



Station management at Network Rail London Bridge station between January and March 2015

August 2015

Summary

London Bridge (LBG) mainline station experienced crowding several times between January and March 2015. In particular, the events of the first week of January, and 3rd March were widely reported in the media and resulted in high-profile commitments by Network Rail to resolve problems.

Inspectors from RSD carried out a series of inspections of Network Rail's station management arrangements. These inspections included the role of Southern Trains on the management of the suburban platforms. The inspections had 3 aims:

1. Investigate whether the events of 3rd March represented a failure to manage safety at LBG.
 2. Assess the day-to-day operation of LBG.
 3. Assess the interaction between the Thameslink Programme and station operations, involving a wider consideration of NR's management of change.
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1. Investigate whether the events of 3rd March represented a failure to manage safety at LBG

The problems on Tuesday 3rd March 2015 included an attempted suicide blocking all lines in and out of Victoria, a track circuit failure, a reported broken rail leading to disrupted services at London Bridge and passengers being sent to London Bridge from Victoria and Canada Water.

That evening the concourse became crowded, but not overcrowded. CCTV images confirm this. When the concourse became more crowded, the doors to the station

were closed and a 'snake' arrangement of barriers was put in place outside the station. Approximately 20 Network Rail staff were on hand to manage passenger movement. Localised crowding took place on the 'ticket office' side of the gateline.

At around 17.40 the Southern team leader shut the interim gateline (one of two gatelines leading to the Southern platforms) and the 3 Southern staff positioned there removed themselves, citing fears for personal safety. This was apparently the result of some abuse directed at staff by a few frustrated passengers awaiting trains. The other gateline remained open. Network Rail report no communication from Southern staff, but this is contested by Southern.

At about 17.53 passengers started to jump the interim gateline. British Transport Police were on site already (not summoned as previously reported) and they and Network Rail noticed that something was occurring at the gateline. Network Rail then ordered the gateline to be reopened. The gateline had been closed for about 12 minutes. It was crowded but there was no crush behind the gate line at this point and the passengers involved appeared simply to want to get to their trains. There was plenty of space behind the queue for the ticket gates.

There appears to be no foundation to a rumour that the station could not contact the Regional Operations Centre (ROC), that the customer information system was not working, or that announcements were not being made. The design and functionality of the automatic ticket gates was not a factor in events at London Bridge that evening (see below).

In conclusion, although there was a temporary failure to manage the gateline, there is no evidence to suggest that there was a risk to passengers on the concourse at the time. That said, there is always the risk that an unrelated event could have caused a sudden movement in the crowd which could have created risks. ORR inspectors investigated the management arrangements at LBG on the day of the incident, and assessed the station's emergency plan. We found that the following matters affected the way in which the disruption was managed:

- The decision to close the ticket gateline was undoubtedly the wrong one. Although taken for understandable reasons, the decision created a situation in which passengers could have been exposed to risks from crowding. In a busy station with a high throughput of passengers, the use of gatelines to control passenger flows should be avoided unless there is a risk of platform congestion, and even then only as a last resort. It would be more preferable to close the station to new passengers. On the evening of 3 March the local crowd control plan was not correctly followed in this respect.

- There is some doubt about the level of communication between Southern and NR at the time. Busy stations need to be well managed at all times and this includes having clear lines of command and control. Also, a lack of coordinated control resulted in a delay in getting a message to Victoria station (where there was serious disruption) to stop directing passengers to LBG.
- There is also some doubt about the extent to which senior managers were aware of the problems at the gateline before they were spotted by concourse staff and BTP officers. A well-managed station should be constantly monitored for incipient crowding and disruption so that problems are not allowed to develop into risks to passengers.

Our review of NR's pedestrian flow modelling, emergency plan and local crowd control plan concluded that they utilise reasonably accurate numbers for modelling passenger flows, set out responsibilities for all staff during an emergency, identify a range of potential local hazards arising from the redevelopment (for example propane cylinders) and have been frequently updated to reflect the changing nature of the station layout (for example the introduction of country-end platform emergency exits).

Actions taken post-incident

NR & Southern reviewed their management of the incident and undertook the following actions, partly at ORR's prompting:

- Revised the station emergency plan following an independent review
- Timetable revision to allow for quicker recovery in the event of disruption
- Improved management structure during disruption for coordinated decision making between London termini
- Provided better train information to customer information staff on the concourse
- Improved joint working between NR and Southern; daily joint briefings, plans for NR & TOC staff training in conflict management and customer service
- Improved information from LBG to the ROC
- More customer information screens
- Agreement that the gatelines would not be closed for crowd control purposes and only senior managers would take major decisions.

2. Assess the day-to-day operation of LBG

ORR inspectors have visited LBG several times since March to see how the station is managed in the evening peak. The visits found that there were adequate staffing levels, appropriate management arrangements and good levels of passenger

information. On one visit (1st May), the station was facing the most serious disruption since 3 March. Throughout the evening peak, despite many cancellations, widespread delays and extra passengers diverted from Victoria (which was seriously disrupted), the operation was handled well, with diversions working well (the Arches entrance to the station from LU was closed) and staff were very visible and proactive. There were blocking problems at the exit of LU into the arches because of the positioning of CIS screens (the first passengers see of the delays) directly outside the LU entrance. This was reported to the station manager during the inspection.

Our continuing monitoring suggests that the arrangements at LBG are sufficient to ensure the safety of passengers. However, we will continue to monitor management at the station.

3. Assess the interaction between the Thameslink Programme and station operations, involving a wider consideration of NR's management of change

London Bridge is currently undergoing a major redevelopment consisting of changes to the track layout, signalling arrangements and station facilities. These works are due to finish in 2018.

In order to complete this work, Network Rail have taken a number of blockades, closing parts of the station and services to and from the station on weekends and in particular over the Christmas and Easter holiday periods.

We identified the following as contributory factors to the disruption at LBG in the first week of January 2015:

a. Signaller training & layout changes

The relocation of signalling to Three Bridges ROC, layout changes, and the introduction of new technology (VDU screens rather than panels) meant there were an abnormal number of wrong routings because there are now more bi-directional lines. The simulator, on which signallers had received training on the new layout during the works, did not exactly reflect the layout and timetable, and did not simulate the types of problems faced by signallers in the first few days of operation. Consequently, signallers found the new layout difficult to operate at first.

The new layout opened with 'proving' speed restrictions 10mph lower than line speed. This in itself shouldn't have been too much of a problem, except that drivers

at first were driving slowly over an unfamiliar layout on bi-directional lines (where drivers can potentially come up against another train in the event of a signalling failure, something that led to cautious driving initially), leading to a much slower service, and, crucially, much slower incident- recovery. This unfamiliarity was predictable and should have been factored into planning.

b. Infrastructure failures

Failures of newly-installed points occurred on a daily basis, mostly at Bricklayers Arms Junction. It is believed the longer switches (type E in-bearer clamp lock) are taking a lot of power to push over and require adjustment as they settle. The equipment is working at its operating limit. Before installation, they were tested at the manufacturer's yard, with no issues identified. We were told that 500 sets have been installed around the country with no similar reported problems.

The area experienced failures of newly-installed track circuits every day, including two failures on the first morning. There was some suggestion that the traction return frequencies from class 442 EMU's may be a factor, but of 164 new track circuits, failures appeared randomly, weakening the idea of a link between the failures and rolling stock.

The project undertook testing before re-opening the network but it did not identify any problems. It is likely the problems only manifested themselves under intense use. Investigations into the causes of the failures were on-going when our inspections were continuing. A period of 'working-up' might well have identified these failures before they created the problems seen at LBG.

Once the post-blockade disruption occurred, having a single customer information display adjacent to platforms 13-15 meant that passengers congregated in a small area. There is some doubt about whether Southern and NR discussed and agreed the removal of the other information board, but it seems to have been removed because of its proximity to escalators bringing up passengers from street-level entrances and from the London Underground station. With the benefit of hindsight this was the wrong decision. But at the time, all parties were right to consider the risks of injury from passengers prevented from getting off an escalator by crowds of people. However, it should have been foreseen that, as a result, passengers would congregate in a small area instead of using all the available space on the concourse. This raises questions about how risks are assessed and key decisions reached as a result of on-going changes at the station during the Thameslink Programme.

c. Timetabling problems

The track layout was modelled extensively, and allowed for 24 trains per hour at peak times. This worked well in the morning peak. The timetable in the evening peak, which was busier than the morning (80 arrivals as compared to 66 in the morning), created difficulties in that it allowed no recovery from delays or operating problems; a delay on one service would steadily cause delays to accumulate elsewhere. Timetable modelling did not identify these potential problems. Had it done so, NR could have taken the action it took subsequently to simplify the timetable to make it more robust. As it was NR cancelled 6 services and stopped some trains being split in the platform so as to free-up platforms.

d. Handback process

We have not identified any weakness in the process for handing back the station from the Thameslink Programme into operational use after the Christmas blockade. Properly-managed, there is no reason why there should be problems. However there can be no doubt that the number of changes; to track, signalling, station operation and station layout, meant that the failure of any one element would affect the performance of the system as a whole. Accordingly, there was an increased risk of failure(s) with potential knock-on effects.

The decision to hand back the station directly into a working day morning peak meant that there was no 'working up' time in which to identify problems. Doing so might have identified timetable problems, and allowed drivers and signallers the opportunity to gain some familiarity.

Conclusion

Our investigation has not found any evidence that people at LBG were put at risk. Since the incident, NR and Southern have learned from the incidents and made a number of changes designed to improve management at LBG. Some of the changes are matters that could have been put in place to better manage risks that were largely foreseeable. The events show the importance of robust risk assessment and planning, and the importance of unified management of large stations to maximise passenger throughput and effective crowd control. The events also show how the vulnerable the station is to managing disruption occurring after significant changes. NR and the train operating company should consider whether changes and re-opening dates could be timed to avoid re-opening into full peak service. These conclusions, and those mentioned above are aimed at preventing a recurrence and/or improving the management of LBG during disruption.

Appendix

Time line of events of 3rd March:

1624 – Person hit by train at Balham causing severe disruption at Victoria (VIC) and knock-on disruption at London Bridge (LBG). Large customer numbers opt for London Bridge as alternative route

1704 – Concourse busy, Station Incident Officer (SIO) contacted VIC to request customers not redirected to LBG.

1705 – Crowd control plan implemented with Vaults closed. Reduced number of ticket gates on entry

1715 – Piazza queuing system implemented, working and fully operational but very busy

1722 – Route Control informed by SIO that station was busy

1740 – Disorder on ticket office side of queuing system. Interim gateline closed.

1745 – Disorder on Shard side of queuing system; system compromised and unrestricted entry established through 'exit lane'. This also causes issues at closed interim gateline

1750 – Concourse doors closed to reduce congestion on concourse

17.53 - Passengers start to jump interim gateline.

1755 – Route Control advised of developments by SIO. At this time the manual gate on the interim gateline is reopened

1802 – Concourse doors reopened to allow restricted entry

1806 – Interim gateline reopened with limited entry gates

1810 – Exit lane reinstated and station fully operational but busier than usual

1945 – Vaults reopened

Performance of ATGs

Concerns were raised after 3 March that the performance of the ticket gates, and the lack of availability of contactless payment, may have contributed to the congestion – slowing the flow of passengers. While there is no evidence that this was the case on

the evening of 3 March, NR should ensure that it keeps abreast of technological developments in ATGs in order to optimise efficient and safe passenger flows through gatelines. The current situation is as follows:

All gated Southern stations and NR managed stations where Southern operate, including London Bridge, have 'smart' gates. These have the following functions:

- The gates remain open if there is constant flow of passengers touching or inserting tickets. If a gate has started to close when the next ticket is presented the gate will open without having to complete the closing cycle;
- All gates accept some type of contactless payment;
- In the London area ATGs accept Oyster cards (season tickets and PAYG) and contactless cards (debit cards and credit cards which charge Oyster PAYG fares).

ATGs were observed on all p.m. peak inspections and filmed on an a.m. peak inspection, and were seen to be operating as designed. Gates stayed open so long as each passenger presented their ticket immediately after the person in front. However the gates did close when passengers struggled to have their ticket ready in time, or when the gate rejected the ticket, in both cases normally with a paper ticket. The continued spread of contactless cards should increase flow rates further, and advances in ATG design will further smooth passenger flow.

Emergency plan review

ORR met with NR's Senior Station Capacity Planner and London Bridge NR management team to discuss the modelling and analysis underpinning the emergency plan. Topics discussed included:

- Pedflow analysis for normal/perturbed am/pm peak
- Emergency evacuation by platform
- Crush loading for 12/8/4 car
- Clearances on island and side platforms to hoardings
- Increase widths if possible
- Platform length and escape at country end
- Intermediate escape points
- Interface with Victoria and other London termini and other interchange points e.g. Clapham Jct.

In general we are satisfied that that the right data is being used and appropriate measures are in place to manage the ever-changing passenger flows. We were

satisfied with the pedflow analyses although some of the loading data was a little on the low side.

Use of the name, the Office of Rail and Road, reflects the new highways monitor functions conferred on ORR by the Infrastructure Act 2015. Until this name change is confirmed by legislation, the Office of Rail Regulation will continue to be used in all documents, decisions and matters having legal effects or consequences.



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