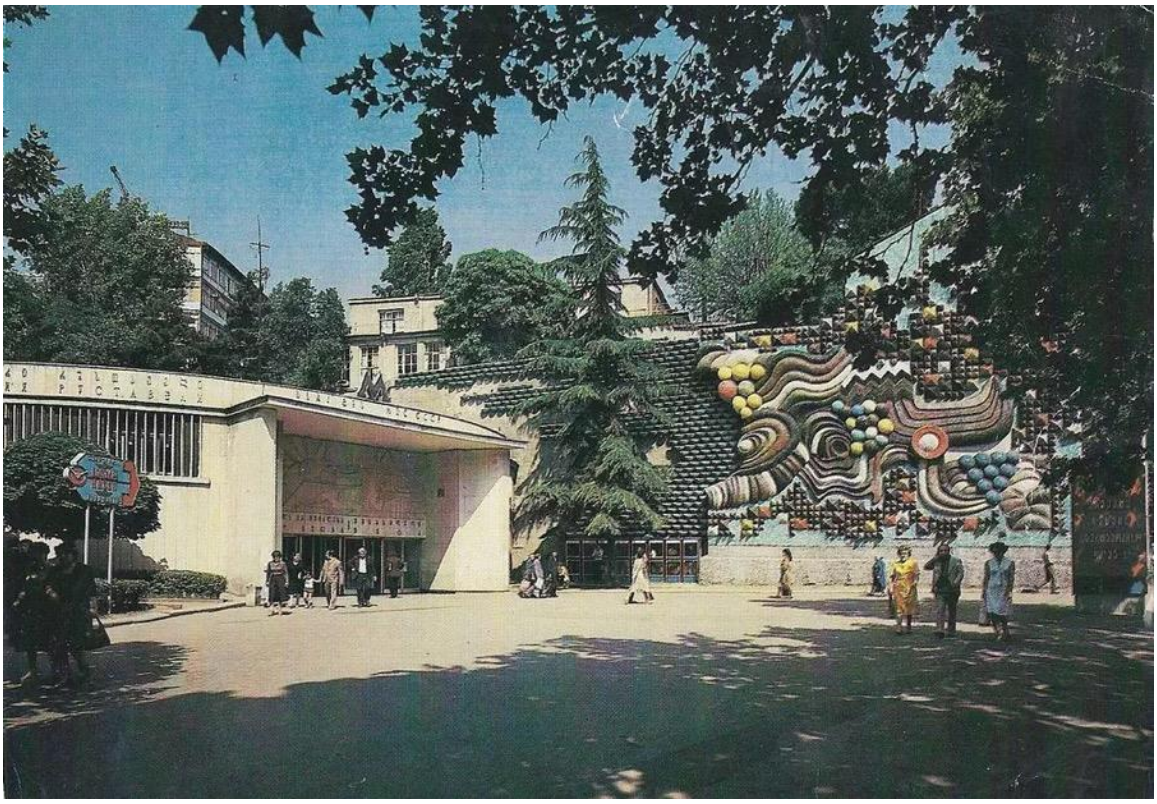


Fig.18. "Rustaveli" metro station, 1970s. Central Historical Archive

Fig.19. The interior of "Rustaveli" metro station, 1969. Central Historical Archive

Fig.20,21,22. Metro station “Oktomberi”. Central Historical Archive

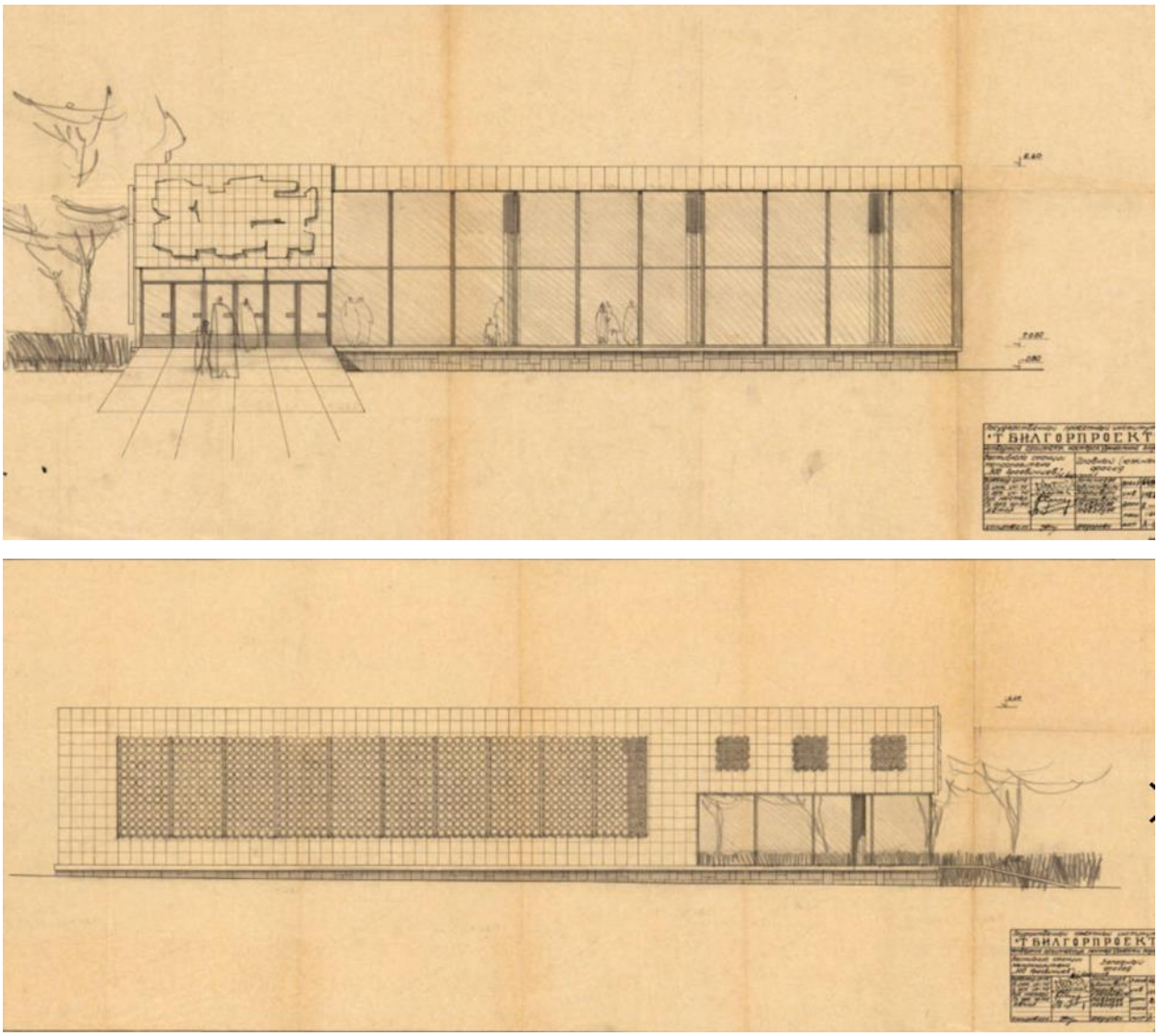


Fig.23.24. Metro station "300 Aragveli", 1966. Central Historical Archive

Fig.25. Metro station "300 Aragveli". Vestibule

Fig.26. Metro station “26 Komisari”. Central Historical Archive

Fig.27. Metro station “26 Komisari”. Central Historical Archive

Fig.28. Metro station “Isani”. Central Historical Archive

Fig.29. Station “Isani”. Central Historical Archive

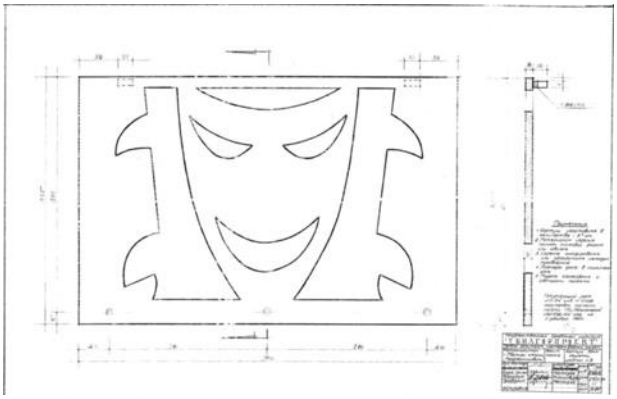


Fig.30,31,32. Station “Marjanishvili Square”. Central Historical Archive

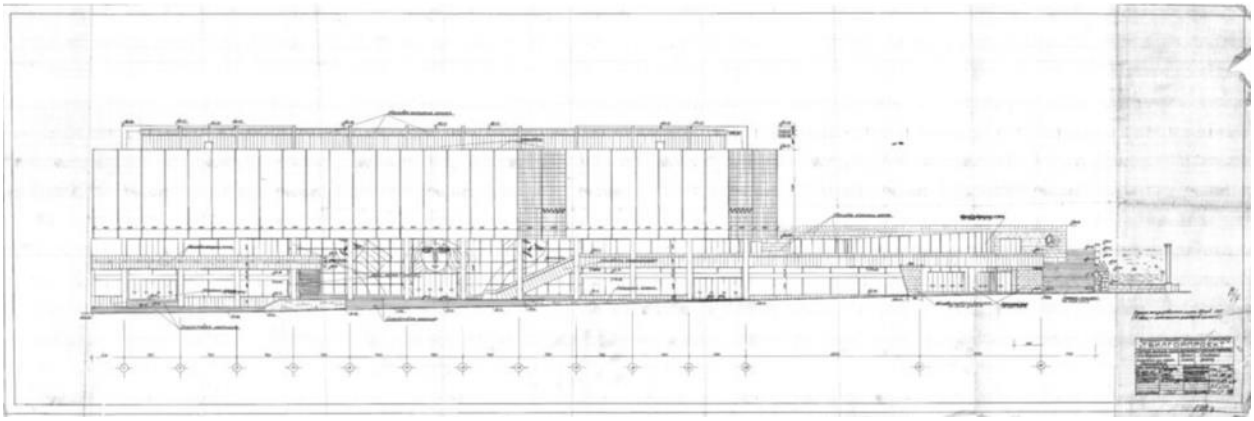


Fig. 33. Univermag Tbilisi Complex, 1971. Davit Morbedadze personal Archive

Fig.34. Metro station “Lenin Square”. Central Historical Archive

Fig.35. Station “Tsereteli Avenue”. Central Historical Archive

Fig.36. Metro station “Politeknikuri”. Central Historical Archive


Fig.37.38. Metro typeface. Author Shota Kuprashvili

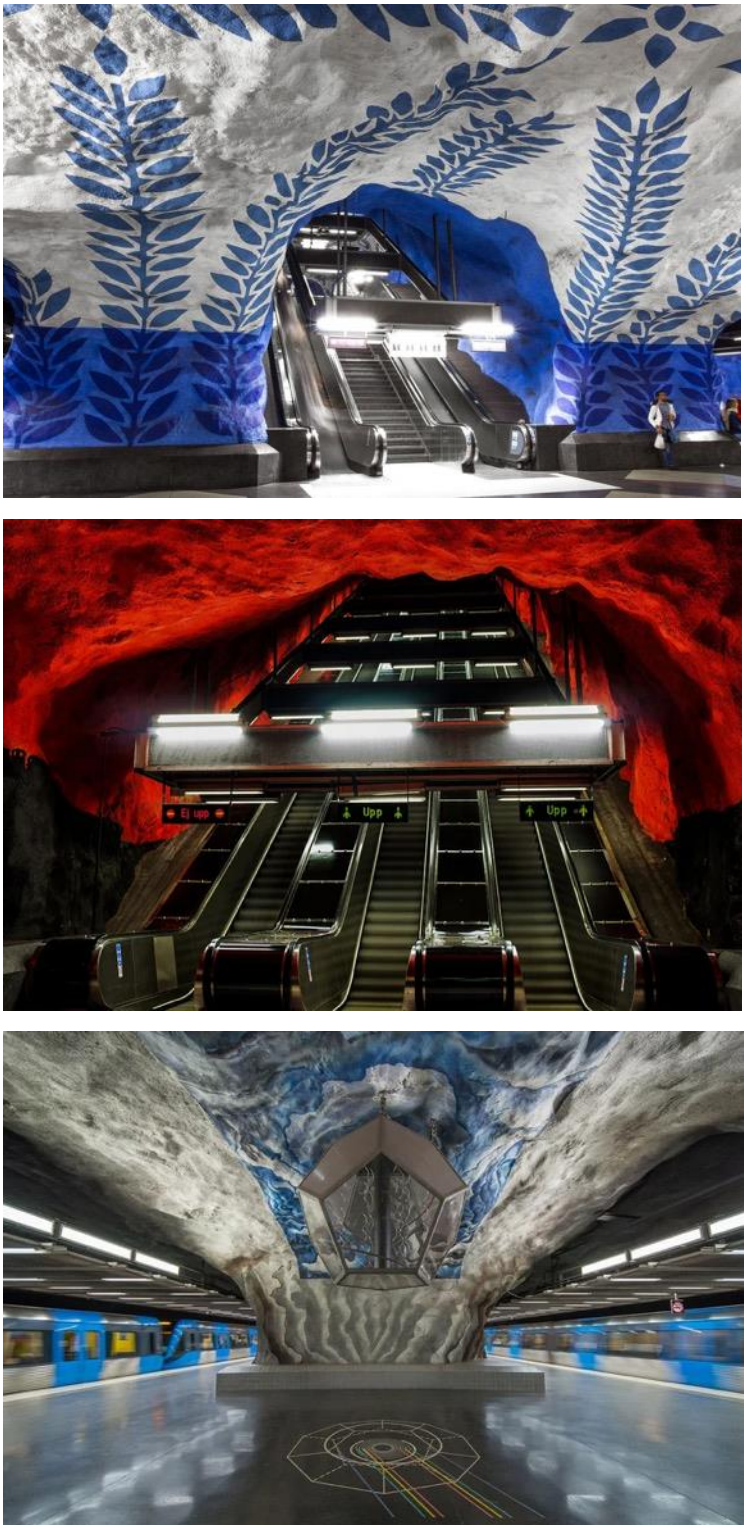



Fig.39.40.41. St. Stockholm, metro station vestibule

Fig.42.43. St. Naples. University Metro station

Literature and sources used:

https://www.da-vinci-inventions.com/ideal-city

https://www.onverticality.com/blog/past-cities-of-the-future

http://eng.antoniosantelia.org/pages/biografia

https://www.famous-architects.org/richard-neutra/

https://architectuul.com/architecture/radiant-city

The Moscow Underground of the Stalin Time (1934-1953). Aesthetic Features, Political Significance and Cultural Symbolism, Viktoriya Sukovata, Underground Architecture Revisited, ICOMOS 2019.

https://taa.net.ge/archive-geo/

https://teasblogi.wordpress.com/2020/03/21/თბილისის-მიწისქვეშეთი-მ/

https://forum.ge/?f=51&showtopic=34829946&st=0

https://tbilisi.gov.ge/news/11227

Giuseppe Pace and Renata Salvarani, Underground Built Heritage Valorisation, Roma 2021

Синтез искусств и архитектура обшественных здании. Москва. 1974Аралов Ю. Национальные традиции б архитектуре обшественных зданий. Цинтез искуццтб и архитектура обшественных здании. 1974.

Г. Голубев. Подземная Урбанистика. Москва 1979.

N. Janberidze, Georgian Soviet Architecture, 1971, Tbilisi

Jashi N. Socialist Tbilisi Architecture, Tbilisi, 1983, p. 66.

Gengiuri Nato, Architektur der U-Bahn-Stationen von Tbilisi – Vergangenheit und Gegenwart. In: Underground Architecture Revisited. ICOMOS Deutschland. Berlin. 2020.

N. Gengiuri, Tbilisi Metro Stations, 20th Century Architectural Heritage

St. Tbilisi Central Historical Archive and Fonds of Central Archive of Recent and Contemporary History Central Archive of Audio-Visual Documents

Special thanks to the head of "Urban Laboratory", Giorgi Babunashvili.