



# **LNER Station Stop Surveys**

## **Presentation to the IRO**

### **South East area**

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# The Railway Consultancy

- Founded in 1995
- Based in Crystal Palace station
- Commercial & operational planning
- Have worked for almost all TOCs
- Work internationally, including benchmarking with Imperial College
  - Have been able to isolate & quantify the impacts of many variables on passenger movement times at stations
- 'Forensic' train service planning
  - Detailed analysis of sub-threshold delays



# Previous RCL work for LNER

- Our fieldwork measured
  - Detailed timings of all processes (doors, passengers, despatch...)
  - Counts of all passenger movements at critical door
  - Background info e.g. platform & train characteristics
  - *Reasons* underlying sub-threshold delays
- Surveys carried out at Grantham, Newark, Durham & Berwick in 2018
- Problems can arise from big or small issues with
  - Infrastructure deficiencies
  - Timetable structure & its implementation
  - Rolling stock features
  - Staff
  - Passengers



# LNER's Three Questions in 2019

- How are Azuma trains performing, in terms of station stops?
    - Grantham used as a control against previous work
  - What is going on at Peterborough & York?
  - What should LNER do about it?
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- Plenty of data – but what's actually going on?
  - Major events excluded (picked up by management, or 6-sigma analysis)
- Concentration on the frequent small delays

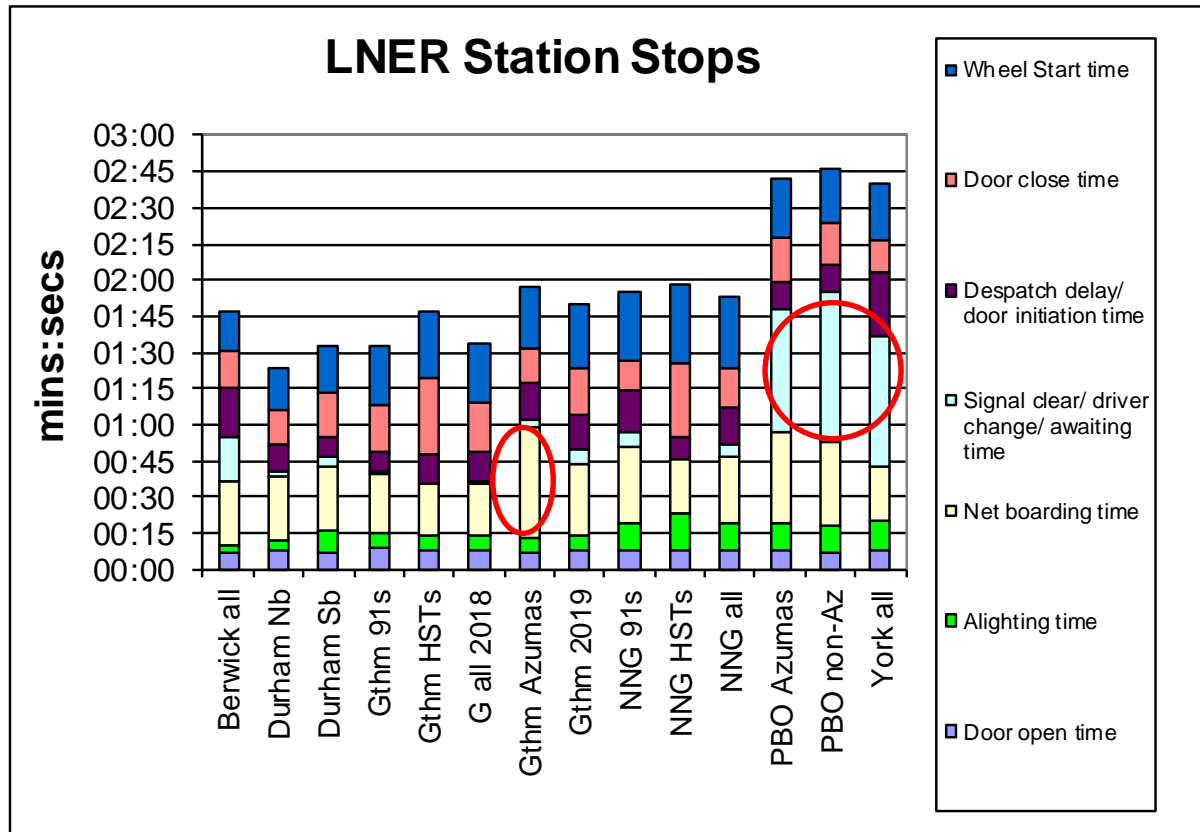


# Summary of Results

- Detailed operational research surveys during Oct 2019
- All stations showed
  - average stops exceed planned allowance
  - some instances of severe delays
  - non station-related delays as well as actual dwell time problems
- Variability is as unhelpful as excess
- Adjust for time spent awaiting booked time (typically 30s at PBO & YRK)

|                        | Peterborough | Grantham | York |
|------------------------|--------------|----------|------|
| Sample size (all TOCs) | 75           | 78       | 55   |
| Rules of the Plan (s)  | 120          | 90       | 180  |
| Ave. booked dwell (s)  | 145          | 100      | 176  |
| Achieved (s)           | 158          | 111      | 183  |
| Maximum (s)            | 612          | 453      | 675  |
| % OK                   | 58           | 56       | 56   |
| so % not OK            | 42           | 44       | 44   |

# Disaggregation of Results



- Note the extent of signal clearance/awaiting time at PBO & YRK
  - typically 15s & 30s respectively
  - but 35s signal clearance for non-Azumas at Peterborough
- ...and the boarding times associated with Azumas when busy



# Infrastructure

- Trackwork
  - Flat junctions in station throats e.g. York
- Signalling
  - Some restrictions on platform entry speeds because of inadequate overlaps
- Information
  - Train orientation & even type not accurate



# Rolling Stock

- Variation in train types
  - Hence stopping positions
- Steps into/out of Azumas
  - Big enough to avoid undue delay (although don't help)
- Ramps
  - Much slower deployment on Azumas
- Cupboard Labelling!





# Traincrew

- Slow wheel starts – why?
- Freight train driver change-overs



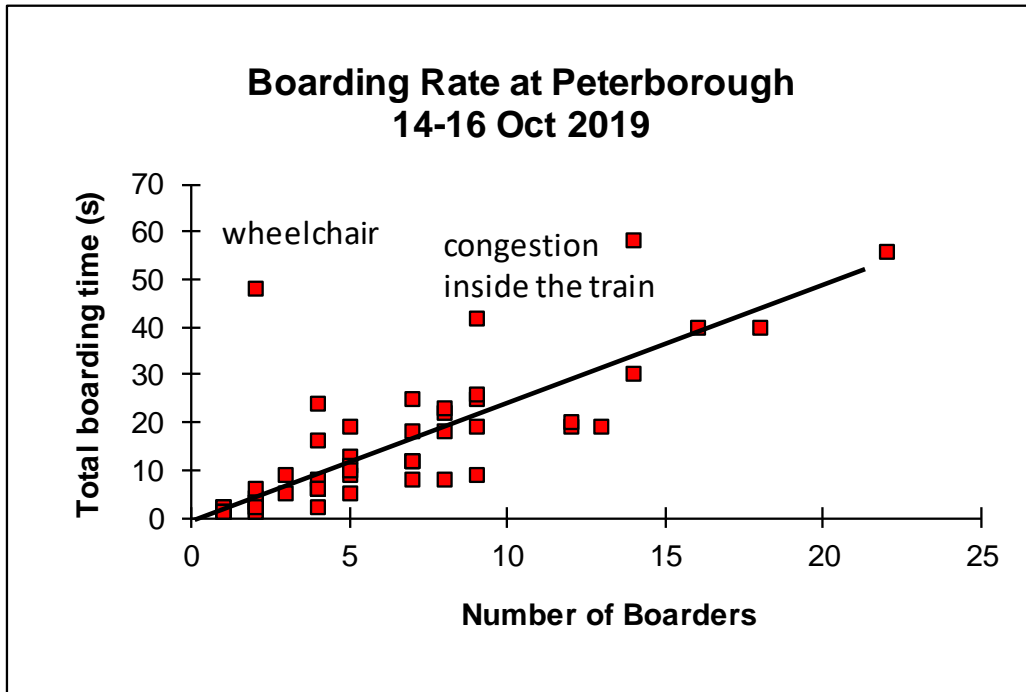
# Platform Management

- Platform staff delays minimal
  - Provided that the booked staff are available
- Platform crowding problem, preventing dispatch
  - Spreading boarders out is critical, but alighters obviously converge towards exit
- Assisted travel: time with ramps, no advance notice



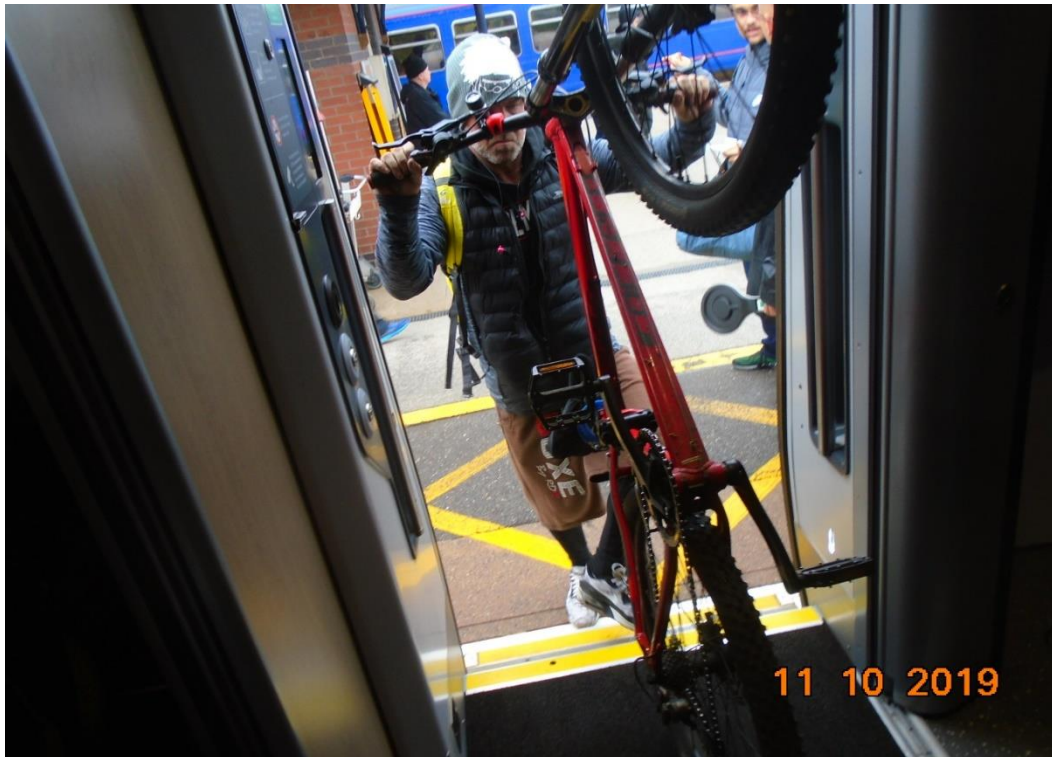
# Passenger Flow

- Movement rates low (as expected):
  - Low platforms/gap
  - Steps into the train
  - Infrequent passengers
  - Luggage (more space sensible)
  - Busier trains
- Increasing loads & load factors not helping



# Bicycles

- Less space in Azuma than in Mk IV/HST van (takes longer)
- Loading/unloading conflicts with passenger flows
- Varying (Azuma + other) train types mean that bicycle space varies along the platform





# Train Service Regulation

- Appears to be a big problem
- Many instances of trains prioritised in sub-optimal way, or plan not adjusted
- Possible explanations include
  - ARS-driven (and ARS difficult to reprogram)
  - Staff error
  - Insufficient number of staff to manage quantity of trains running out of course
- Doesn't seem to be a good understanding of
  - blocking times or
  - consequences (knock-on delays)



# York example 23/10/19

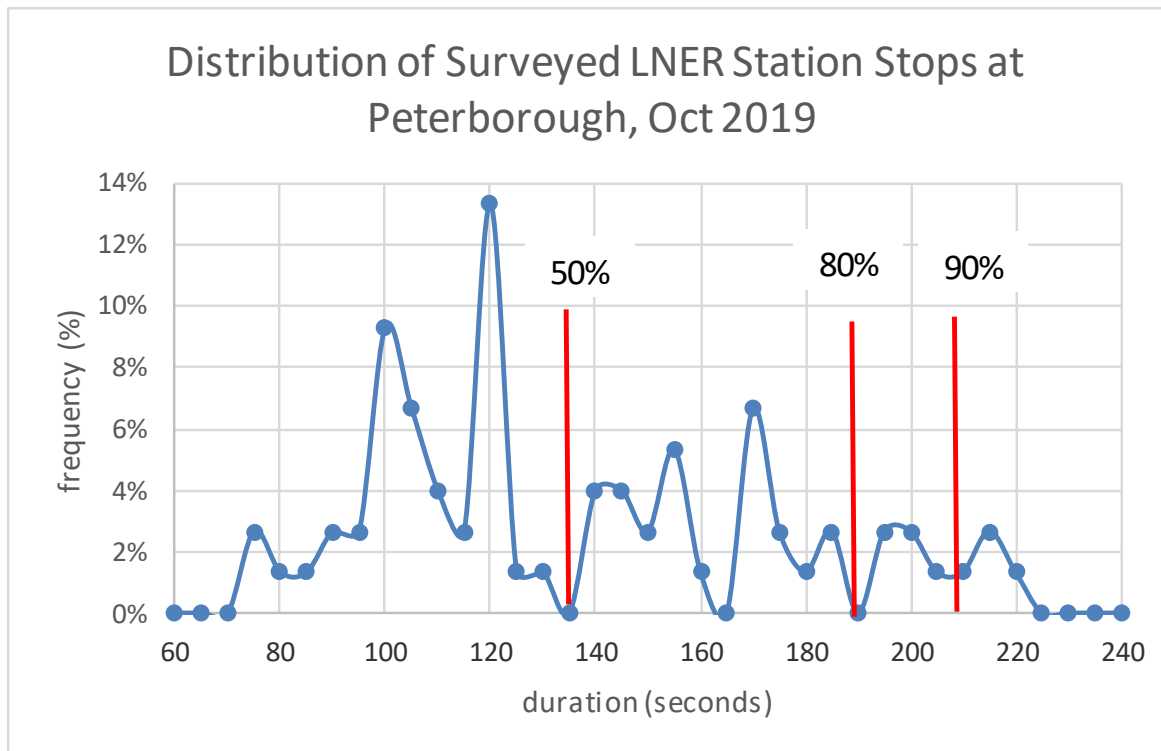
- Total of 6 mins' knock-on delays caused to 1E07 from decision at York
- All other through platforms empty, caused other knock-on delays
  - was (appropriate) action of previous hour just copied?

|      |         | plat | Booked   |          | Actual   |          | Notes  |
|------|---------|------|----------|----------|----------|----------|--|
| 1P19 | MIA-NCL | 11   | 11:02    | 11:03    | 11:07:45 | 11:09:15 |  |
| 1E07 | EDB-KGX | 3-11 | 10:55    | 10:57    | 11:12:45 | 11:16:02 | Unnecessary 4-min delay on entry, 2 mins on exit |
| 9M08 | NCL-LIV | 9    | 11:07:44 | 11:09:20 | 11:15    | 11:18    | consequential knock-on                           |
| 2C33 | YRK-LDS | 8    |          | 11:11    |          | 11:15:15 | consequential knock-on                           |
| 9E09 | LIV-NCL | 10   | 11:16    | 11:19    | 11:18:45 | 11:21:15 | consequential knock-on                           |



# Timetabling allowances

- Not convinced that planning process takes due cognisance of blocking times
- Real problem is variability of station stops
- We would argue that 80-90% of occurrences should occur within allowance
  - e.g. Peterborough should have 3 mins for all trains





# Selected Results

| Impact of                                      | Peterborough | Grantham | York |
|--|--------------|----------|------|
| Low platform heights                           | -10          | -7       | -18  |
| Poor passenger distribution along the platform | -4           | -8       | -10  |
| Train regulation & signal clearance            | -23          | -3       | -16  |
| Train manager out of position                  | -1           | -3       | -1   |
| Passenger assistance                           | -3           | -7       | -1   |
| Large luggage                                  | -3           | -2       | -3   |
| Bicycles                                       | <-1          | -4       | -1   |

- All figures are impact in seconds
- -ve implies issues which made punctuality worse by leading to an increase in delay



# Conclusions & Recommendations for LNER

- Genuine problem with excessive & variable station stops
- Multiple reasons
- Knock-on delays en route are exacerbating any problems in stations
- Recommendations passed to LNER for implementation include
  - Timetable adjustments
  - Discussions about regulation policy
  - Improvements to the provision of information, luggage & cycle handling
  - Encouragement for York North remodelling (separate egress from platform 11)
  - Adding stickers to the staff cabinets within Azumas
  - Changes to the location of FOC driver changes at Peterborough