CHARACTERISTICS OF TRANSPORT AND ROAD NETWORK

Mutalova Barno Irgashevna
Tashkent University of Architecture and
Civil Engineering Associate Professor
senior teacher: **Abdullayeva Kamilla Javdatovna**

Abstract: *This article discusses the basic requirements for transport infrastructure, transport and the road network.*

Key words: *street, trackless, cars, bicycles, motorcycles, scooters, sidewalks; - bicycle paths; rail transport tracks; green spaces.*

The transport network should create the ability to travel along the shortest routes between destinations, have sufficient density, and its layout should be simple, without complex intersections. The following types of public passenger transport are common in a modern city: tram, bus, taxi, metro. Urban passenger transport is classified by type of use; by location relative to the streets; by the nature of the track devices: individual (street, trackless, cars, bicycles, motorcycles, scooters);) public (street, trackless, passenger parking lots, taxis). street trackless transport includes: minibuses, buses.

The city's road network is formed as an integral system, interconnected with the network of transport highways in the settlement area. The structure of the network is determined by the general planning structure and size of the city, the relative position of its parts. The street grid is the planning basis of the city plan. Streets provide communication and connections within the city; utility networks are laid underneath them. A rectangular street network is streets that intersect each other at right angles. It is typical for flat terrain conditions, and some elongation of connections along the perimeter of the rectangle is eliminated by including diagonal directions in the street grid.

The radial-ring network easily connects all parts of the city with the center, however, with insufficiently developed ring highways, radial directions overload the central part of the city, where the diameters of the main streets intersect.

The free street network has a picturesque layout, linked to the natural features of the city. It is used, as a rule, in small towns, satellite cities and certain areas of large cities with their dissected layout. In direct connection with the road network, the organization of transport and pedestrian traffic in the city is also decided, which is one of the most important conditions ensuring the normal functioning of the city, convenient connections between its individual parts, taking into account the time spent on movement within 30-

45 minutes of pedestrian accessibility of public transport stops. A street is a part of the territory of a populated area intended for the passage of all types of urban traffic, drainage of surface water, laying underground networks, placement of green spaces and ground equipment. The boundaries of the street along its width are red lines.

Within the streets there are: roadways; sidewalks; - bicycle paths; rail transport tracks; green spaces (to isolate pedestrians from the roadway, for dividing strips); ground equipment devices: ground lighting masts; electric transport network supports; transport stop signs; traffic control signs.

The main difference between streets and roads is the absence of development on the territory directly served by the road. Roads are laid, as a rule, along undeveloped areas of urban areas and are intended to carry large, homogeneous traffic flows at high speeds in transit in relation to the terrain being traversed.

The main criteria for assessing transport infrastructure are the speed of movement and the time spent on movement.

Basic requirements for transport infrastructure: rational distribution of traffic volumes; combination of speed of movement with comfort; ability to develop in accordance with the development of all elements of the city; the ability to choose the type of communication depending on the distance of movement, the nature of connections and the functional organization of the territory; intensification of intracity connections while reducing travel time. The principle of separation of transport and pedestrian traffic, expressed in the classification of city streets, is the basis for the planning structure of the city and its individual parts.

Streets and roads according to their purpose are divided into: high-speed roads; main streets; local traffic streets; streets and roads of industrial and warehouse areas; park roads; pedestrian roads; main streets; embankments.

High-speed roads are routed outside residential areas. Separating green stripes are provided along them, and interchanges for intersecting traffic are designed in different conditions. Expressways must exclude oncoming or intersecting traffic flows and be sufficiently isolated from each other. Intercity transit highways are routed around the city. Main streets of citywide and regional significance are the main routes of mass passenger transport, they are laid at intervals of 800-100 m from each other, transport stops should be at a distance of 300-400 m from home and place of work.

Local traffic streets are intended for direct connection with individual buildings and structures of the microdistrict. The network of these streets should not be dense and should not exclude the possibility of through traffic flows.

Local roads do not have a direct connection with the development; pedestrian traffic is excluded on them. They are intended for access to landfills, quarries and other objects of local importance. Streets and roads in industrial and warehouse areas are arranged to transport passengers and goods to enterprises and warehouses. Their roadway must support the movement of all types of urban transport in a given city. Park roads are intended for walking and connecting with remote places in a park or forest park. Occasional vehicle traffic is possible here and lanes for cyclists are required.

Pedestrian roads are intended for pedestrian connections between residential areas and microdistricts and places of work, recreation, and public centers. Main streets are intended to organize traffic between individual urban areas; they connect expressways and provide direct access to the final destination of transport. Traffic on main streets is regulated by traffic lights and other types of signals, and parking lots, turns, entrances and exits are monitored. The network of main streets forms the basis of the city's transport system. Construction is underway along the red lines with buildings, the first floors of which are predominantly occupied by institutions and enterprises for cultural, social and commercial purposes. These streets are being improved and landscaped.

On holidays, traffic on the main streets is excluded; they are provided for processions to the central square and parades. Holiday festivities and celebrations also take place here. Often in large cities, within the main streets, traffic traffic is completely excluded and only pedestrian flows are allowed, and traffic traffic is transferred to parallel duplicate streets. The main streets sometimes include the so-called shopping streets, connecting the population with trade, food and consumer services. It is advisable to free these streets from intensive urban transport. They must also have parallel-duplicate transport connections for the delivery of goods to trade enterprises and sufficient parking areas. In hot climate areas, on shopping streets within pedestrian traffic, it is advisable to install a roof to protect from the sun, and place ponds and fountains that improve the microclimate. Embankments are streets near a body of water where heavy traffic is excluded.

The embankment is being landscaped and extensively planted, with greenery located in the middle of the embankment or along the shore. The longitudinal slopes of the roadways of all streets are determined by the safety of traffic and the need for precipitation runoff. The highest slope for city and regional highways is assumed to be 5-6%, and for expressways - 4%. The longitudinal slope of the sidewalks should not exceed 8%; with steeper terrain, steps with a slope of 1:3 are installed on the sidewalk, the number of which should be laid in one flight. The street consists of a roadway, a sidewalk and a green strip, with the roadway located in the middle of the street. The

width of the roadway is determined based on the intensity of traffic and the composition of the traffic flow, as well as taking into account its category.

In mixed traffic, each type of transport with a different speed limit is given a separate lane of the roadway. The higher the speed of transport, the further the lane is located from the sidewalk. The width of one lane is accepted: 3.5-3.75 m for city highways and 3.5 m for regional ones. When designing highways with heavy traffic (1000 or more cars per hour), a transit roadway and local passages isolated from it on both sides are allocated.

The dividing strips between the main roadway and local traffic passages are 6 m wide, and between the roadways of oncoming traffic - 3 m.

The city's transport hub consists of a complex of lines, structures and devices for all types of external and internal transport. All operational work of all types of transport in the city is built on the principles of interconnectedness. The outline of the entire complex of the city's transport network depends on two main factors: the general planning structure of the city and the requirements of the transport itself, which determine its normal operation. The problem of transport services in a modern city, especially a large one, is very complex. The rapid growth of our cities has created an urgent need for the development of all types of external and internal transport that can cope with the sharply increased passenger and freight traffic necessary for the normal life of the city.

Currently, solving a general plan for a large or large city is impossible without solving, first of all, the problem of transport services for the city. It is possible to correctly solve the city’s transport problem only with a comprehensive consideration of the general structure of the city and all types of transport, both external and internal, in their mutual connection, taking into account the role played by individual types of transport. The movement of vehicles and pedestrians at intersections can be organized: at one level without regulation or with self-regulated movement in the square with a continuous flow of traffic around the ring; on the same level with traffic regulation by traffic lights or traffic controllers; at different levels combined in the form of continuous traffic movement around the ring, regulation of individual secondary directions and the passage of main traffic flows at different levels.

1. Simple intersections with very low traffic volumes in the directions being crossed. Larger intervals between passing cars on the same street make it possible for transport and pedestrians traveling along the intersected street to safely cross this direction. Such intersections are located on residential and other local streets; traffic on them is not regulated.

2. Self-regulated intersections with low traffic intensity, which makes it possible to replace the intersection of traffic flows by changing lanes with the organization of unregulated traffic. These intersections can be located at the intersections of highways of regional significance, and in small and medium-sized cities, of citywide significance.

3. Controlled intersections with significant traffic intensity, for the safe passage of which regulation of the movement of vehicles and pedestrians is used.

According to the conditions for the passage of traffic in directions, intersections can be located on two-way or one-way streets. According to foreign data, the length of construction sections in areas with circular continuous traffic at one level is recommended to be 40-60 m. The design of the intersection of main streets should solve the main problem of organizing the passage of maximum modern and future flows of transport and pedestrians in all directions with the least delays and the greatest traffic safety. To solve this problem you need:

- examine current and determine future volumes of traffic and pedestrian traffic at the intersection, ensuring conditions of convenience and safety;
- calculate the capacity of intersecting streets and intersections, checking its compliance with the future traffic volumes;
- determine the number of traffic and pedestrian traffic lanes at the intersection and approaches to it and establish the required width of roadways and sidewalks;
- draw up cross-sectional profiles of streets at the approaches to the intersection;
- design a plan for the intersection, ensuring the necessary turning radii of vehicles, observing the length of the rebuilding sections, drawing the contours of guide islands, traffic islands, roadways, green spaces, sidewalks, pedestrian crossings and red lines;
- outline the placement of public transport stops;
- develop a project for the vertical layout of the intersection and approaches to it in red horizontal lines, ensuring surface drainage of storm water and placement of water intake wells for the drainage network.

At simple intersections of residential streets with very low traffic volumes, traffic can pass without regulation. The right of way is given to cars moving on a street of a higher category. At intersections of streets of the same importance, the following order of movement is observed by type of vehicle: non-rail mechanical and all mopeds; other (non-mechanical). When turning left, the driver of any non-rail vehicle must let everyone moving from the opposite direction go straight and to the right.

In case of two-way traffic at the intersection of two streets, the passage of vehicles without mutual intersections is possible in all directions only during four working periods: straight along one of the streets, two left turns from the same street, straight

along the intersecting street, two left turns from the intersecting street. As a result, there are 32 conflict points at the intersection at 16 intersections, 8 mergers and 8 branches. A further reduction in the number of intersection points can be achieved by planning one-way streets. In this case, however, serious inconveniences arise in organizing traffic along a winding route with large overlaps along secondary streets located perpendicular to the main streets.

The main advantages of areas with circular self-regulated traffic: the ability to pass traffic without regulation with changing flow ratios in directions; convenient passage of passenger transport routes and convenient conditions for turning transport in the opposite direction. The main condition for a good layout of a square with a roundabout is the intersection of the streets flowing into it at a right angle or close to it on a calm terrain. Connections in the form of a T-shaped intersection with self-regulated traffic are used for small traffic volumes on the main street and the adjacent street. This usually occurs when residential streets adjoin district highways or city-wide main streets. In places where streets bifurcate into two directions, U-shaped intersections are designed. It is advisable to take the width of the carriageway of each street after the branching less than the width of the carriageway at the junction. For small traffic flows, self-regulated traffic flow can be used at the junction.

To do this, a triangular-shaped guide island is installed at the fork around which traffic flows pass counterclockwise. When designing traffic management schemes at intersections, the main difficulties are caused by the passage of flows turning left. Detours around guide islands can be replaced by detours around individual buildings, structures, public gardens, parking lots or small neighborhoods. If traffic flows in both intersecting directions reach large sizes (about 1000-2000 cars per hour), then they are passed in direct directions with the construction of four sectoral islands and the organization of traffic regulation at the mouths of incoming streets.

Cross-circular traffic has significant advantages, especially in urban environments, because provides convenient safe passage of significant traffic and pedestrian flows, as well as public transport routes, convenient turning of transport in the opposite direction and the possibility of a consistent increase in capacity as traffic volumes grow. The main disadvantage is traffic delays at traffic lights.

Transport hubs with intersections at different levels are complex and expensive structures worth several million soums or more. Therefore, when designing intersections at different levels, an economic justification for the need for their construction should be developed with an analysis of other less expensive measures to ensure the required capacity.

The arrangement of intersections of city highways at different levels makes it possible to increase the capacity of transport hubs, increase the speed and safety of traffic, eliminate or significantly reduce delays of transport and pedestrians at intersections and squares, and reduce changes in economic costs caused by delays and a decrease in the speed of transport. The construction of intersections at different levels is provided for when developing master plans for cities on expressways and main streets with continuous traffic; at the entrances to the city at intersections with non-urban roads of categories I and II; at transport hubs when flows on intersecting highways in each direction exceed 2,000 vehicles per hour. Depending on the design, intersections at different levels can be of the following most characteristic types: ring, clover, loop, diamond-shaped and combined.

Squares with roundabout traffic with intersections at different levels can be used on main streets of citywide importance when traffic flows on them exceed the capacity of cross-circular traffic at one level. Depending on the category of intersecting highways and the size of traffic flows, ring areas are designed on them with successively increasing throughput with the following traffic organization.

1. Self-regulated circular traffic with a tunnel under the square or an overpass above the square is designed at the intersection of continuous city-wide traffic highways with secondary directions.

2. Cross-ring traffic with a tunnel under the square or an overpass above the square is designed at the intersection of continuous traffic highways and expressways with controlled traffic highways.

3. The layout of the area on three levels with a tunnel, overpass and self-regulated traffic circle is designed at the intersections of city-wide highways of continuous traffic with each other or with expressways.

4. An improved ring with five overpasses is designed in exceptional cases on non-urban roads.

Squares with roundabout traffic have significant advantages, especially when used in urban environments. They provide convenient organization of turning movement. The intersection of the type and clover leaf is solved in two levels with four right-turn and left-turn exits, reminiscent of clover places in their design. Separation of levels is achieved by one of three methods: raising one of the passages onto an overpass or embankment, deepening one of the passages into a recess, or partially raising one and deepening the other direction.

In addition to standard solutions, complex and combined intersections at different levels are designed by combining elements of different types of intersections, mainly

such as clover leaves, left-turn separate exits, loops and lane change areas. According to their purpose, city squares are divided into main squares, residential squares in front of public buildings, shopping, station and transport squares. Retail areas are located near department stores and markets. These areas should provide convenient movement for large masses of pedestrians and provide parking for cars and trucks. The movement of transit transport, although it is planned to bypass the square, its stops should be as close as possible to it, and unimpeded access for freight transport and the economic part of the commercial building should be ensured. An isolated area is allocated on the square for loading the store with goods and temporarily storing containers.

Station areas are organized at railway, sea, river and automobile stations, and at airports. Station squares serve as a kind of “gate” for entering the city.

They require complex interchanges for the movement of vehicles and pedestrians without crossing them, as well as delineation of parking lots for cars, trolleybuses, trams and buses. Transport areas are intersection points of urban transport highways, where the regulation and distribution of traffic flows takes place. The size of these squares is determined by the volume of traffic and the number of streets crossing the square.

LITERATURE:

1. Cherepanov V.A. Transport in city planning. - M.: Stroyizdat, 2011.
2. Stepanov V.K., Velikovsky L.B., Tarutin A.S. Basics of planning of populated areas. - M.: Higher School, 2016.
3. ShNK 2.07.01 – 03 Urban planning. Planning of development and construction of territories of urban and rural settlements. – T.: State Committee for Architecture and Construction of the Republic of Uzbekistan, 2003.
4. Исраилова, Н. Х. (2016). Конкретная поэзия как инновационное направление в немецкой литературе. Научная дискуссия: инновации в современном мире, (4-1), 197-201.
5.Israilova, N. H. (2016). Der Einfluss des Englischen und Amerikanischen auf die deutsche Sprache. In The Seventh International Congress on Social Sciences and Humanities (pp. 143-146).
6.Kh, I. N., Mamatova, N. K., & Mamatov, R. R. (2021). Methodology Of Teaching German As A Second Foreign Language. Экономика и социум, (3-1 (82)), 103-106.
7.Israilova, N. X. (2024). " KITSDEUTSCH" AS A NEW DIALECT IN A GERMAN COUNTRY. International Journal of Education, Social Science & Humanities, 12(4), 678-682.
8.Durdona, I. (2024). INTERAKTIV TEXNOLOGIYALARNING CHET TILI O‘QITISHDAGI O‘RNI. СОВРЕМЕННОЕ ОБРАЗОВАНИЕ И ИССЛЕДОВАНИЯ, 1(1), 227-232.

9.Isamutdinova, D. (2024). INNOVATSION PEDAGOGIK TEXNALOGIYA ASOSIDA CHET TILI DARSLARINI TASHKIL QILISH. СОВРЕМЕННОЕ ОБРАЗОВАНИЕ И ИССЛЕДОВАНИЯ, 1(1), 86-89.

10.Isroilova, H., & Isamutdinova, D. (2024). INNOVATSION PEDAGOGIK TEXNOLOGIYA ASOSIDA DARSLARNI TASHKIL QILISH. MODERN EDUCATIONAL SYSTEM AND INNOVATIVE TEACHING SOLUTIONS, 1(2), 218-223.

11.Isamutdinova, D. (2024). LANGUAGE AS A CULTURAL HERITAGE. Экономика и социум, (4-1 (119)), 175-179.

12.Маткасимова, М. Э. (2024). ЛИНГВИСТИЧЕСКИЕ ОСОБЕННОСТИ В SMS. International Journal of Education, Social Science & Humanities, 12(4), 687-691.

13.Исраилова, Н. Х. (2016). Конкретная поэзия как инновационное направление в немецкой литературе. Научная дискуссия: инновации в современном мире, (4-1), 197-201.

14.Матқосимова, М. (2024). НЕМИС ТИЛИДАГИ СИМВОЛИК ВОСИТАЛАРНИНГ ЎЗБЕК ТИЛИГА ТАРЖИМАСИ. IQRO INDEXING, 9(2), 601-605.

15.Жаббарова, Ю. (2024). Chet ellik talabalar uchun lingvistik va madaniy komponentlarni o ‘z ichiga olgan darsliklar va o ‘quv qo ‘llanmalarini yaratish. Лингвоспектр, 3(1), 180-184.

16.Xujamuradovna, J. Y. (2024). MATN SHAKLLANISHIDA QARINDOSHLIK ATAMALARINING O ‘ZIGA XOS O ‘RNI. worldly knowledge conferens, 8(2), 71-73.

17.Xujamuradovna, J. Y. (2024). “QARINDOSHLIK” KONSEPTI SEMANTIK KO ‘LAMINING YAQIN VA UZOQ HUDUDLARIGA BIR NAZAR. International journal of scientific researchers (IJSR) INDEXING, 5(2), 1468-1470.

18.Жаббарова, Ю. (2023). Значение интеграционных процессов в образовании. Актуальные проблемы обучения социально-гуманитарных наук в медицинском образовании, 1(1), 57-64.

19.Жаббарова, Ю. (2023). Образование молодежи–судьба народа, прогресс родины. Актуальные проблемы обучения социально-гуманитарных наук в медицинском образовании, 1(1), 48-56.

20.Жаббарова, Ю. Х. (2023). ВЕРБАЛИЗАЦИЯ КОНЦЕПТА «РОДНЯ» В УСЛОВИЯХ ДИСКУРСА. In НАУЧНЫЕ РЕВОЛЮЦИИ: СУЩНОСТЬ И РОЛЬ В РАЗВИТИИ НАУКИ И ТЕХНИКИ (pp. 81-83).