TECHNICAL ARTICLE

Convincing management of operating incidents

Every transport operator experiences more or less frequent incidents that disrupt operations. The incidents can be unplanned, as in the case of accidents, or already included in the planning process, for example roadworks or major events.

Each time this happens, many individual aspects have to be taken into consideration to deal with such challenging conditions in the best possible way. On the one hand, dispatch actions and replacement services are of central significance in order to offer passengers the best possible alternatives with the vehicles, sections and staff that are still available. At the same time, the passengers must be provided with the best possible information and support.

The right tools make the difference

A suitable incident management tool such as LIO-IDS provides the control centre with intelligent decision support. Once an incident occurs, only a few clicks are needed to activate all predefined dispatch actions and passenger information. The whole procedure takes less than a minute all-in-all until the actions already come into effect. It makes no difference whether it's a small disruption or major incident. The passengers and drivers are provided with quick, consistent and complete information at all times.

Optimum handling of major incidents

Basically, there are three possibilities for reacting to or preparing large-scale operating incidents: firstly, intensive preparation for all possible eventualities with the corresponding workload, secondly, reacting spontaneously without preparation, or thirdly, good preparation for the most likely scenarios, with the possibility of making spontaneous additions if the incident really happens.

In the first case, the transport operator prepares a complete data supply of all conceivable diversions, short turns and replacement services, possibly also supplying a corresponding timetable if the start and end of the incident are known and fixed. In the second case there is no special data supply or preparation by the control centre: all actions are triggered spontaneously only when the incident occurs.

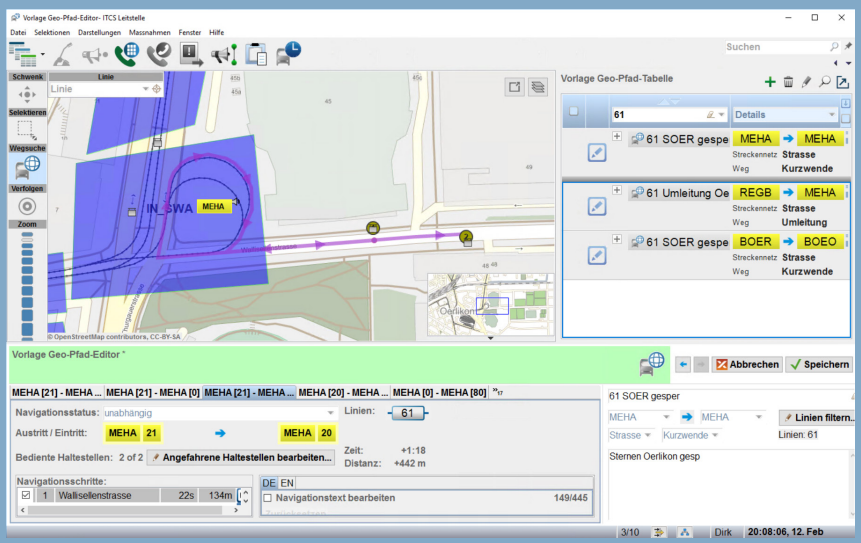
However, we recommend the third possibility, which we feel is the best possible approach. To this end, standard variants for individual sections affected by the incident are prepared in the data supply and control centre, and the dispatch staff use an additional incident management tool.

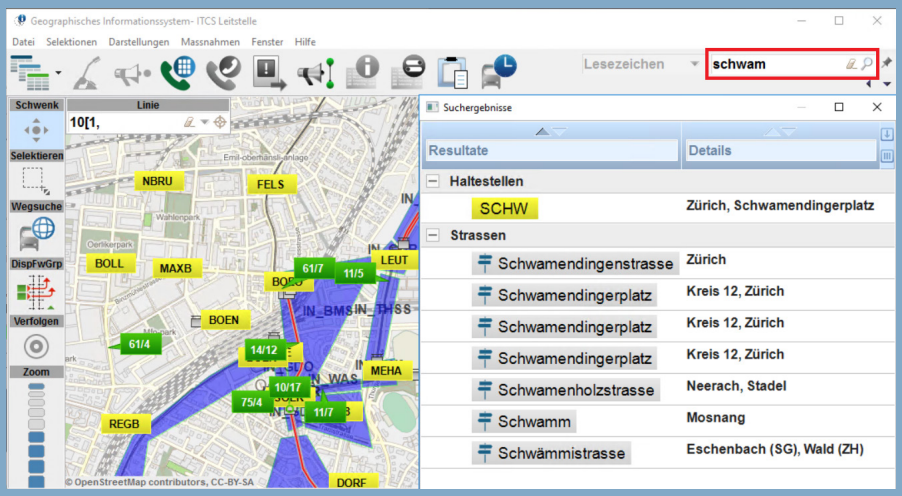
Advantages of this approach:

- The control centre receives the optimum decision support directly
- Incident management phases 1 and 2 can run simultaneously (cf. VDV Recommendation 722)
- Drivers are informed and guided perfectly as quickly as possible
- Visual and acoustic passenger information is provided directly after the incident begins, in standardised form and ensuring optimum understanding
- Full disclosure of the changed paths, departure times and information texts via VDV interfaces to connected information systems
- Maximum number of available staff and remaining vehicles remain productive
- Navigation for the vehicles – even on sections unfamiliar to the drivers
- No wrong-way travel that could magnify the impact of the incident
- Correct automatic switch actuation for rail vehicles
- Adjusted preemption at traffic lights – no additional time lost
- Easier, faster return to normal operation after the end of the incident (incident management phase 3)
- Structured, standardised working in the control centre
- Huge time savings and reduced stress for dispatchers during the incident
- Steady workload in the control centre: preparations can be carried out in incident-free times
- Passengers get used to structured procedures and information
- In spite of the disruptions, passengers are satisfied or even enthusiastic (“The incident isn’t their fault, but they’re doing something about it, and doing it really well!”)
- More relaxed working for drivers and control centre staff

LIO’s route diagram view during a disruption: Routes 10 and 61 are split and operate with two short turns each. Routes 11 and 14 are running on a detour, serving alternative paths. Additional stops are temporarily added along these routes (highlighted in pink).

Example of a geo path dispatch: At stop MEHA, the dispatcher defined the exact path for the short turn, which is then navigated accordingly in the vehicle.





Example of a street search in the GIS: This search is available not only within the GIS module but in every view. The map on the left also shows several geo-based disruption zones from IDS-Plus (highlighted in blue). From these zones, the corresponding action plans can be accessed directly.

Measures for proactive preparation

But what does this optimum preparation look like in detail? What can the data supply and dispatch staff do?

What can be prepared in the data supply?

- Create planned path dispatches with: dispatch pattern groups, dispatch pattern definitions, paths for short or long turns and diversions with the right entry and exit points, destination signage, screen content for the vehicles, automatic announcements with information about the situation or alternatives, track switch destinations, travel times, dwell times and layover times, traffic light preemption etc.
- Proceed with “routing” of paths for the navigation
- Define geo incident zones
- Save canned announcements to be made to passengers, possibly using Text-to-Speech
- Supply additional geo-based TLP trigger actions for path dispatches subsequently created ad hoc by the control centre

How can the control centre prepare for incidents?

Create predefined actions for:

- Planned and spontaneous path dispatches such as short or long turns, diversions, intermitting, inserting
- Geo path dispatches
- General special texts and special route texts for passenger information at stops and in vehicles
- Adapted special texts – if deviating – for sending from VDV736 and for social media platforms
- Additional positional triggers for informing drivers and/or passengers
- Automatic announcements with information about the situation or alternatives; created and saved for example by recording, Text-to-Speech or importing external digitized speech
- Switch commands for deactivating trip announcements
- Set up time control and periodicity
- Create incident definitions, action plans and possibly manual tasks, and link geo incident zones
- Use VDV455 Part B standard duty roster interface; monitor critical relief situations, with efficient “sorting back” of drivers after the incident

ebblo solutions for all incidents

From the basic functions to the full version

ebblo stands for first-class expertise in urban public transport, and offers solutions that guarantee smooth operations. With innovative systems and functions, ebblo enables secure handling of planned and unplanned incidents in the operational workflow, setting standards for coping with daily challenges.

The following sections explain which basic functions ebblo provides for effective incident management, and how workflows and results can be further improved with a broad range of add-on functions. Every additional function boosts handling efficiency, increases the resulting time savings and enhances the quality of the passenger information. It is also made apparent that the incident will have far less impact if action is taken quickly.

1. “Indispensable basis”

The first group of functions consists of the indispensable basis for controlling passenger information and path dispatch with an operations control system LIO by ebblo. These are the functions that the control centre needs for every incident to proceed with repeated ad hoc initiation of all individual measures, with a huge time factor or losing huge amounts of time.

LIO functions level 1:

- General special text
- Time-controlled actions
- Announcement from sound card
- Deactivate block on DPI or new trip cancellation
- Spontaneous path dispatch
- Positional triggers
- Time-controlled announcements
- Trip-specific text
- Action priorities

2. “Well prepared, less stress”

The second group of functions makes it possible to ascertain incident situations in advance and put them in groups. As a result, the functions can be activated quickly when an incident occurs, with the same actions and communication in each case for identical/similar incidents. The preparations can be carried out during incident-free times for a steadier workload in the control centre. The time invested in preparation is then saved when an incident occurs, which is beneficial for the workflows, with direct benefits also for the passengers.

LIO functions level 2:

- Predefined actions
- Trigger multiple predefined actions

3. “More operating convenience, better passenger information”

The third group of functions clearly improves user convenience in the control centre and allows for more detailed passenger information. By structuring and pooling actions, the Incident Manager facilitates far more efficient handling of incidents in all phases. Actions are activated at a faster pace and take effect more quickly for both drivers and passengers. More journey capacity remains productive because the problems are not escalated. Once the incident is over, fewer vehicles and less staff have to be dispatched or replaced as they didn’t enter the disrupted section in the first place.

LIO functions level 3:

- Planned path dispatch
- Path dispatch G2 advanced
- Geo path dispatch
- Duty roster interface
- LIO-IDS Incident Manager
- Text-to-Speech announcements from the data supply
- VDV736 interface for incident messages sent from the AVLC

4. “The optimum”

The functions of the fourth group allow extended graphical views and operating options in the control centre which can be very useful in changing incident situations, such as a protest march. Furthermore, they make it far easier for new dispatchers to understand and do the work. Acoustic passenger information can be further upgraded with neural voices or with Text-to-Speech directly integrated in the control centre, thus achieving optimum efficiency and quality.

LIO functions level 4:

- IDS-Plus
- Planned path dispatch in GIS
- Patterns in GIS
- Street search in GIS
- Object groups
- Geographic trigger (Geofence)
- Text-to-Speech announcements with neural voice from the data supply
- Structured passenger information with Text-to-Speech integrated directly in the control centre

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