

# **Possibilities for Implementation the Bus Rapid Transit on City Expressways with Controlled Motion**

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***Abstract – Variants of implementation the Bus Rapid Transit system on city expressways with controlled motion and also possibilities for improvement of traffic management on intersections considering movement of Bus Rapid Transit system vehicles are reviewed.***

Keywords – Bus Rapid Transit, expressway, traffic light control, volume-capacity ratio.

## **Introduction**

Today, due to increasing the number of vehicles in cities, urban public transport plays a significant role. World practice is increase of effectiveness of urban public transport by giving it a priority on road network. One of the most effective modes of public transport is Bus Rapid Transit system (BRT). But for its implementation detailed analysis of road network conditions is necessary, because quite often in cities appears the problem of absence the place for building separate lanes for movement of BRT as there already exists dense construction area.

## **Characteristics of implementation the BRT system on city expressways**

For implementation of BRT system directly on road network, there exists a few variants among which arrangement of separate lanes for buses on curbside, in the middle of roadway, motion of buses in general flow, arrangement of tunnels or elevated roads for BRT system. But two last variants demand significant capital expenditure on facilities construction, and movement of buses in the flow will cause significant delays during their motion. That is why the most effective decisions are implementation of separate lanes for bus movement.

The simplest way is to implement such lanes on expressways because of their sufficient width and large number of lanes. But there often appear vehicle delays caused by bad design and traffic management, such as: unsuitably placed bus stops; narrow bridges and tunnels, absence of multi-level railway crossings; merging of traffic flows; bad regulated parking; not enough optimal calculation of traffic light control; improperly designed and directed intersections [1, 2].

Besides, quite often BRT system can cause contraction the number of lanes for mixed traffic flow. Although ideally movement of large number of buses from mixed flow lanes will allow avoiding increase of traffic jams on them, this happens not always and filling the mixed flow lanes can increase. On fig. 1 there is given filling by vehicles planned corridor BRT. With points A, B, E there are viewed intersections, with point C – narrowing of roadway (for example, bridge), with point D – place of attraction (for example, trade center), where transport delays are observed. As it can be seen from the figure, after implementation of BRT system without any additional engineering measures volume-capacity ratio in these points will increase to saturated [1, 2].

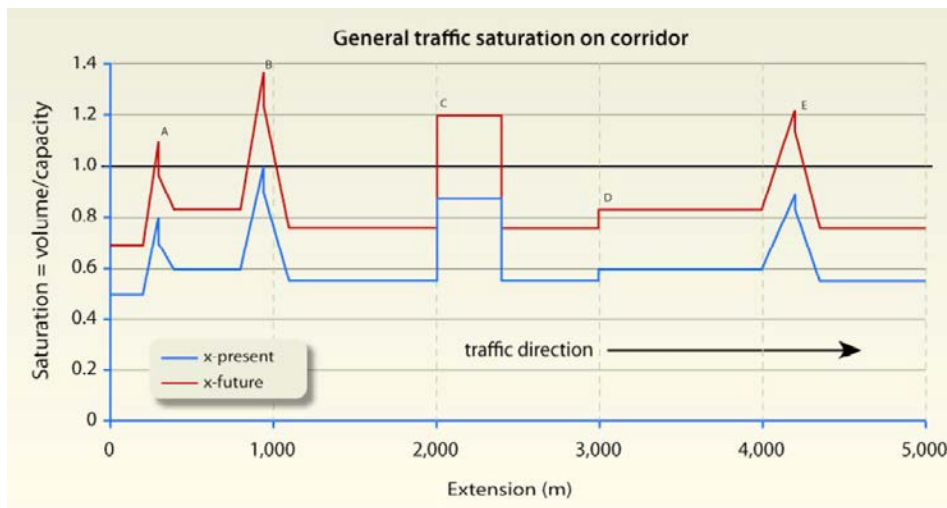


Fig.1. Change of volume-capacity ratio of the expressway after implementation of BRT system without additional measures.

As for narrow sections between intersections, the problem can be solved with the help of increase of control and tightening parking rules, narrowing the directional dividing line, improvement of streets that adjoining to reviewed expressway street, expansion the roadways etc. If such decisions are ineffective or they are impossible to implement, then on approaches to narrow street sections can be implemented traffic light control with sequential passing of general traffic flow and buses of BRT system.

As for intersections, for increase of their effectiveness are necessary organizational decisions. The value of volume-capacity ratio of bus movement on the intersection should not exceed 0,65, in another case usage of BRT system will be ineffective. That is why, it is necessary to review the next variants of traffic management on intersections: restriction of turns for general traffic flow, in particular left turn; allocation of separate phases for movement of BRT system; giving the priority to bus movement while crossing the intersection. Left turn restriction is an effective decision because it liquidates a conflict situation when buses move straight and automobiles make a left turn. But such decision is possible with presence of by-pass ways. Implementation of effective phase separation depends from conditions of intersection, number of lanes and traffic volume. Giving a priority to buses during approaching the intersection is possible again providing that it will not create additional significant delays in movement of general traffic flow.

### Conclusion

So, for provision the effective operation of BRT system without additional delays of general traffic flow it is necessary to review given above organizational measures in complex with considering the features of every intersection of road network.

### References

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