

## CRISIS SITUATIONS IN URBAN PUBLIC TRANSPORT

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*Summary: The paper is focused on characteristics of crisis situations in urban public transport. Individual crisis situations are divided by selected criterions and characterized in detail way. Field of crisis situations and its solution in the case of urban public transport in Prague is mentioned on the end on the paper.*

*Key words: crisis situation; urban public transport; criterion*

### INTRODUCTION

There are able to be found questions of crisis management as well as of controlling in crisis states in various fields and on various places in current situation. The scope of urban public transport operation is not an exception. So called crisis situations or crisis operational states are able to be occurred there only (both will be mentioned as crisis situations in following text only). Responsible authorities are obligated to deal with crisis situations and to accept crisis measurements. The aim of crisis measurements is to reduce, eventually to eliminate consequences of occurred crisis situation and to renew regular passenger transport. It is possible to renew passenger transport in full extent or to regulate it after extent of disturbances of common regular operation.

### 1. DIVISIONS OF CRISIS SITUATIONS IN URBAN PUBLIC TRANSPORT

It is possible to divide crisis situations (theoretically able to be occurred in urban public transport) by following points of view: after duration of crisis situation replacement; after importance of crisis situation and after impact of crisis situation on operation and after scope of impact (factor). (2)

Crisis situations (CS) are able to be divided in the point of view of duration of CS replacement as: (2)

- Short-term – CS are replaced usually during one work shift, working hours or other analogic time period,
- Middle-term – CS have got an important impact on operation of whole transport company or on whole individual urban public transport subsystem (like buses, trolleybuses, trams etc.). Duration of CS replacement will take a few days, at least a few weeks.

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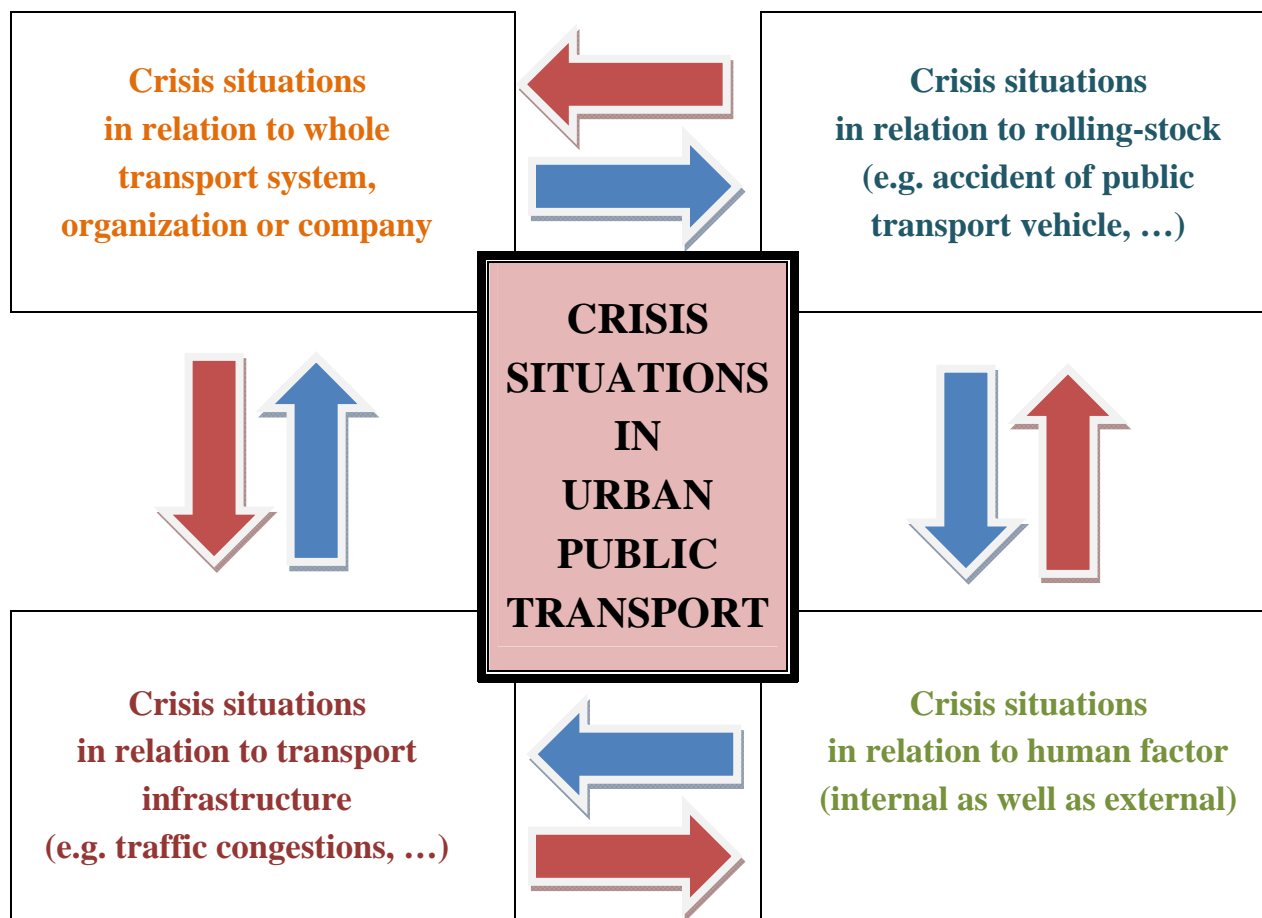
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- Long-term – CS have got a serious impact on transport company, it could be a treatment for operation of transport company (public transport). These CS are able to be characterized by very serious impact as well as by longer duration of replacement.

Dividing of CS after scope of impact (factor) is seen as another possibility of division there. CS are able to be divided into four groups in this point of view: (1) (2)

1. CS in relation to whole transport system, organization or company,
2. CS in relation to rolling-stock,
3. CS in relation to transport infrastructure,
4. CS in relation to human factor (internal as well as external).



Source: Authors

Fig. 1 - Crisis Situations in Urban Public Transport

## 2. DIVIDING OF CRISIS SITUATIONS (CS) AFTER SCOPE OF IMPACT (FACTOR)

### 2.1 CS in relation to whole transport system, organization or company

Following situations are able to be considered as examples of this type of CS: (1) (2)

- decline or serious financial problems of transport company – urban public transport has to be ensured as soon as possible. Activities leading to replacement of this CS would be supported by responsible superior state authority (for non-rail transport by so called

Transport Authority established by the Road Transport Act; for rail transport by Rail Authority established by the Rail Systems Act) in cooperation by local (self-governing) authorities;

- revoking or suspending of licence for operating of public transport line – this type of CS will be occurred in the case if the conditions based in licence agreement are not fulfilled and in the case of licence revoking. This state has to be solved in temporary way by alternative transport supply or by strengthening of other lines. Transport company has to try about fulfilling of conditions for renewal of operation as soon as possible;
- crisis and serious change in the field of legislation for public transport operation – crisis management has to react as soon as possible for adjustment of operation on lines to new conditions.;
- failure of computer network or of electronic check-in (fare collection) or information system. So called manual for solution of such CS has to be prepared in advance. Strict sequences of activities for ensuring of transport with utilizing of substituting possibilities will be determined into this material. It will be depended on extent of utilized modern technical equipment like GPS or GSM systems, communication elements in vehicles, electronic check-in (fare collection) systems based on smart cards etc.

## **2.2 CS in relation to rolling-stock**

This type of CS is able to be characterized by following: (1) (2)

- failure (breakdown) of vehicle on the line – it is essential to ensure vehicle for replacing as soon as possible. This vehicle will finish journey on the line. This problem is reduced in the case of urban public transport, because there are no so long distances (from garage, depot etc.) like in other kinds of transport. In the case of failure it is essential to decide, if the failure is able to be replaced by driver on the place or if it is necessary to use help of service vehicle (dispatcher form of decision making will be used);
- organizing of sport, cultural or other occasions with high number of spectators will cause increased demand on urban public transport services and a risk of overloading of vehicles. Increased demand is able to be recognized at the place and the dispatcher has to drive in advance prepared reserve buses in front of the action (to stop or station with increased demand) operatively;
- accident of public transport vehicle with an impact on environment. Rules and recommendations for this type of CS have to be elaborated in advance in an appropriate manual concerning on relations and communication with Integrated Rescue System (e.g. which employee of transport company will be responsible for communication with fire brigade, or if dispatcher will be responsible directly).

## **2.3 CS in relation to transport infrastructure**

This group of CS is the most extended: (1) (2)

- Short-term or long-term closure of road (or closure of rail line) and necessary diversions of lines – it is possible to be partially prepared for solution of this CS, e.g. in the way of change of composition of lines, of change of line route or by strengthening of other urban public transport lines. Consequences of this closure (especially traffic congestions)

are able to influence other connected parts of transport network (but with different intensity) and able to influence quality of supplied transport services at some connections of urban public transport lines in negative way as well;

- climatic influences on transport infrastructure – it is often occurred and known example of CS in transport. Urban public transport is not an exception. Dispatcher form of decision making will be fully used by this type of CS. Support of crisis management by decision making is possible in the case of extensive problems and problems extended on large area;
- failure of electric converter station or problems in supplying of electric energy has to be taken into account by transport companies operating vehicles depended on electricity. It is able to be said that bus subsystem is standardly used for substitution in the case of such CS (failure on electric-powered subsystem or on electric equipment);
- blocking of transport infrastructure by failed urban public transport vehicle or a traffic accident on transport infrastructure (route). Usually it goes about tram line blocked by failed tram and diversion routes have to be found. Similar situation will occur in the case of tram tracks blocking by traffic accident. Dispatcher form of decision making will be applied;
- traffic congestions – this negative effect is able to cause problems in the field of circulation of vehicles. Vehicle delayed by traffic congestion will not be used on next connection according to time schedule. If the situation is serious, it is useful to use a new vehicle. This solution has to be approved by dispatcher.

#### **2.4 CS in relation to human factor (internal as well as external)**

It is able to be mentioned following: (1) (2)

- Risk of external or internal attack on the system – in this case is going especially about sabotage of operation (external – from surrounding, internal – made by employees of public transport company). Safety of public transport vehicles operation is able to be seriously threat by this situation. It is not easy to prevent this negative effect. The consequences have been solved in an operative way;
- Intentional spreading of disinformation with the aim to damage transport company or serious mistakes in communication between employees. It is able to be caused e.g. by competitive environment on the field of passenger transport in the city. Department for Public relations (or possibly for Public Affairs) plays an important role by solution of this problem. This department has to be prepared for elimination of this negative effect (close cooperation with top-management of transport company is asked as well);
- Strike of operational employees of the transport company – it is not possible to determine general procedures for solving of this complicated crisis situation in advance. Concrete CS has been solved operatively (in ad hoc way) according to real conditions. Attendance of top-management or crisis management is essential.

### **3. CRISIS SITUATIONS IN PRAGUE URBAN PUBLIC TRANSPORT**

In the Prague Public Transit Co. there are known following terms for definition of crisis situations (i.e. crisis events and crisis states) by common situation – out of crisis situation: (3)

1. crisis operation state in urban public transport,
2. crisis event in operation of urban public transport,

(see the operational directives D3/1-2-3 Dispatching Rules of urban public transport operated by the Prague Public Transport Co.).

Crisis operation state is such state by what the transport is not operated accurately due to operational reasons. Operational reasons are following: (3)

- there is totally interrupted operation in station or at stop, on the route of line or on its part,
- transport route is impassable or it is difficultly passable (due to e.g. accident, failure),
- it is necessary to pass station or stop without possibility to stop (without boarding/alighting of passengers),
- it is not possible to fulfill other conditions for accurate operation of transport.

Crisis situations in urban public transport are able to be divided into: traffic accidents and other crisis events.

An event related to movement of vehicle with consequence of death or injury of people, of overtaking of given limit of lack on property, or of threat on life or health is considered as traffic accident in urban public transport.

Other crisis situations in urban public transport are events, which: (3)

- have got similar consequences like traffic accidents, but if they are not related to movement of vehicle,
- threat or disturb safety, regularity or smoothness of urban public transport operation,
- threat or disturb safety of people and safe function of devices and buildings,
- threat environment.

Traffic on concerned line is stopped or limited in the case of crisis operational state in urban public transport. Intended responsible authorities are obligated to eliminate this crisis operational state and its impacts. Elimination of crisis operational state and its impacts in urban public transport means a number of activities organized immediately after occurring of this state. These activities are leading towards elimination of causes as soon as possible, towards acceptance of appropriate measures for ensuring of transport service at affected place or segment of the line. It goes about e.g. shortening, lengthening or diversion of lines, setting of spare (substituting) transport into operation or informing of passengers.

It is ordered inquiry or investigation of crisis situation in the case of occurring of this situation in urban public transport. Inquiry of crisis situation is a number of activities focused on finding out basic information about crisis situation from the point of view of causes of crisis situation, extent of lacks and for subsequent conclusions in the frame of operational directives of the transport company.

Investigation of crisis situation is ensured by intended authorities of state administration and state supervision (Police of the Czech Republic – searching and investigating authorities, transport and rail authorities, (state) public prosecutor's office and courts). Investigation is conducted in offence, administrative or criminal trial. (3)

## CONCLUSION

Crisis situations have got serious impact on function of urban public transport in global as well as in particular point of view as follows from above mentioned information.

The authors suppose that there is mentioned basic information to these actual questions in the paper. These questions are not able to be generalized due to individuality and specificity of individual urban public transport systems.

Authors are conscious that there is mentioned only basic information about these questions in the paper. The authors are ready to explain and to more concretize some information in the case of interest or if the questions to this paper will be asked.

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