

Reconfiguration of the road and the pedestrian traffic in the central area of the Municipality of Alexandria - Road passageway

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Abstract

Road Passageway / Passage

Any locality , especially a county seat municipality, needs a representative area, the so-called „ Centre ” that the tourists and the foreigners would want to visit, the locals to enjoy it and take pride of.

Amongst the most important landmarks of the residents of the Municipality of Alexandria are the green areas, which is why the project conceived by the Municipality supports the importance of developing the network of urban spaces in the city. The city has a regular street formation and a system of distribution that appears most often in colonies cities. Therefore, the Danube street with its green area for recreation which cuts the monotony situated exactly in the centre of the city, is “ the green heart of the city”.

General objectives of the project: *Improving the accessibility of both locals and tourists in the city centre of Municipality of Alexandria with the help of the underground road passages. Reconfiguring the subterranean spaces related to the central area of the municipality, thus improving the quality of the public space. Reducing traffic congestion to the surface in the central area and supporting both locals and visitors by providing parking in this area. This is achievable, by using an underground parking for the underground passage, proposed by the project, thus clearing up a significant number of square meters of the above- ground space, usually occupied by vehicles.*

The project ‘Reconfiguration of the road and the pedestrian traffic in the central area of the Municipality of Alexandria– Road Passageway’ is part

of the general context of sustainable development, economic and social, in the regional, county and local policies and programs. It is relevant from the point of view of community strategies aimed at optimizing local development factors- environmental actors on the one hand and tourism infrastructure on the other.

Keywords: *community strategy, sustainable development, tourism infrastructure, green area, development of urban space networks.*

1. Introduction

1.1. Defining the territory and the accessibility

The Municipality of Alexandria is the residence of Teleorman county and the main economic-social centre of the county with complex industrial, tertiary, administrative, political, educational and cultural functions.

Due to its location, the city of Alexandria has been and continues to be a hub for communication. It makes the connection between the capital of the country, Bucharest and many of the provincial cities.

The National Road DN 6 connects Bucharest through Alexandria to Roşiorii de Vede, Caracal, Craiova, Timișoara;

The National Road DN 52 connects Alexandria to Turnu Măgurele, Corabia, Calafat etc.;

The National Road DN 51 connects Alexandria to Zimnicea;

The County Road DJ 504 connects Alexandria to Pitești and Câmpulung;

The County Road DJ 601 connects Alexandria, through Găești, to Târgoviște;

The County Road DJ 506 make the connection through Alexandria and Giurgiu.

Located in the south of the Romanian Plain, on the right side of the Vedea river, the Municipality of Alexandria is 89 km away from the country's capital, Bucharest.

The Municipality of Alexandria has an area of 98,46 km² and a population ,based on the place of residence on 1st January, 2016 of 52.101 residents, according to the statistical data presented by the National Institute of Statistics in the Tempo-Online Database.

In terms of land use, 74,92% represents arable land, 3,27% grassland, 2,98% forest, 0,9% water and ponds, 2,60% degraded land, 10,88% construction , 2,45% communication lines.

Most of the public institutions of general interest and points of attraction are concentrated on the street Danube, the main thoroughfare crossing the municipality, and the residential areas, consisting of block neighbourhoods and house neighbourhoods, are located on a rectangular **street plot**.

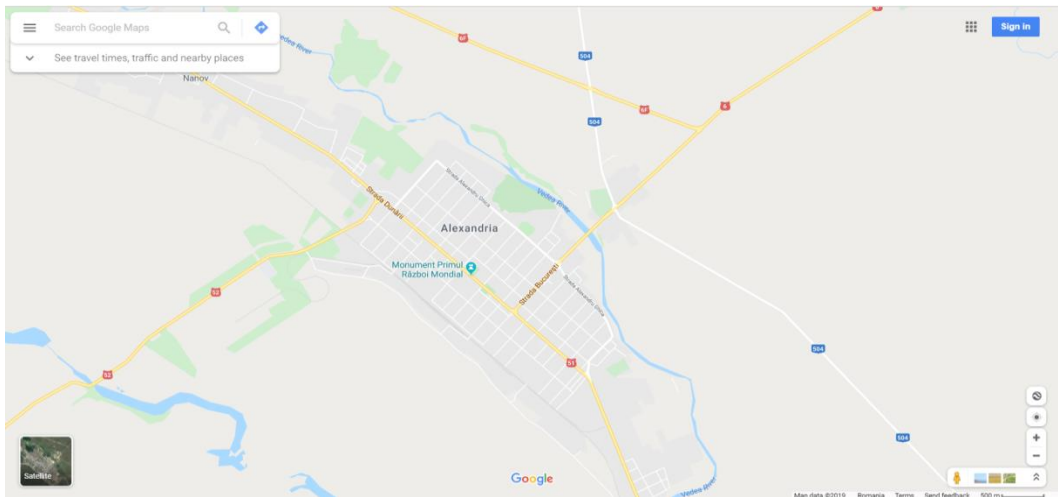


Figure 1. Alexandria municipality - accessibility
Source: <https://www.google.com/maps>

1.2. General information about the project

The perimeter in which the location of the investment is located concentrates the headquarters of the most important public, financial, cultural and commercial institutions and presents a good service with public spaces through the existence of a network consisting of parks, squares and markets connected, partly, through pedestrian areas.

Focusing on the idea that green spaces play an important role, contributing to the quality improvement of the residents' life, **the Municipality of Alexandria's Mayor, Mr. Victor Drăgușin**, requested the current project. Its general objective is to improve the accessibility of cars and pedestrians, local and transit traffic through an underground roadway. That will result in an increase of the city centre's attractiveness.

Tourism increasingly involves modifying the natural and artificial environment and demands a special territory equipment, and the development of specific spaces and functions.

Achieving the objective of the present project is important for promoting the tourism in the Municipality of Alexandria. Any investment that increases the attractiveness of the public spaces and improves the urban image, will have a positive impact on the development of tourism.

The area involved in this project is delimited by the following landmarks: the Danube Street, the section delimited by the intersection with Bucharest Street and Ion Creangă Street and the pedestrian area related to the section described above and up to Liberty Street. The limits of the project are the following: Danube Street between the intersection with Ion Creangă Street and Bucharest street, Liberty Street between Ion Creangă Street and Bucharest Street, Ion Creanga Street and Bucharest Street.



Figure 2. Decongestion of road traffic and the creation of a green, pedestrian area, suitable for relaxation

Source: Feasibility study for "Reconfiguration of the road and the pedestrian traffic in the central area of Alexandria-Pasaj Rutier", elaborated by S.C. SPECIALISTCONSULTING S.R.L., August 2014

The land related to the works provided for in the project is located in Alexandria municipality, Teleorman County and is delimited by the following landmarks: Dunarii Street, the section delimited by the intersection with Bucharest Street and Ion Creangă Street and the pedestrian area related to the section described above and up to Libertății Street. The limits of the project are the following: Dunarii street between the intersection with Ion Creangă street and Bucharest street, Libertății street between Ion Creangă street and București street, Ion Creangă street and Bucharest street.

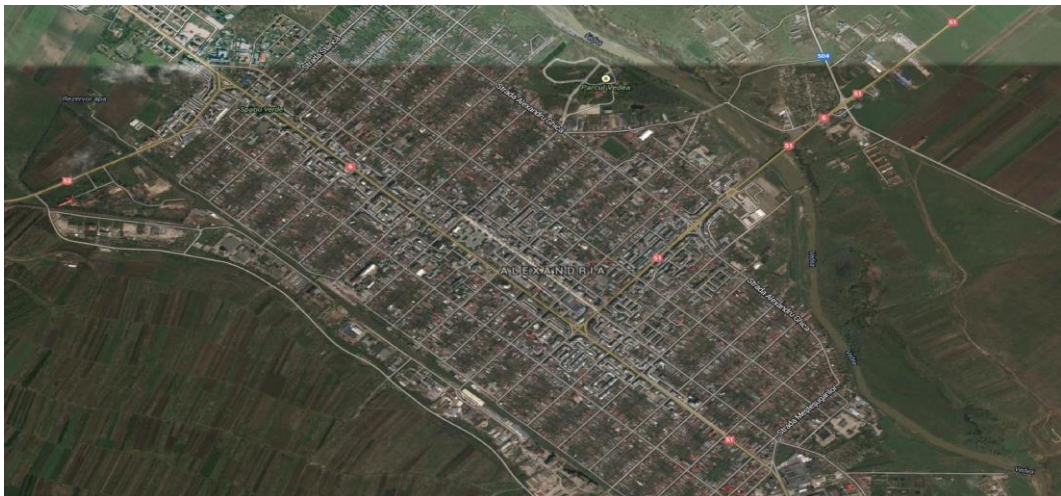


Figure 2. Plan for framing the area studied by the project

Source: <https://www.google.com/maps>

The project aims to implement solutions regarding:

- parking arrangements in the proposed location, modern share-space and pedestrian solutions;
- the creation of an infrastructure necessary for the transit of pedestrians and cyclists between the areas of interest in the central area and the connection between the traffic lines of the urban public transport;
- providing the necessary facilities for pedestrian traffic as well as those involved in traffic with special needs, evaluating the environmental impact factors and adopting technically and economically feasible solutions to avoid the negative impact;
- adopting solutions that allow inspection and maintenance as well as fixing the objective with minimal expenses;
- framing the landscape objective in the studied area;
- diversification of activities in the social sphere of the locals by organizing different functions; **"greening"** the central area of the municipality in the idea of replacing every square meter of space built with green spaces as much as possible.

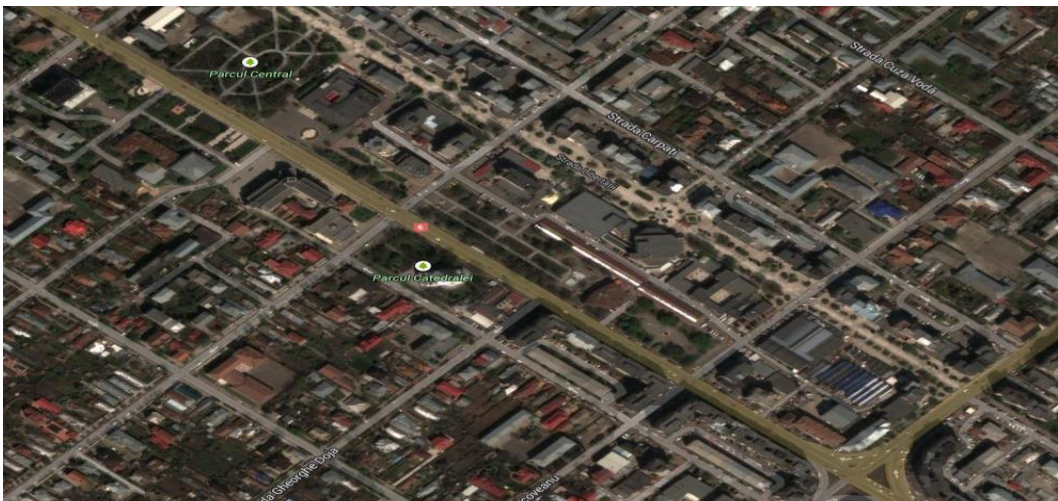


Figure 3. Situation plan of the objective studied through the project

Source: <https://www.google.ro/maps>

In the context of the **"greening"** of the central area, we aimed to redevelop the central park, an investment that is intended to have a recreational, educational and aesthetic impact.

It will bring a contribution to the quality of the environment and implicitly the quality of life of the residents. At the same time our aim is to create an attractive place for residents and people in transit.

The constructions proposed within the park are generally places intended for spending leisure time but also for carrying out socio-cultural activities.

The proposed intervention works will consist of: infrastructure works, building fountains, enlarging and diversifying the areas of green space through the placement of flower boxes and support gardens (local species will be planted and very well adapted to the climatic environment in the plains area), steps and ramps for the access of people with disabilities, pergolas, various urban furniture, ornamental lighting, underground sewers for new installations as well as for telephone networks, existing cable, arrangement of living areas through the placement of smart banks (equipped with USB sockets, intelligent systems and autonomous), etc.

The project is part of the general context of sustainable development, economic-social, regional policies and programs. While being relevant in terms of community strategies, it aims to optimise the local development.

To increase the image of the Municipality of Alexandria as a tourism attraction, it is important to achieve the objectives of this project. Until now, it did not reach its fully potential. Any investments that increases the attractiveness of public spaces will have a positive impact on tourism.

The proposed project preserves the urbanistic old configuration of the city centre, while essentially improving the functional character of the area.

1.3. The current situation and information about the entity responsible for this project implementation

The development of the transport infrastructure represents a necessary condition for the successful implementation of the other development priorities of Teleorman county, contributing to the increase of the mobility of people and goods, to the integration of the area with the trans-European transport network, to combating the isolation of the underdeveloped areas and, last but not least, the development of regional and local transport infrastructure. An efficient transport infrastructure, connected to the European transport network contributes to increasing economic competitiveness, facilitates integration into the European economy and allows the development of new activities on the internal market.

The project proposes a modern and sustainable road and bridge infrastructure development due to the increase of vehicles purchased, the increase of the mobility index of the existing fleet, the increase of the traffic passing through Teleorman county, the increase of the pollution, lack of signalisations for protected areas, tourist areas and cultural heritage, natural and historical areas.

All three dimensions of the concept of sustainable development, the ecological, economic and social dimension are addressed in the elaboration of the study. The ecological dimension concerns consumption and sustainable production, conservation and management of natural resources, climate change and clean energy.

The economic dimension refers to socio-economic development (economic prosperity) and sustainable transport. The social dimension concerns social inclusion, demographic changes and public health.

In this regard, the study aims to developing the road infrastructure in Teleorman County while meeting the economic, social and environmental needs of the population. The desired outcome is to minimize its impact and identify opportunities and possibilities for development, while taking into account the sustainable component.

The existing situation of the analyzed park resulted from the cadastral documentation and the surveys drawn up at the time of elaboration of the present technical-economic documentation. The land on which the park is located is placed in the inner city, in the centre of the Municipality of Alexandria. This area has polarized and continues to polarize the entire leisure activities and cultural events.

2. Description of the investment

2.1. The need for investment

The need for this study arose from the decision of the City Hall of the Municipality of Alexandria to continue the program of modernizing the urban infrastructure.

The project proposed for the study envisages the construction of an underground road passage along the Danube Street. In order to substitute the parking space, two independent for each other underground parking lots were provided, on one side and on the other of the passage.

The explosive development of the Municipality of Alexandria fleet (car park) obliges the local authorities to find viable solutions for the development of the number of parking places. The problem with the number of parking places does not belong only to the central area but also to other neighborhoods with agglomerations of housing units or commercial areas. The largest agglomeration is in the central area, the target of all the residents of the municipality and not only. The development of a pedestrian area in the area targeted by the project constitutes not only a need arising from the application of the other objectives but also an opportunity to raise the quality standard of the public space.

2.2. Development directions - framing the project in the Local Development Strategy 2014-2023, Part I

The urban development, the modernization of the infrastructure and the protection of the environment in the city of Alexandria follows the updating of the General Urban Plan of the Municipality of Alexandria:

- outlining, organizing and developing the peri-urban area;
- the reevaluation of urban areas, of the urban and extra-urban space (general and area urbanization plans) in the perspective of the development of the habitat and of the areas of economic activity and in other areas;
- the reassessment of the general architectural profile of the municipality: central area, neighbourhoods, green spaces, spaces for public utilities (water, waste water, transport, waste, etc.), spaces for various activities;

- the reassessment of spaces bordering administrative boundaries in view of creating new areas with economic, residential and leisure functionality;
- the adequate protection of the natural and ecological capital of the area;
- improving the selected collection and ecological storage of household waste;
- the rehabilitation of the water and sewerage networks in Alexandria municipality and its extension so as to ensure water supply and access to the sewerage network of all inhabitants;
- modernizing the road network, pedestrian areas, bypass routes;
- increasing traffic safety by expanding video monitoring of road traffic and decongesting the central area by constructing underground car parks;
- ensuring the mobility of the population in the municipality and to the localities in the periurban area;
- ensuring efficient management of transport and mobility;
- promoting public transport and alternative means of transport;
- providing sufficient parking spaces and arranging bicycle lanes;
- increasing the degree of safety and security on public roads;
- improving the quality of life of the population by reducing pollutant emissions generated by road traffic;
- reducing fuel consumption and using alternative energy sources;
- ensuring the civilized living conditions by extending the natural gas supply networks in all the districts of the municipality and extending the network to the Alexandria Industrial Park - Vitănești Commune - Măgura Commune;
- urban regeneration of central and peripheral areas through the modernization of sidewalks, pedestrian traffic spaces, by making parking lots and offering a modern traffic solution;
- landscaping and dendrological rehabilitation of Vedea Forest;
- setting up of protective curtains;
- rehabilitation and consolidation of the protection dam of the Vedea River and the arrangement of the Vedea park and lake;
- improving the conditions of leisure and increasing the degree of safety by creating and modernizing children's playgrounds and their video surveillance;
- improving recreational and environmental conditions by redesigning parks and green spaces;
- providing living spaces for both young people, specialists and people with social problems;
- improving the educational infrastructure in kindergartens, schools and high schools in order to increase the performance and development of the educational act;
- the initiate programs to support gifted children;
- building a school campus with all the facilities;
- the improvement of the sports infrastructure in order to increase the performances and competitiveness at municipal and national level;

- the improvement of health services in Municipality of Alexandria (maternity, ambulance service, morgue and stem cell and transfusion collection center);
- offering alternatives for the care of elderly people in difficulty by setting up a specialized center and setting up a palliative care center;
- the establishment of a new cemetery;
- improving the conditions of civilization by equipping the city with urban furniture;
- the setting up of special places for recreation within the premises of the blocks;
- the modernization of the Municipality of Alexandria Culture House and the Patria Cinematographer;
- the establishment of a municipal cultural center.

2.3. Development Policies of the Municipality of Alexandria - framing the project in the Policy for the development of local infrastructure (public services)

2.3.1. Strategic priority: The development of public services

2.3.1.1. Development measures of the Municipality of Alexandria

The development measures consist in:

- the rehabilitation and modernization of the road network and the pedestrian alleys;
- the rehabilitation of degraded urban infrastructure and improvement of urban services;
- the development of infrastructure and utilities for new individual and collective housing neighbourhoods;
- renovating unused spaces and preparing them for new activities;
- the thermal rehabilitation of public buildings;
- the development and rehabilitation of public infrastructure and utilities;
- modernizing and extending the local public transport service and ensuring efficient mobility management;
- promoting public transport and alternative means of transport;
- creating sufficient parking spaces and arranging bicycle lanes;
- improving the quality of life of the population by reducing pollutant emissions generated by road traffic;
- increasing the degree of safety and security for public roads;
- the development of appropriate waste management systems - selective collection, recycling;
- the rehabilitation and consolidation of the protection dam for the Vede River and the arrangement of the settlement area;
- environmental protection;
- the implementation of renewable energy use projects;
- vocational training in the field of sustainable energy of the personnel of the local administration, identification and development of alternative solutions regarding the production of energy in order to reduce the expenses with the public lighting network;

- the rehabilitation, extension and modernization of the rainwater network;
- the replacement of the drinking water transport and distribution network;
- the introduction of the cable network underground;
- the concession of the care service of dogs without an owner;
- the establishment of sanitary groups in the municipality;
- the rehabilitation of existing cemeteries and establishment of a new one;
- the construction of mortuary chapels within the churches;
- the construction of utility airport (emergency, SMURD, agriculture, etc.);
- the arrangement of the central area of the city in such a way as to combine the commercial functions with the civic, cultural, leisure and tourist functions.

2.3.2. Policies to improve local transport infrastructure

2.3.2.1. Strategic priority: Development of transport infrastructure

2.3.2.2. Development measures

Development measures consist in promoting sustainable economic development and mobility of the population and labor force of the area and in increasing the degree of accessibility and attractiveness by:

- improving the transport infrastructure;
- the rehabilitation and modernization of the road network;
- the video reconfiguration and monitoring of road traffic - extension;
- improving the road traffic system;
- the extension of parking spaces;
- making the bypass variant and building a bridge over the river Vedea between DJ 504 and DJ 51;
- setting up of indicators at the entrances of the municipality to the main public institutions and objectives;
- improving the public transport system by introducing electric transport;
- reconfiguring the traffic in the central area by introducing it into the underground - underpass road.

2.4. Proposed scenarios - the criteria taken into account when drawing up the decision matrix

2.4.1. Scenario 1 - Execution of the infrastructure of the lower passage, from slurry walls / molded walls;

2.4.2. Scenario 2 - Execution of the infrastructure of the lower passage, pile cages;

When establishing the optimal solution, a decision matrix was developed that would highlight the main advantages and disadvantages of each scenario.

The criteria that were taken into account when drawing up the decision matrix are the following: solving the problems of strength and stability of the

structure, the execution time, the risk and complexity of the technology, maintenance costs and the cost of the basic investment.

In both scenarios, the problems of strength and stability of the structure - the main elements that contribute to the choice of the optimal technical solution for the realization of the lower passage, are in the long term fully solved.

The execution time takes into account the type of infrastructure executed. Since the studied scenarios for the execution of the passage are technologically different, there will be different execution times.

In the case of scenario 1, the passage being executed from slurry walls/molded walls, the execution rate is approx. 14 m / day of work, while for the passage executed in the solution with pile/cages/ ridged pilots, the execution rate is approx. 88 * pilots / day = 4,80 m / working day.

From the calculations made above, it is obvious that in scenario 1 the execution time is much shorter than in scenario 2. In view of the presented scenarios, it was appreciated that 35 days are needed for the execution of the infrastructures in scenario 1, while for the scenario 2, 103 days. The criterion regarding the risk and the complexity of the technology was chosen because it reflects best the risk assumed by the Constructor and the Designer during the achievement of the objective according to the execution details. In the case of scenario 1, the passage being executed in solution slurry walls, the complexity and the risk are obviously lower than in scenario 2, because the safety measures (guide beam) and the used equipment can be taken, reducing the risk of deviation from the project. In the case of scenario 2, the passage being executed in the solution of pile cages / forged pilots, the complexity is higher than in scenario 1, because the probability of missing a pilot's execution is much higher than the probability of missing a slurry wall/molded wall panel. Another very important risk is obtaining a poorer quality in terms of the strength of the structure.

The maintenance costs will vary depending on the scenario chosen. For this criterion, the only cost category different from one scenario to another is the maintenance of the waterproofing of the passage. Due to the fact that in scenario 2 through the adopted technology additional waterproofing measures must be taken, the maintenance cost for this category will be higher than in scenario 1. The cost of the basic investment best reflects the investment effort, while giving the technical difficulty of each scenario studied.

Table 1. Weight of the criteria in the decision-making matrix - analysis of the importance of each criterion in relation to the others

Criterion	Degree of importance	Weight criterion
Strength and stability	3	30%
Execution time	0,5	5%
Risk and complexity	4	40%
Maintenance costs	0,5	5%
The cost of the basic investment	2	20
Total	10	100%

Table 2. The decision matrix

Criterion	Weight criterion	Scenario 1		Scenario 2	
		Execution of the infrastructure of the lower passage of slurry walls		Execution of the infrastructure of the lower passage of pile cages	
Strength and stability	20%	100	20	100	20
Execution time	5%	100	5	34	1,7
Risk and complexity	40%	80	32	60	24
Maintenance costs	5%	80	4	60	3
The cost of the basic investment	30%	100	30	70	21
Total	100%		91		69,7

Source: Feasibility study for "Reconfiguration of road and pedestrian traffic in the central area of Alexandria- Road Passage"

2.5. The scenario recommended by the developer

According to the decision matrix, the best score is assigned to *scenario 1 - the execution of the lower passage infrastructure, from slurry walls / mule walls.*

2.6. *The advantages of the recommended scenario* consist of the costs of the basic investment, much lower than in scenario 2; the execution time of the investment, much shorter; works quality - superior;

2.7. *The disadvantages of the recommended scenario:* providing a larger work front; precise synchronization between the excavating machine and the supply with the material resources (reinforcement and concrete).

2.8. *The main characteristics of the constructions within the investment objective, specific to the field of activity and the constructive variants for the realization of the investment, with the recommendation of the optimum variant for approval - recommended scenario;*

2.8.1. The underground road crossing

The topographic, geotechnical and environmental studies were based on the design of the resistance structure, which, together with the technical standards and regulations in force, led to an optimal solution.

All the geometrical elements of the objective have been established to comply with the standards and legislation in force, as well as according to the legal situation of the land.

2.8.1.1. The route in plan

The lower passage is between T. Vladimirescu street and C-tin Brancoveanu street, and has a total length of 660.0 m, of which 288.28 m represents the length of the actual passage (the covered area), 183.45 m represents the length of the ramp T. Vladimirescu, and 188.27 m represents the length of the C-tin Brâncoveanu ramp.

The path of the passage is presented in the form of alignments connected with fragments.

2.8.1.2. The passage itself

In the transverse direction, the passage will have a rectangular section, with two lanes on sense of 3.50 m each and two technological sidewalks of 55 cm each. The road side is provided with 2.0% transverse slopes to the sidewalk.

The layout of the vertical passage will be 5.00 m, which allows the circulation of all categories of vehicles.

In the middle area of the passage, decelerating / accelerating lanes will be arranged to ensure the entry / exit of the underground car parking. Because the underground parking is located on both the left and right sides of the passage, the decelerator / accelerator bands are also made on both sides, with a width of 3.00 m each.

The delimitation of the decelerating / accelerating lanes on the current part of the road will be done by the execution of a separating island with a width of 1.60 m and road markings. Along the separating island will be realized intermediate supports of the upper plate. The intermediate supports will be made of piles with a diameter of 600 mm and will be finished by applying an aluminum plate facade. Throughout the length of the decelerator / accelerator bands, the sidewalk will be 50 cm wide. The sidewalks will be provided with two PVC pipes, embedded inside.

The strength structure of the covered area will be composed of two rows of slurry walls / molded walls arranged parallel, grooved and the top plate.

The slurry walls / molded walls will be made of reinforced concrete with a thickness of 60 cm. At the bottom, the walls will be solidified by means of a monolithic reinforced concrete slab, and at the top of a plate made of both prefabricated beams with adherent strings solidified by means of the overlay plate and reinforced concrete monolith.

The waterproofing of the covered area will be carried out by the execution of a modern waterproofing on the outside of the overlay plate and by the construction of a reinforced concrete screen with a thickness of 20 cm, in front of the slurry walls / molded walls. The screen has the role of waterproofing the structure, especially by using a special concrete and treating each joint with special strips.

The width of the underground passage is variable, between 17,20 m (0,50x2 + 3,50x2 + 1,60x2 + 3,00x2) ... 8,10 m (0,55x2 + 3,50). Through the passage will be able to circulate all the vehicles with a height of up to 5,00 m.

2.8.1.3. Access ramps

The structure of the access ramps, will be composed of slurry walls / molded walls made of reinforced concrete with a thickness of 60 cm, Ø400 mm pile cages / cut piles and support walls. The solidification at the bottom of the support structure will be done by means of a monolithic reinforced concrete slab, and at the top it will be achieved by means of the crown beam.

In the cross-section, the ramp will provide the gauge for two lanes having a width of 3,50 m each and two technological sidewalks of 0,50 ... 0,55 m on one side and the other of the carriageway part. The sidewalks will be provided with two PVC pipes, embedded inside. The side road is provided with 2,0% transverse slopes to

the sidewalk. The sidewalks shall be offset from the level of the road, by means of a curb of type A1.

The waterproofing of the supports will be done by the execution of a screen of reinforced concrete with a thickness of 20 cm, in front of the slurry walls/ molded walls and of the pile cages/ piled piles. The screen has the role of waterproofing the structure, especially by using a special concrete and treating each joint with special strips. Due to the high height of the parapet, it is no longer necessary to install a safety parapet, but in order to achieve a more special architectural aspect, an ornamental parapet with a height of up to 250 mm will be made.

2.8.1.4. The underground parking

At the conception of the optimal solution for positioning the future investment within the limits of the land proposed by the project, the topo and the on-site studies were counted. The relief of the land as well as the existing accesses concluded the solution presented in the project. Compared to the passage, the parking position also takes into account the conditions imposed by the above-ground environment in the immediate vicinity of the parking position. The new parking lot will serve both the newly designed recreation area and the public buildings. The construction will be carried out in compliance with the quality and safety requirements in operation imposed by the specific legislation in force. The structure of the building will comply with the law 10/1995 regarding the quality in constructions according to the details specified in the technical report of resistance.

The project solves the operational safety of the objective by the following provisions in accordance with NP 24-97: the safety of the building is solved by the constructive solutions chosen; people's safety is ensured by the use of non-slip materials.

3. Conclusion

It can be concluded that the new passage will decrease by almost a third the duration of the crossing of the central area (from the intersection of Danube Street - Bucharest Street to Danube Street - Tudor Vladimirescu Street, about 0.96 km) and the crossing speed will increase from 22.45 km / h (2015) to 31.15 km / h (2025).

Table 3. Duration of crossing the central area, the values refer to the base year 2015, the variant „without passage ”

Year	Average time of crossing the central area		Average speed of crossing the central area		Travel time reduction [%]	Increased speed [%]
	“ Without passage” variant [s]	-	Version “ with passage” [km/h]	-		
2015	160.2	-	22.45	-		
2025	195.1	109.9	16.5	31.15	31.4%	38.8%

Source: Feasibility study for “Reconfiguration of road and pedestrian traffic in the central area of Alexandria- Road Passage”

By 2023, the City Hall of Alexandria intends to transform the Municipality into the regional pole that will impress by building the largest central urban area without traffic and reduced pollution, dominated by the Arts Center and in which a special role will be played by modern green spaces.

It also follows, offering citizens a developed public service infrastructure, benefiting from an accessible and fluent circulation system, interspersed with green spaces that will give a pleasant environment and protect against pollution.

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