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Research Article

ON THE NEED FOR AN URBAN COMPACT SINGLE-TRACK VEHICLE IN THE REPUBLIC OF UZBEKISTAN

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ABSTRACT

The problem of urban transport development is considered on the example of Tashkent. The conclusion about the need to solve transport problems of the megalopolis from the point of view of the city and the person is made. One of the ways to solve these problems is to create a compact, environmentally friendly, cost-effective urban transport. This variant of solving the problem of traffic jams in the mega city is considered to be the most realistic and more dependent on engineering solutions and well-established production. The proposed technical characteristics and limitations of urban compact, environmentally friendly and economical transport are considered. One of the types of vehicles that meet these requirements are single track vehicles (STV) - motorcycles, mopeds and scooters.

KEYWORDS

Urban transport; urban compact, environmentally friendly, economic transport; single track vehicles (STV); motorcycle; scooter; monocycle; mono mobile, single track body transport (STBT).

INTRODUCTION

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Tashkent, as a modern megalopolis, has serious traffic problems due to the huge amount of traffic that enters its streets. Moreover, the excess of cars affects not only participants of road traffic, but also all residents of the city [1, 2] (Fig. 1, 2).

Private car owners suffer from traffic jams and inability to get to their destination in a reasonable time, and once there, they lose time looking for a parking space due to its scarcity. Many have problems due to the lack of available parking lots and garages. It should also be noted the high price of fuel [1, 2].

Fig. 1. Traffic jams in Tashkent

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Fig. 2. Traffic on the streets of Tashkent reaches the level of 10 points. View of the city map according to the "Yandex. Traffic Jams" service.

Passengers of ground public transport lose time due to traffic jams and irregular public transport movements [1, 2].

Public services and private delivery companies also suffer from traffic jams, rapid response services (traffic police, ambulances and firefighters) cannot get to problem areas quickly and provide timely assistance.

All residents suffer from smog and noise.

There is a paradoxical situation: on the one hand, modern technology allows to increase the speed of human movement from point "A" to point "B" and, accordingly, reduce the time spent on a trip with a sufficient level of comfort, on the other hand, the number of vehicles and road conditions are such that the actual speed of movement from

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point "A" to point "B" decreases from year to year, and the time of standing in traffic jams increases [2, 3, 5].

It is necessary to solve the transport problems of the mega city from the point of view of the city¬and the person.

One way to solve these problems is to create an urban compact, environmentally friendly, economical vehicle [2, 3, 4, 5].

Advantages: 90% of all private cars in cities are used to transport one or two people to and from work (during rush hours these cars are in majority on the roads), so there is no need in a big car for their moving - smaller vehicle is economical, ecological, requires less parking space, cheaper for maintenance etc;

disadvantages: currently there is no mass production of vehicles that can radically solve the problem of space on the road.

The first three options are the responsibility of the city authorities and their decisions, so we consider the fourth option to solve the problem of traffic jams in the metropolis as the most realistic and more dependent on engineering solutions and established production.

Let us consider the expected technical characteristics and limitations of urban compact, environmentally friendly and economical transport.

Initially, it is necessary to understand what an ideal individual city car should be, so let's consider the requirements for it from different points of view:

- requirements from the point of view of the consumer: compactness, cheapness, economy, safety, all-season;
- requirements from the point of view of the city: compactness, environmental friendliness, safety;
- requirements from the manufacturer's point of view: cheapness in production, maintainability, simplicity, reliability.

Let us consider the types of vehicles that meet these requirements [2, 3].

Small class passenger cars (according to the European classification category "A") (Fig. 2):

- cheaper than the middle class, but not by much;
- smaller in size, but they also occupy one lane and have no advantage in traffic jams;
- are safe;
- they take up less parking space;
- all-season.

CONCLUSION

small class passenger cars partially meet the necessary requirements and only in some respects and will not be able to solve the problems of traffic jams and places that occur in the metropolis.

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Fig. 2. Class "A" compact cars

Single-track vehicles (STV) - motorcycles, mopeds, scooters (Fig. 3):

Advantages:

- Are compact, take up half the lane of traffic, and have serious advantages in traffic jams;
- no problems with parking;
- much cheaper than a car;
- they are economical;
- in natural and climatic conditions of Uzbekistan - practically all-season operation;
- disadvantages:
- unsafe vehicles;
- there is no protection from adverse external factors;
- to move requires special ammunition (helmet, at least).

Conclusion: despite the disadvantages, STV would be ideal as urban transport. In Southeast and South Asian countries, such as China, India, and Vietnam, the number of STV units on the road is much higher than that of other modes of transport, safety problems in these countries are partially solved by low speeds in urban conditions, and the warm climate allows the operation of single-track vehicles year-round without significant restrictions.

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Fig. 3. Motorcycles and scooters (some types of STV)

Single track body transport (STBT) [3, 4] (Fig. 4):

- are compact, occupy half of the traffic lane, and have serious advantages in traffic jams;
- there are no problems with parking;
- cheaper than a car;
- passive safety as in the car (safety belts, airbags);
- economical;
- environmentally friendly;
- In contrast to the STV, protection from adverse external factors and no ammunition is required;
- all-season operation.

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Fig. 4. Variants of STBT

In order for a STBT to have the advantages of both a car and an STV, it must have the following characteristics:

- overall dimensions: length not more than 3.5 m; width not more than 0.75 m; height not more than 1.8 m;
- curb weight - not more than 400 kg.
- fuel consumption must be not more than 1,5 l/100 km;
- speed not less than 90 km/h;
- availability of airbags;
- price not exceeding $2,000.

CONCLUSION

If we create a STBT with characteristics that fall within these limits, it will become an ideal individual transport for megalopolises and a direct competitor to conventional cars.

The type of STBT

Currently, the development of STBT in various countries is just beginning, but it is already possible to classify it according to a number of parameters:

- by the number of riders: one or two;
- by purpose: for public services (traffic police, Interior Ministry, medical services); cab; one-time delivery (pizza, mail, etc.); sports; utilitarian (private); for the disabled;
- according to the method of stability: with retractable chassis; with a gyroscope; with ¬permanent vertical wheels; combined;
- by the number of wheels: two-wheeled, three-wheeled, four-wheeled;
- by type of engine: with internal combustion engine; electric motor; hybrid (with combined power plant);
- by type of transmission: mechanical, electric, combined.

Prospects for STBT development [2, 3, 4].

The process of STBT development can be divided into several stages:

1. The process of accumulation of experience and creation of various types of STBT by private small firms and entrepreneurs is already underway.
2. In the nearest 1-3 years: optimization of STBT designs and launch of small-scale production.
3. 3 The nearest 3-5 years: interest in the STBT on the part of large car manufacturers: large scale testing and design revision.
4. Next 5-10 years: mass production of STBT.
5. Approximately in 10 years: direct competition with conventional cars.

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