

**INTEGRATION OF DAMAS AND BUS TRAFFIC AND INCREASING TRANSPORT
EFFICIENCY IN THE CITY OF ANDIJAN**

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Annotation: The lack of compatibility between the public transport system in the city of Andijan, in particular, Damas cars, and the main bus routes, reduces transport efficiency. Despite the fact that Damas trucks are maneuverable on narrow streets, problems with traffic congestion and road safety arise due to the fact that they are not closely connected with the main highways. The chaotic traffic on Boburshoh Street leads to obstacles on road transport and creates inconvenience for passengers. This article analyzes ways to increase the efficiency of the transport system and improve road safety through the coordination of Damas and bus routes.

Keywords: Andijan, public transport, Damas, bus routes, compliance, transport efficiency

Introduction. In the city of Andijan, the public transport system plays an important role in meeting the movement needs of the population. Currently, several vehicles operate in the city - large and medium-capacity buses, minibuses, taxis, and especially the widespread Damas minivan. Due to the fact that these vehicles move independently, and not in harmony with each other, there is a lack of consistency in the transport system.

Damas cars, in particular, due to their compactness and maneuverability, are widely used on intra-city traffic, on narrow streets. They connect neighborhoods, residential areas, and the outskirts of the city with the center. However, in practice, the fact that these vehicles do not move in close connection with the main bus routes makes them an uncoordinated traffic system[2].

In the city of Andijan, bus routes No. 365 and No. 222 are the main highways, serving to transport a large passenger flow. These routes pass through Babur Shah Street - this street is the transport heart of the city. However, in this area, Damas cars also use the same road, and they move in parallel or sometimes in the opposite direction to the main flow. This situation further exacerbates the lack of compatibility between vehicles [3-7].

Result and discussion. One of the noticeable phenomena on Boburshoh Street is that the movement of Damas and buses, when viewed from above, is chaotic and seems to interfere with each other. When buses unload passengers, Damas cars coming from behind are forced to stop or try to pass on the left side of the bus. This disrupts road safety, increases traffic congestion, and reduces overall traffic efficiency.

In addition, in many cases, Damas cars duplicate their functional role by performing parallel trips to buses in the same direction. As a result, transport resources are wasted, passenger flows are unevenly distributed among several types of vehicles, which indicates the lack of integration of the transport system.

Based on the foregoing, an important task in the modernization of the public transport system of the city of Andijan is the harmonization (integration) of Damas cars with the main bus stops and routes. By:

- eliminate duplicate trips,
- optimize passenger flow,
- reduction of traffic jams and collisions,
- Improving traffic safety,
- there is an opportunity to reduce operating costs.

Passenger flow is the number of passengers passing through a certain point over a certain period of time. Through its analysis, the most in-demand routes in the city or region are identified, areas of traffic congestion and overload in the transport system are identified, the effectiveness of the location of stops is assessed, redundant or inefficient stops are identified, and the possibility of saving transport resources through the integration of bus and minibus routes is studied. This will make it possible to optimize the transport system, create conveniences for passengers, and make informed decisions on the efficient use of resources.

The effective functioning of the city's public transport system largely depends on the coordination of the schedule between various modes of transport - in particular, large-capacity buses and small-capacity Damas cars. Currently, Damas cars are actively operating on many routes in the city of Andijan. They usually started from densely populated areas or the outskirts of the city and were directed to central areas, especially to Babur Shah Street, the railway station, the Old City, and the central markets. At the same time, large bus routes with numbers 1, 33, 222, 365, and others are actively operating in the city. Schedule compliance between these vehicles is one of the main links in the public transport system.

Today's observations show that Damas trucks often operate independently, without a strict schedule, with full capacity. This, on the one hand, ensures short waiting times, and on the other hand, disrupts their coordination with buses. For example, at some stops, Damas cars arrive before buses and pick up passengers, and therefore the buses move in a semi-empty or unevenly loaded state. As a result, bus profitability decreases, and Damas trucks are sometimes forced to operate under excessive load. Such discrepancies negatively affect not only the comfort of passengers, but also the economic and environmental efficiency of the entire transport system.

Therefore, it is necessary to coordinate the Damas schedule with buses. In this process, first of all, the passenger flow is analyzed - that is, at which stops, at what time, what capacity of vehicles is needed. For example, in the morning rush hour - from 7:00 to 9:00 - buses take on the main load on major routes, while Damases carry passengers from the inner regions to the center and perform the function of connecting them with buses at the next stage.

To ensure such consistency, it is necessary to synchronize the Damas schedule with the arrival time of buses, that is, ensure the arrival of Damas at each major stop 3-5 minutes before or after the arrival of the bus. This will create convenient passenger transfers and ensure a continuous traffic flow. For example, if it is known that the bus on route 365 passes through the "Chortoq" station every morning at 7:15, then the Damas cars serving it will have to arrive at this station at 7:10 and bring the population ready. The opposite is also important: if a Damas is driving from the "Markaziy dehqon bozori" (Central Farmers' Market) stop, then before the bus arrives there at 7:45, the Damas must disembark passengers and continue on the next trip.

In addition, the interval of movement between buses and Damas cars is also an important indicator. If the bus runs every 15 minutes, and the Damas cars serving it run every 5 minutes, then 3 Damas cars will depend on each bus. In this way, a "triple synchronous" model can be

developed. In this system, 3 Damas buses are attached to each bus, and they operate according to a specific time schedule.

When coordinating the Damas schedule, real-time monitoring and control can be carried out using GPS monitoring, mobile applications, and digital information systems (for example, transport applications or the display of traffic schedules on electronic dashboards at bus stops). This is convenient not only for transport companies, but also serves as a reliable source of information for passengers.

Another important aspect is ensuring economic balance between these areas. For scheduled vehicles, a certain passenger flow is guaranteed, which stabilizes the income of carriers. This system will also contribute to reducing traffic congestion, fuel consumption, and environmental friendliness.

Schedule Coordination Model

The compliance of the table is determined on the basis of the following criteria:

1. **Traffic flow analysis:**
2. · Number of passengers Q, observed at different times of the day.
3. · Capacity of each vehicle C: For a Damas, Cd=7-8 people,
4. for the bus Ca =40-70 people.
5. The service interval between a Damas and a bus is Δt , i.e., how quickly a passenger gets off one bus and leaves the other.

1. **Schedule Compatibility Assessment Formula:**

$$M = \frac{|T_D - T_A|}{I}$$

where:

- Td-Damas arrival time (in minutes),
- Ta-bus departure time,
- I-optimal value of service intervals (ideally 0-5 minutes).

If $M < 1$, the table is considered consistent; If $M \geq 1$, coordination is required.

Real-time tracking:

For example, at the central bus stop on Boburshoh Street:

- Bus No. 222 passes every 15 minutes;
- Damas cars arriving at this station move every 5-7 minutes;
- However, according to observations, Damas cars arrive 1-2 minutes before or 7-8 minutes after the arrival of the bus.

In this case, the coefficient of conformity is:

$$M = \frac{|T_D - T_A|}{I} = \frac{8}{5} = 1.6$$

This means that the table compliance does not meet the requirements.

Suggested solutions:

Management of the Damas traffic schedule based on the bus schedule using a real-time algorithm (GPS, via a mobile application).

Table consistency must be ≤ 5 min.

In conclusion, coordinating the schedule of Damas cars with buses not only creates convenience for passengers, but also makes the entire urban transport system consistent and economically efficient. The main criteria are the synchronization of travel time, real-time monitoring, accuracy of service areas, and proper distribution of passenger flows. Based on this approach, it will be possible to comprehensively improve the public transport system in the city of Andijan.

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