

Transportation Hub-Kumanovo

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Abstract

The modern way of life is conditioned by fast transportation. This in turn requires integration of many additional contents that opens the opportunity to the passengers for quick access to their target-food, accommodation, entertainment, communication.

The distance of the existing railway station (3.7 km from the city centre) makes it hardly accessible to the population, therefore it is neglected and the rail traffic in the city of Kumanovo is minimized. On the other hand the bus station has a good location, but the building is in poor condition, which impedes the functioning of the city and intercity bus service. Adjacent to the existing bus station, a segment of the railroad from the proposed "Corridor 8" transits, which opens the question of the importance of rail transport and its impact in the further development of the city. These considerations clearly indicate the need to establish an integrated transport hub, whose proposed location touches the downtown area, but is still in the zone between the city and the suburbia, which includes adjoining contents such as: retail, hospitality and culture, which will help achieve the goal of the transportation hub as a starting point of development of a new city nucleus, a new point in the city.

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Introduction

Phoenix-New born city of Skopje

After the earthquake in 1963, a new transport system was established in Skopje, capital city of Macedonia. United Nations were the initiators of reconstruction of the city therefore international team of experts were involved in the process together with the Skopje Town Planning Institute. The first phase of Master Plan carried out by Doxiadis Associates and local designing and enterprise companies were implemented by the end of August 1966. Master Plan was being realized on the field with new railway links, on new public buildings and on new residential neighborhoods.

City Gate Interchange

At the point where two highways come closest together is the City Gate Interchange. This interchange is a huge mechanism which controls many types of traffic, automobile, inter-city and

intracity bus, train, pedestrian. It was also planned to also perform the sequential transformation from high-speed to low-speed and from parking to pedestrian. This interchange was planned to be able to transform the higher speed two-way traffic into lower speed one-way traffic, and then connect this with the multi-level parking inside the rings or coordinate it with the existing street outside the mechanism (Figure 1) [1].



Figure 1: Master Plan Traffic System

Kenzo Tange's design project for Tokyo contains the principle of functional differentiation and therefore represents an example of defined structure

traffic system in relation to the operative closure. The main infrastructure traffic routes form the separate parts of the city with certain functions-processes. This Tange's utopian design project, unlike the conventional professional planning methods recognized in city planning, is characterized by a desire for social changes and acceptance of the emerging future tendencies developing the City (Figure 2) [2]. By 1980 the population was estimated to be 350.000. At that time Skopje was predicted to have large industrial communities and performs a more important role as the center of administration (Figure 3) [3].

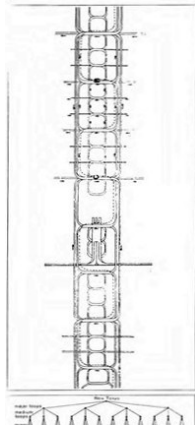


Figure 2: Tokyo Plan, Kenzo Tange

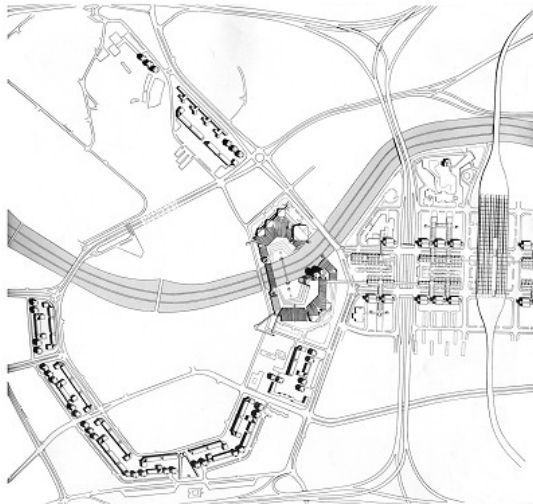


Figure 3: Kenzo Tange, City Center plan of Skopje

To encourage and assist in the natural linear development of the City to new east-west axis, a proposal was made that the new Central Station and railway line, planned by Skopje at this location will be placed underground, but from the final considerations it was decided to build it above ground.

The Transportation System

The transportation system of the new Skopje City Center was based on the concept of fusing human and vehicular activity organically into a three dimensional structure. The two collector roads from

new east-west axis should cross directly above the two highways which are below ground zero and run on the north and south on the neighboring Republic Square, City Gate Center and Transportation Center (Figure 4) [1]. The pedestrian routes were planned to be above ground connecting the Transportation Center with the City Center all a way through the City Gate Center. After final considerations with the STPT this three dimensional structure was abandoned and all the transport system was developed on one ground zero level. Only the Transportation Center was design according the plan, above the ground at 10, 50 m (Figure 5) [1].

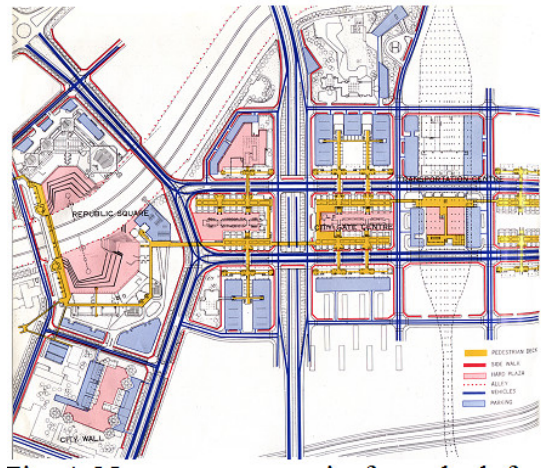


Figure 4: New east-west axis, from the left: City Wall, Republic Square, City Gate Center, Transportation Center, 1966

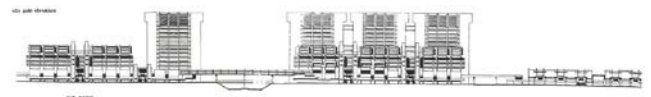


Figure 5: Part of the new axis, from the left: City Gate Center, City Interchange, Transportation Center, 1966

Transportation Center

In the competition plan, one of the functions of the City Gate Interchange was to supply a place for mutual interchange of all types of traffic. As we mentioned previously in the detail planning stage the Transportation Center became a single dimensional system connecting directly with the City Gate. The transportation functional elements in the Center included: The Skopje Central Railway Station, inter-town bus terminal, second post office, customs office, airport office, and other functions such as taxis, city busses, and parking lots.

Since the Skopje Central Station is estimate to handle daily 25.000 arriving and departing passengers and duration of some trains staying in the station for 30 minutes to an hour, the station should have three platforms in the first stage in the last stage five. The Station was also capable to handle international trains running from Paris to Athens and from Paris to Vienna to Rome.

Special notice in the space organization of movement line deserves the pedestrian deck integrated as a concourse bellows the train platforms.

Bus transportation from Skopje to other regions through-out Macedonia required a station for 20 buses and offices, dispatcher etc. as integrated part of Transportation Center. In addition to the central post office a second one was necessary for direct communication with the trains and the busses. Placed close to the post office the customs office was proposed for checking packages coming in the international trains. Luggage handling facilities such as the post office, the railway office and the custom office were proposed in different block from the passenger train and bus station on the opposite side from the collector street on the north (Figure 6) [1].

トランスポートセンター機能図

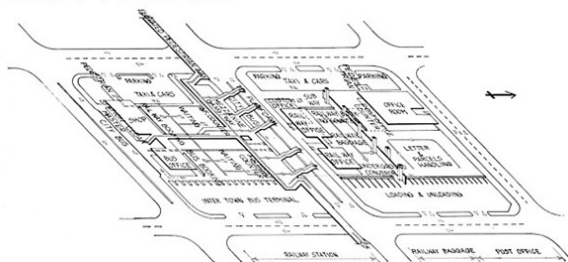


Figure 6: Circulation system of Transportation Center, 1966

We may conclude that this massive project proposal for the central area of city of Skopje, after the disasters earthquake was opportunity to remodel the city toward the new estimate developing of metropolitan area longitudinally from east to west. It is obvious that the key aspect in that process was defining the propulsive transportation system as integral part of historical fragments in the city. The key activity nodes such as City Wall, Republic Square, City Gate Center, and Transportation Center were intended to establish the public facilities as a basic structure for further developing the city of Skopje as capital of Macedonia.

Emerging of the Transportation hub as a new image of the city

The railway station as an activity node introduces the mobility metropolitan character in a city. What happens when this activity node on a greater level connects the city with other cities and states? The railway station has become more than infrastructure, it has changed the way of life and direction in which the city develops from the 19th century. The new railway station is not a barrier as it appears; on the contrary, it brings together the different parts of the city, becoming an activity node. It is not only a facility where passengers arrive and depart, it is an attractor, something that citizens identify with and aim in the Sunday walks. According to Kevin Lynch [4], railway lines are the dominant elements that form the image of the city and the best

way of observing and perception of the city, because they create sections through the city.

The physical expansion of cities is largely conditioned by the development of the railways. Increase of the length of railway lines allows the emergence of suburbs by facilitating transportation to city centers. The station appears as a necessary element in the city that becomes a hub of activities which adjusts urban development around it. The railway stations are becoming strategic places in the city or "nodes", as Kevin Lynch names them, which are intense focus points towards which the passenger moves. They are entities themselves, but operated by the city.



Figure 7: Trans - European Transport Corridors

New position of Kumanovo regarding Corridor VIII

After the fall of Berlin Wall, the project of "Trans-European Transport Corridors" has been emerged between the Europe and the Balkan countries (Figure 7). The main aim of the project was to make trade relations easier among the countries in the region and to develop ties on oil and other energy supplies, and telecommunication. Although, this was a complex infrastructure network, for Europe it had a strategic importance in the sense that these Corridors will also improve the stability in a region which has always been troubled [5]. Corridor 8 is one of the ten Trans-European corridors which are a link between Adriatic and Black Sea (Figure 8). In this matter the Corridor has huge significance for Macedonia from geo-political and geo-economical point of view.



Figure 8: „Rail Corridor VIII“-interconnection with other corridors

The current position of the train and bus station in the city of Kumanovo reflects the exact opposite of what buildings in the field of transportation are supposed to represent-connecting the city at regional and international level. The distance of the train station from the city center of 3.5 km, in a city which develops in diameter of 3 km without the surrounding neighborhoods, indicates the illogicality and the problem the city is facing with. The position of the city in relation to the borders of Macedonia, its position relative to the rail and road corridors, offers the possibility of creating an integrated transportation center that will be in the focus of hybrid processes and will meet the demands and needs of citizens of Kumanovo. New transportation hub will become a new gate for the passengers that transit daily or arrive in the city.

New transportation center Kumanovo

The implementation of the railway station in the city's everyday life has vital significance for a city like Kumanovo. With its location it has a tendency to become a major transit and trade center in Macedonia. Throughout history it is known that the creation of towns has always taken place on the crossroads of main roads by which goods and traders transited.

The project has a tendency of creating a new node that connects the core of the city with the largest settlement-Karposh, as well as reviving the Memorial ossuary located in the vicinity which has beautiful scenic views to the city, and raising the value of land in nearby settlement "Sredorek" which has an enviable location at the junction of two rivers that flow through the city (Figure 9).



Figure 9: Proposed Location

The proposed location for the new Transportation Hub is located in the north part of the city, 0.8 km from the center, near the Memorial Ossuary and the existing bus station, between the downtown area and suburb "Karposh". The transportation hub as an activity node should help connect the city with its suburbia, which now seems to be completely isolated. The site is defined by the river Lipkovka on South-East, and to North-East by the

newly proposed habitation which development should connect the suburbia to the city. On North-West the site is defined by Done Bozinov St.-an axial that spans from the city center through Karposh neighbourhood all the way to the highway connecting the country with Bulgaria. This highway is a part of the Corridor 8 as well as the railway line that goes through the location, which is the main reason for choosing the particular site.

The transportation hub, with the integration of diverse contents aims to meet the needs of different categories of users, grows into a transforming megastructure. This program integrated concept with disparate programs should provide transportation; shopping; accommodation; public services; rent a car; restaurants; bars; cafes etc.

The architectural concept integrates rail, bus and city traffic that directly affect the creation of the railway station of the 21st century, the so-called transportation hub. There are also other types of contents similar in nature and complementary with the main function.

Architectural Concept

The concept in ground floor is a metaphorical analogy to the fragments of the city. Three independent volumes (Figure 10) representing the three points in the city: downtown, memorial ossuary and Karposh as independent entities, fragments of the city.

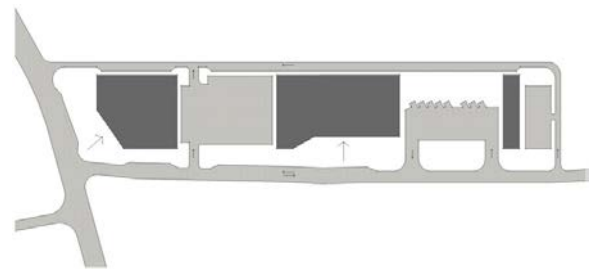


Figure 10: Diagram of volumes, ground level

The volumes are cut out in order to create plateaus in front of the main entrances, forming open public spaces. A bus stop is located below the platforms in front of the shopping center which has position exposed on the main street to attract passersby.

The parking lot for visitors is located between the first and second volume, which evolves at three levels, separating the content in ground floor. Taxi stands and parking for short stays are provided on the street, parallel along the entire length of the building. There is an additional parking lot for staff at the North-East end of the building.

The mezzanine floor has a single volume with a broken line/shape, a metaphorical analogy to the project itself or more precisely its significance in linking various, seemingly unconnected parts of the city. The broken line on the floor represents the promenade that now this hub brings to the city, a reason to walk, shortening the distances, connecting the city (Figure 11).

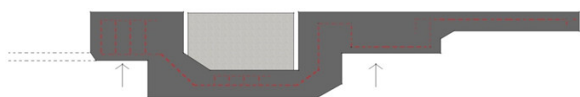


Figure 11: Diagram of volumes, mezzanine

The parts over the entrances are indrawn, creating double height volumes, which underlines their position. This is related to the idea of a promenade that this floor offers, connecting individual contents, by which users are offered with various scenarios, a look to what is happening on the ground floor, an overlook to the city (Figure 12).

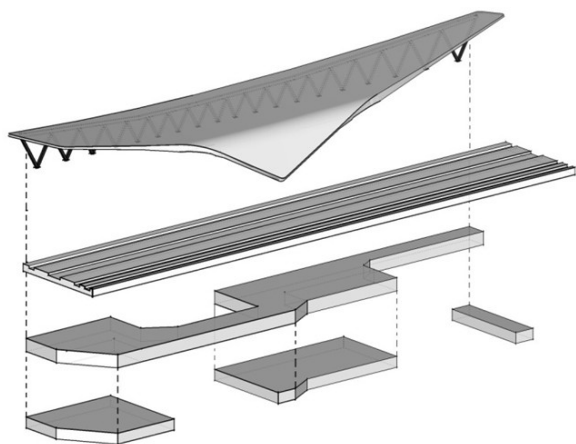


Figure 12: Exploded axonometric view of volumes

On a greater level, the building through this floor could communicate directly with the Memorial. This connection of the floor with a sort of a gangway with important points in the city is noticeable in other examples of buildings of this nature.

Such is the case with the project for the Transportation Center in Skopje and the idea of the architect Kenzo Tange for its direct connection to the City Center through gangway with considerable length and begins at the Transportation Center concourse, so the passengers should be able to walk to the commercial or the city center without them having to set foot on the street level.

The roof connects the building in a new, unique integrity. With its monumentality it represents the idea of the building itself-what the city needs is a functional solution which will be a new point and attractor for the citizens.

Program

The program in the building is distributed on three levels. The Ground floor level is consisted of three volumes and each one of them embeds different and disparate functions (Figure 13).



Figure 13: Ground floor level, ± 0.00

The first volume has commercial use. The commercial units are situated linearly along the longer side of the volume. The main entrance for the visitors is from the corner on the main street and the street that goes along the building and it is emphasized so it attracts the visitors. Another entrance is directly from the parking and the employee entrance is located at the rear and goes directly into the employees' facilities. The entrance hall has double height and from there you access the commercial units and the stairs that take you on the First floor.

The parking lot is situated between the first and second volume, and it extends on three levels.

The second volume is in the middle of the building and it houses the main contents of the rail and bus station. The entrance is indrawn so that in front of it a plateau wide 18m is created, from which 9m are covered. The entrance vestibule has double height and large cubature because of the huge frequency of people/passengers is accessible from the plateau on the front and from the parking lot. The whole volume is an open space which embeds all the contents. The ticket offices and the information desk are positioned in line with the main entrance so the passengers can orient easy. The stairs, escalators and elevators that lead to the distribution floor and the platforms are positioned on both sides from the ticket offices. The main waiting room for 250 passengers, the waiting room for parents with children, luggage desk, tourist agencies, exchange offices, small shops, toilets and a café-bar which opens to the plateau are all located in this volume.

Between the second and third volume is the bus platform. The buses circulate in one direction with separate entrance and exit. There is also a bus station waiting room which is flexible; it can be either open or closed. This waiting room is with controlled entrance and exit, with capacity of 150 passengers. There is additional waiting room for 50 passengers on the platforms.

The third volume on the Ground level has the smallest surface and it embodies the heavy luggage department which has its own depot and elevators. This volume is a service core to the building, through

which the employees have access to the Mezzanine floor (administration).

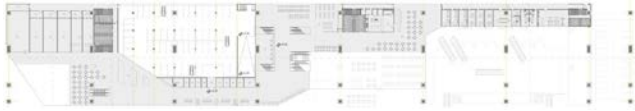


Figure 14: Mezzanine floor, + 5.10

The mezzanine floor is a unique volume which integrates the three separate volumes at the ground floor (Figure 14). Above the first volume from the ground floor, the contents repeat and part of the commercial units transform into food court. The bridge connecting the building in the parking zone, despite the function to connect, it contains commercial units like: souvenir shop, snacks, newspapers etc. In the middle is the distribution floor which is the connection between the ground floor and the platforms, and also an open bar, a café-bookstore which offers the passengers alternative ways of waiting, waiting rooms and an info desk.

The administration is situated above the bus waiting room on the ground floor. The offices are put linearly with views to the bus platforms.

The train platforms are on the second floor. Two double platforms, 10.5 m wide accommodate the four lines with 205 m length. There is also a fifth line which is transit only.

Structure and Materiality

The building is consisted of main/primary, secondary and roof structure. The main structure supports the railway lines/platforms, while the secondary structure supports the floor construction on which the first floor is placed. The roof structure is "independent" from the building. It is a spatial truss with a variable height, which supports on a steel truss in the rear zone, while in the front it lowers to the

street level, and it's fixed to a reinforced concrete foundation (Figure 15).

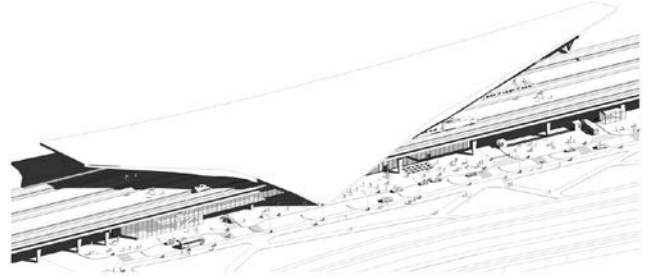


Figure 15: Structure and Materiality of the program

The complexity of the program generates the complexity and extensiveness of the building itself, so the materiality and diversity in the shaping of the building are in second plan.

The whole building is covered in glass which is divided with steel frames in dark color. The columns are untreated and clearly show the use of concrete in their construction. The roof is covered with panels in bright color, which contrasts the dark volume of the building. With simple shaping and materiality, the significance is given to the structural boldness of the building and its form, as a new point in the city.

References

1. Kenzo Tange, Skopje urban plan, The Japan Architect, No. 130. 1967, 30-69.
2. A City is not a Tree, London, Design No. 206, 1966; 7
3. Skopje Resurgent, New York: United Nations, 1970; 331
4. Kevin Lynch. Image of the City, 1960
5. Vatansever, Muzaffer. 2008. "The Corridor VIII Project: Albania and Macedonia" The Journal of TurkishWeekly, (November)