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Principles for Placement of Traffic Intersections at Different Levels

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Abstract: Essentially, in this stage we are talking about creating good conditions at the intersections of small towns and roads, for example: high-speed roads, main streets, streets and roads of local importance, residential streets, industrial and warehouse streets, passages for transport connections of regional importance, etc. d.

Keywords: Intersections, high-speed, highway, warehouse, industrial, transport, communications, meaning.

When drawing up master plans for new cities and reconstructing existing ones, a planning structure of highways is developed and a classification of the street network is established.

Construction codes and regulations provide for the following categories of city roads, streets and driveways (SNiP II-K.3-62):

1. express roads are intended for high-speed transport communication of remote areas of a populated area with each other, with large industrial areas located outside the populated area, and with highways of the general network.

   On this category of roads, continuous traffic movement must be ensured with all intersections at different levels;

2. Main streets of citywide significance are intended for transport connections between residential, industrial, warehouse areas, as well as with the center of a populated area, objects of citywide significance (center, railway station, park, stadium, etc.), with expressways and highways of the general network. On this category of streets, depending on the importance of transport hubs and their capacity, intersections can be at the same or different levels;

3. main streets of district significance are intended for local transport links within residential and industrial areas, for transport connections of residential and industrial areas with main streets of citywide importance and expressways. On these streets, intersections are arranged mainly at one level;

4. streets and local roads:

   a. residential streets - for transport and pedestrian connections of microdistricts and individual groups of buildings with main streets;

   b. streets of industrial and warehouse districts - for transport and pedestrian connections of individual industrial enterprises and warehouses with main streets;

   c. driveways - for transport connections within microdistricts and microdistricts with local traffic streets; entrances to individual facilities in industrial areas;

5. pedestrian roads - for pedestrian connections in microdistricts and residential districts with places of work, recreation, public centers, cultural and public service points and public transport stops. Alleys in parks and forest parks.

Guided by the above classification of the road transport network of populated areas when designing master plans of cities, a schematic diagram of the placement of intersections at different levels is being developed. At the same time, on expressways, regardless of the category of the street crossing it or the street adjacent to it, all intersections must be resolved at different levels.

Main streets of citywide importance are divided into highways with continuous traffic and highways with intermittent controlled traffic.

In the first case, based on the estimated size and speed of traffic along the highway, as well as the capacity of nodes in large cities, all intersections are solved primarily at different levels. In the second case, the construction of intersections at different levels is provided only at the busiest transport nodes, which require an increase in their capacity.

On urban highways of regional significance, intersections at different levels are, as a rule, not provided. However, even here at some of the busiest transport hubs, especially in large cities, the feasibility of their installation cannot be ruled out. On streets, roads and driveways of local importance, characterized by a short length, insignificant traffic flows and low speeds, intersections at different levels are not used.

In small cities with a population of up to 100 thousand people, the road network is designed without intersections at different levels, with the exception of suburban highways.

Given the high volume of traffic flows on intersecting highways, the most radical measure to increase capacity, speeds and traffic safety is to create conditions that ensure continuity of traffic.

Highways for continuous traffic must meet the following basic requirements:

A. the movement of traffic at intersections with other directions is carried out unhindered at different levels or through self-regulating roundabouts at the same level;

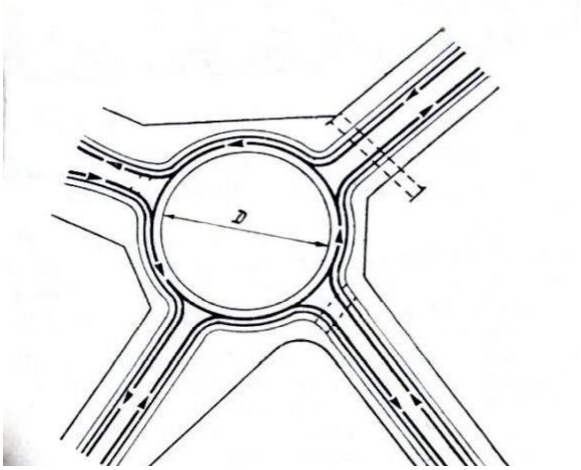
B. outside traffic intersections, only right-turn entries and exits from streets and driveways adjacent to the highway are allowed;

C. pedestrian traffic across the roadway is carried out only at off-street crossings (under the roadway or above her).

Creating conditions for continuous traffic flow is also an integral requirement for urban roads of the highest technical class - expressways designed to carry transit traffic flows at speeds of up to 120 km/h.

The design and construction of urban expressways, in contrast to highways with continuous traffic, are subject to additional requirements. They consist of completely isolating the road from the surrounding buildings and from pedestrian traffic along their routes, limiting entries and exits from adjacent driveways with right turns and allowing only express public passenger transport with sparsely located stops to pass through them.

High-speed city roads, in contrast to main streets with continuous traffic, are usually located at a different level - on an overpass, in a cut-out or in a half-ditch.



1. Self-regulating roundabout at one level.

Continuity of traffic flow on main streets can also be achieved by creating self-regulating roundabouts at the same level with the installation of an island of sufficient diameter on the axis of the intersection of streets, around which there is one-way traffic in all directions (Fig. 1).

The diameter of such an island used for landscaping, when two streets intersect, must provide sufficient distances between the driveways entering the intersection. These distances depend on the number of traffic lanes on the driveways entering the junction, intended for traffic in one direction, and must meet the requirements to ensure that moving vehicles can change lanes along the ring drive from the outer lane to the inner lane and back without crossing each other.

Calculations show that the minimum length of sections required for changing lanes should be 50-60 m, which is achieved when the diameter of the ring island (square) is at least 60 m. However, even this does not exclude the possibility of "hidden" intersections of moving vehicles, which leads to the need to reduce the speed at such an intersection. For these reasons, the use of self-regulated interchanges on expressways is not recommended.

On highways with large traffic flows, traffic continuity and safety can only be achieved by constructing intersections at different levels.

The design of urban transport intersections and off-street pedestrian crossings in the conditions of reconstruction of the existing street network with the existing development differs significantly from the conditions of their design in free territory and on suburban highways. In the established part of the city, the design and construction of such structures becomes much more complicated, since the choice of intersection type is limited due to the presence of capital buildings and a dense network of underground communications.

Circumstances often lead to the need to demolish capital buildings and major reconstruction of underground networks, and this in turn leads to a significant increase in construction costs and an extension of the work period.

The design and construction of intersections at different levels in Moscow have shown that in some cases the volume of related work takes up a large share in relation to the cost and time of construction of the structure. For example, during the construction of a transport tunnel on Mayakovsky Square in Moscow in 1960, in order to preserve a permanent four-story building, it was necessary to lengthen the closed part of the tunnel and lay it under the house, which led to complex work to strengthen the foundation of the house and block the tunnel.

The construction of intersections at different levels on existing city highways is also complicated by the frequent need to carry out work without stopping traffic.

Such difficulties are eliminated when constructing intersections at different levels in undeveloped areas or in areas pre-designated for this purpose in new development areas.

Regardless, however, of these circumstances, the order of construction of these structures should be established on the basis of detailed transport and economic feasibility studies. Their necessity is determined by the relatively high cost of constructing transport intersections at different levels, therefore it is economically feasible to carry out construction only after the exhaustion of cheaper transport planning and regulatory means that provide sufficient traffic capacity, speed and traffic safety for a certain period of time.

Based on this, urban planners, when developing master plans for cities and individual areas based on comprehensive long-term schemes for the development of transport and its movement, the structure and classification of the street network, must provide for the placement of intersections at different levels, so that in the projects of red lines (development control lines)) territory was reserved for the unhindered construction of these structures as traffic grew.

At those nodes where it is planned to construct intersections at different levels in the future, a scheme for organizing the movement of transport and pedestrians in the first phase of construction should be developed, providing for the most appropriate use of all elements of the node during its full development. This can be achieved by laying roadways separated in directions with a reservation between them of sufficient area to subsequently accommodate all intersection elements at different levels. The reserved area can be used for temporary landscaping, and the constructed driveways, after complete reconstruction of the intersection, can be used as driveways for organizing turning traffic along them. For these purposes, the red line project should be accompanied by traffic management diagrams at the nodes with a choice of the type of intersection at different levels.

Conclusion

In addition, as can be seen from Fig. 1, changing lanes of cars moving in all directions is carried out through one lane of the ring roadway, the throughput of which is 1200-1500 cars per hour. Consequently, an intersection with a roundabout with unregulated traffic can only be made if the volume of traffic on each of the adjacent streets does not exceed 500-600 cars per hour.

References:

1. Razikberdiev, M. (2023). On the Use of Foreign Experiences in Preserving the Historical Parts of Cities. *CENTRAL ASIAN JOURNAL OF ARTS AND DESIGN*, *4*(9), 41-46. Retrieved from https://cajad.centralasianstudies.org/index.php/CAJAD/article/view/412.
2. Ismaildjanovich R. M. The place of landscape architecture, traditional landscape and horticulture in urban planning. – 2021.
3. Яшнар Мансуров Проектирование как стадии творчества // ОИИ. 2021. №5. URL: https://cyberleninka.ru/article/n/proektirovanie-kak-stadii-tvorchestva (дата обращения: 22.02.2024).
4. Махмудова М. Т. НОРМАН ФОСТЕР-ЛИДЕР СОВРЕМЕННОЙ АРХИТЕКТУРЫ XX-XXI ВВ //Экономика и социум. – 2021. – №. 10 (89). – С. 876-886.
5. Исакова М. Б. АНАЛИЗ СОСТОЯНИЯ СОЗДАНИЯ БЛАГОПРИЯТНОЙ АРХИТЕКТУРНОЙ СРЕДЫ НА УЛИЦАХ НАШЕГО ГОРОДА ДЛЯ ЛЮДЕЙ С ОГРАНИЧЕННЫМИ ВОЗМОЖНОСТЯМИ //Экономика и социум. – 2021. – №. 10 (89). – С. 699-707.
6. Исакова М. Б. АНАЛИЗ СОСТОЯНИЯ СОЗДАНИЯ БЛАГОПРИЯТНОЙ АРХИТЕКТУРНОЙ СРЕДЫ НА УЛИЦАХ НАШЕГО ГОРОДА ДЛЯ ЛЮДЕЙ С ОГРАНИЧЕННЫМИ ВОЗМОЖНОСТЯМИ //Экономика и социум. – 2021. – №. 10 (89). – С. 699-707.
7. Isakova M. Imkoniyati cheklangan bolalar san’at maktablarida badiiy ta’limni rivojlantirish tamoyillari //Камолиддин Беҳзод номидаги Миллий рассомлик ва дизайн институти АХБОРОТНОМАСИ илмий-амалий журнали. – 2021. – Т. 5. – №. 03. – С. 98-101.

8. KOLDOSHEVA R., MANNOPOVA N., MATNIYOZOV Z. ТЕОРИЯ И ПРАКТИКА СОВРЕМЕННОЙ НАУКИ //ТЕОРИЯ И ПРАКТИКА СОВРЕМЕННОЙ НАУКИ Учредители: ООО" Институт управления и социально-экономического развития",(10). – С. 32-35.
9. Исакова М. Б. Правила Укладки Плитки Тактильной //American Journal of Engineering, Mechanics and Architecture (2993-2637). – 2023. – Т. 1. – №. 8. – С. 12-16.
10. Badirovna I. M. In Uzbekistan, the Possibility of Limited POPULATION of the Architecture of the Environment for the Organization //European Journal of Learning on History and Social Sciences. – 2024. – Т. 1. – №. 2. – С. 58-63.
11. Sultanova, M., Tabibov, A., Xalilov, I., Valijonov, T., & Abdukarimov, B. . (2023). Principles of the formation of theater buildings and performances of the 15th - 17th centuries. *SPAST Abstracts*, *2*(02). Retrieved from https://spast.org/techrep/article/view/4502.
12. Abdukarimov , B. (2021). TOSHKENT SHAHRIDAGI INGLIZ TILIGA IXTISOSLASHGAN O'QUV MARKAZ INTERYERLARINING KOMPOZITSION YECHIMLARI. *Матеріали конференцій МЦНД*. вилучено із https://ojs.ukrlogos.in.ua/index.php/mcnd/article/view/17597.
13. Makhmudova M.T. (2023). Gur-Emir Mausoleum is a Masterpiece of Timurid Architecture. *Periodica Journal of Modern Philosophy, Social Sciences and Humanities*, *16*, 75–82. Retrieved from https://periodica.org/index.php/journal/article/view/466ю
14. Махмудова М.Т. (2023). Мавзолей Гур-Эмир - Шедевр Темуридской Архитектуры. *Periodica Journal of Modern Philosophy, Social Sciences and Humanities*, *16*, 34–42. Retrieved from https://www.periodica.org/index.php/journal/article/view/459ю
15. Kasimov O., & Nasritdinova Feruza Qaxramonovna. (2023). TRENDS AND INNOVATIONS IN MODERN MUSEUM INTERIORS IN UZBEKISTAN ON THE EXAMPLE OF THE WAX MUSEUM. *CENTRAL ASIAN JOURNAL OF ARTS AND DESIGN*, *4*(6), 13-19. Retrieved from https://cajad.centralasianstudies.org/index.php/CAJAD/article/view/379.
16. Kasimov O.S., Miguel Angel Aznar Aznar DEVELOPMENT OF LANDSCAPE DESIGN IN ISLAMIC SPAIN // Теория и практика современной науки. 2021. №10 (76). URL: https://cyberleninka.ru/article/n/development-of-landscape-design-in-islamic-spain (дата обращения: 22.02.2024).
17. Туробова К. Н. (2023). Типы и свойства отопительных приборов. *Американский журнал инженерии, механики и архитектуры (2993-2637)*, *1*(8), 24-27. Извлечено из http://grnjournal.us/index.php/AJEMA/article/view/922.
18. Durdona, P. (2023). Development of Industrial Design Sector in Uzbekistan. *CENTRAL ASIAN JOURNAL OF ARTS AND DESIGN*, *4*(6), 10-12. Retrieved from https://cajad.centralasianstudies.org/index.php/CAJAD/article/view/377.
19. Sultanova Muhayyo Fahriddinovna THE FORMATION OF ART AND ARCHITECTURE OF THE ANCIENT PERIOD // European Journal of Arts. 2023. №1. URL: https://cyberleninka.ru/article/n/the-formation-of-art-and-architecture-of-the-ancient-period (дата обращения: 22.02.2024).
20. kizi Sultanova M. F. The role of tour bases in the development of tourism in Uzbekistan //International Scientific and Current Research Conferences. – 2021. – С. 1-5.
21. Xodjaev A. A., Mansurov, Y. M., Mannapova , N. R., & Yulchiyeva, B. B. qizi. (2023). IMKONIYATI CHEKLANGAN INSONLAR UCHUN JAMOAT BINOLARIDA HARAKATLANISHLARIDAGI MAVJUD TURLI XIL MUAMMOLARNI ANIQLASH. *Educational Research in Universal Sciences*, *2*(4), 560–565. Retrieved from http://erus.uz/index.php/er/article/view/2193.