



Issue **APRIL** **The T & R UPDATE** **91** **2016**

GETTING READY FOR POLYMER NOTES

There aren't really any main headline making items within the scope of the May Fares Revision changes, so this month our focus is mainly on forthcoming changes to methods of payment.



BANK OF ENGLAND

You may be aware that in **December 2013** The Bank of England announced plans to introduce new designs of the £5 and £10 note in **2016** and **2017** respectively. The bigger news story however, was that these notes would be the first to be issued by the Bank of England on polymer, rather than being traditional paper notes.



On **Page 8** inside, we take a first look at what Polymer notes are and why this change is being made. Over the next three editions of **TRU**, in the run up to the public launch of the new £5 note in **September 2016**, we will also take more in depth looks at what the new notes will look like, their security features and our plans to convert our existing equipment to accept the new notes.

Having invested heavily over the last couple of years to install new Cash Handling Devices at over 100 stations and to also add Bank Note Recyclers to around 100 of our busiest MFM's, all of these devices will now need to be made ready for the introduction of the new notes.

In addition to this change which will take place later this year, on **Page 12**, we provide an update on plans to raise the maximum bankcard transaction limit on POMs and on **Page 16**, we have a further update on recent progress on a project to replace the Chip & PIN units on all of our POMs.

Finally on **Page 3**, we also provide information on a further addition to the range of options available to customers wishing to use contactless payment for their journeys.

IN THIS EDITION

IN THE NEWS

Pages 1-5 → Time change →
Contactless payments → May
Fares Revision

ASK OLLY!

Pages 6-7 → Your letters answered

SPECIAL FEATURES

Page 8-9 → Polymer banknotes →
Spring clean Pt I

PROJECT UPDATES

Pages 10-15 → LCP upgrade →
Safe changes → POM software
upgrade → CHD rollout →
Device monitoring app

LATE NEWS

Page 16 → Chip & PIN upgrade
→ Looking ahead to TRU92 →

TRIVIA - Pages 2, 3 & 5

Answers on Page 15

KEY STORIES INSIDE

Page 3 MORE CONTACTLESS OPTIONS

In May, the range of options for making contactless payments for travel will be expanded with the launch of Android Pay for customers with Android smartphones.

Page 5 MAY FARES REVISION

We provide an overview of some of the changes that are due to be made as part of the next fares revision on Sunday 15 May and news of the re-opening of a station in Zone 3.

Page 12 POM SOFTWARE UPGRADE

We look forward to the first of a number of software upgrades which will address a number of issues identified by staff since the introduction of the Oyster refund software and BNR on the MFM.

Pages 13 CASH HANDLING DEVICE ROLLOUT

We bring you up to date on the rollout of CHDs to more stations and some of the changes that have recently been made to the devices to improve them.

Page 14 DEVICE MONITORING APP

We update you on a new iPad app that will allow staff to monitor the status of POMs and gates and report faults to Cubic, which will soon be available to use.

ALSO INSIDE...

LAL MXIDE PU

**WHERE'S
WOLLY?**

**DID
YOU
KNOW?**

Ticketing & Revenue
T&R
Trivia

GMT TO BST TIME CHANGE

The twice yearly adjustment of clocks to and from British Summer Time (BST) is now a well-practiced operation for both LU and Cubic, although there is always a risk with any such change, that one or more will not switch over at the designated time.

The spring switch from Greenwich Mean Time (GMT) to BST on **Sunday 27 March**, this year also coincided with the Easter Bank Holiday weekend and the added complication of devices using special bank holiday tables on the Friday before the change and again on the Monday after.

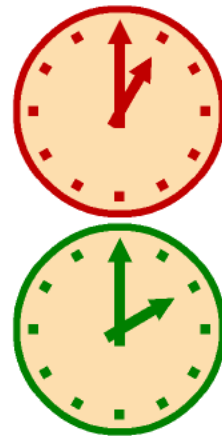


The switch went exceeding smoothly, with no reports of any devices failing to respond to the time change and no issues with stations being offline, as we have had on occasions in previous years.

The on-going delays to the implementation of Night Tube operations, which were originally scheduled to commence in September 2015, means that we are yet to implement a time change whilst we are operating through the night services.

This will give us some additional complexities, in that there will be some customers who will potentially be in the middle of a journey when the clocks officially change. This could mean that customers would finish their journey before the recorded start time when the clocks go back in the autumn, or potentially exceed the maximum journey time when the clocks go forward.

These scenarios have already been tested during the extensive testing of the ticketing changes required for Night Tube last year. Hopefully with a potential launch of some of the Night services on the Tube later this year, this will be a topic that we will revisit in a future edition of TRU.



NIGHT JOURNEY FIX FOR NR TVMS

One issue identified during testing of the ticketing aspects of Night Tube, was that NR TVMs switched from one day to the next at midnight, unlike our devices which switch date at 04.30 (our End of Day).

This meant that if a customer presented an Oyster card with a season ticket due to expire at end of traffic to top-up or check their card after midnight, the season ticket would be viewed as having expired and be cancelled, even though it was actually valid until 04.30.

After a number of protracted delays due to some contractual issues between suppliers, one of the two TVM suppliers have now implemented a change to their devices to prevent tickets being cancelled prematurely. ATOC hope that the remaining devices will be upgraded shortly.

WHERE'S WOLLY?

In our haste to finally get the much delayed TRU90 to print the week before Easter and accommodate a couple of very late news items, we cut the first of our Trivia items and with it the instructions for our new *Where's Olly* feature. So this month we will try to explain it a little better...

Below are 5 clues to a station Olly has visited this month. Guess the station after the first clue and award yourself 5 points, 4 points if you require the second clue and so on until after the 5th and last clue you get just 1 point.



Answers on Page 15

If you still haven't guessed after all 5 clues then it is "Nil Point".

Points	I'm at a station which...
5	is on the borders of Zones 1 & 2 and served by two lines
4	is also a busy interchange with National Rail and buses
3	has 2 separate entrances and 2 gatelines
2	is the terminus of 1 line, but it wasn't planned that way
1	has quite a few lifts but not a single escalator

Ticketing & Revenue
T&R
Trivia

MORE OPTIONS FOR CONTACTLESS USERS



In the next few months Google will be launching their own contactless payment app “Android Pay” in the UK. The exact launch date is yet to be confirmed, but is currently scheduled for **mid May**.

It will be accepted for pay as you go travel just like all other current contactless payment cards and devices.

Customers with a compatible android device will then be able to link a payment card to the Android Pay app, so they can then use their phone to make contactless payments.

Revenue Inspection Devices (RIDs) will not be able to recognise Android pay until after a software release scheduled for **Summer 2016** and if presented to the RID before then will show a “CARD READ ERROR” message.

In order to mitigate for this, the app features a real time tap history called “recent transactions” which can be viewed on the phone. This will enable inspectors to determine whether the customer has touched in and out correctly. The app (illustrated right) will display;

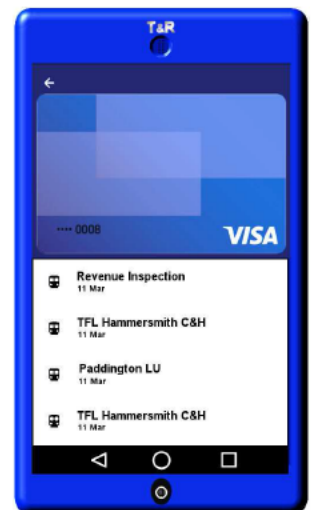
Date	Time	Entry station
Exit station	Bus route number	Revenue Inspection taps

When conducting inspections, RCIs should request to see the user’s “recent transactions”. If required they can instruct customers to:

- *open their Android pay app,*
- *tap the card they wish to use to pay for their journey,*
- *show their “recent transactions” to the RCI.*



If no visible journey history is shown for the journey the customer is making, it may be assumed no validation has taken place and a Penalty Fare may be charged.



The conditions of use and operation will be very similar to the other smartphone based applications such as Apple Pay. As with phone based NR tickets, the onus will be on the customer to ensure they have sufficient battery life to complete their journey and to be able to show confirmation of their ticket or validation if requested by a revenue control official.

Like contactless payment cards, it will not be possible to view card or journey details on a MOVie device or POM screen.

THE KEY POINTS



▶	Launch planned for Mid-May 2016
▶	Customers will link a payment card to the app and then use their phone for contactless payments
▶	Customers must touch in and out with same device for all journeys to get the benefit of PAYG capping
▶	Initially not readable by RID, but customer can show recent transactions on phone screen
▶	Onus on customer to have phone charged to validate

LAL MXIDE PU Part I – We’ve mixed up the letters in these station names. Can you work them out?

Ticketing & Revenue
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Trivia

(a)	(b)	(c)	(d)	(e)

Answers on Page 15.

ANY SPARE VAULTS?

The recent deployment of the final AFMs and a number of MFM's from store, has resulted in the stocks of spare vaults held by Cubic being severely reduced.

Recent visits to several stations has highlighted that a number had surplus coin and note vaults. We have since arranged for these surplus vaults to be collected by Cubic.



All stations should have spare vaults based on the following criteria;

- **COIN VAULTS**
 - a) Where there are between 1 and 4 POMs (excluding QBM's), one extra coin vault shall be provided.
 - b) Where there are 5 or more POMs (excluding QBM's), two extra coin vaults shall be provided.
- **NOTE VAULTS**
 - a) Where there are between 1 and 4 MFM's, one extra note vault shall be provided.
 - b) Where there are 5 or more MFM's, two extra note vaults shall be provided.

Please let us know if your POM Room:

- *does not have at least one spare coin and note vault*
- *does not have sufficient spares as shown in the table above*
- *still had conventional NHU note vaults even though MFM's now have BNR units*
- *have any broken or damaged vaults which need to be replaced*
- *have any coin vaults that do not have stickers to indicate they have been "Overhauled" (as circled in the image on the right).*



NEW YELLOW PTACS FOR GOVIA STAFF

TfL have recently completed negotiations with Govia Thameslink Rail (GTR) to extend the Yellow TfL PTAC scheme to include Govia employees of GTR including those employed on the former Southern franchise.



Previously the scheme covered First Capital Connect (FCC) staff, before these routes were refranchised and absorbed into the new much larger franchise, now operated by GTR.



The new cards will start to be issued to eligible staff and dependents from **Sunday 01 May**.

Holders are entitled to have the "Priv TfL Rail" discount added to their Oyster card, which enables the holder to use PAYG on TfL services, but prevents the holder being able to buy a Privilege Season ticket or use NR services.



A similar reciprocal deal with Eurostar, will also see the issue of similar yellow PTACs to their staff, to enable them to use PAYG at privilege rate on LU. A previous arrangement had allowed Eurostar staff to purchase TfL Rail only Privilege season tickets, but the withdrawal of this product when Privilege season tickets were migrated onto Oyster, has led to the need to switch eligible staff to using PAYG instead.

Further details of the scheme can be found in **T&R Book 2 Section 5**. This will be updated at the next reprint to reflect the extension to Govia / Southern staff and include an updated PTAC image.



Holders presenting yellow TfL issued PTACs must only have the Priv TfL Rail discount added to their Oyster card.

MAY FARES REVISION

PREVIEW

The next Fares Revision is due to take place on **Sunday 15 May 2016**. The forthcoming London Mayoral election has put the brakes on any major changes being implemented, so as a result this revision will be relatively low key, with only a few significant changes.

The main changes to be aware of are;

- A new "PRIV NR Only" Oyster Discount entitlement will be added to devices in readiness for implementation at a future date. This discount will be available to TOC staff and their dependents who are not eligible to full Privilege facilities. When implemented, it will give them a discount when using Oyster PAYG for leisure journeys on NR services. The discount will not apply to journeys on LU or through journeys between NR stations and LU. LU staff and stations will not be involved in the setting of this discount.
- There will be some minor changes to a small number of unregulated NR magnetic ticket prices, which are set by the TOCs concerned.
- POMs will be able to issue magnetic extension tickets to Chiltern stations north of Amersham in connection with a Zones 1-9 Travelcard on Oyster. The range of extension tickets to other NR stations outside of London will also be further expanded through the extension to additional stations. The Oyster card holder must currently have a Travelcard that covers Zones 1&2 to use this facility.
- Introduction of Contactless Payment for PAYG journeys on River services.
- Changes to Entry/Exit charges on Gatwick Express gates at Victoria to deduct the higher Gatwick Express fares for customers entering or leaving these platforms.

May 2016
SUNDAY
15
MAY FARES
REVISION

BACK ON THE MAP



One of the changes being implemented as part of the May Fares Revision is to facilitate the opening of a new station **Lea Bridge**, served by the Abellio Greater Anglia services between Stratford and Tottenham Hale.



It isn't actually a true new station opening, as there was previously a station of the same name on this line which originally opened in September 1840 and was served by trains on the BR Tottenham Hale to North Woolwich branch line, until it closed to customers on **08 July 1985**.

The reintroduction of a rail service between Tottenham Hale and Stratford in December 2005 and the subsequent regeneration of former railway land in the Stratford area before and after the Olympics, led to plans for a new station on the site being announced in January 2013.

The station will be situated in Zone 3 with PAYG fares charged on the TfL fare scale. It will appear on an updated version of the PAYG map which will be published online around the time of the Fares Revision.



Ticketing & Revenue

T&R
Trivia

Answers on Page 15

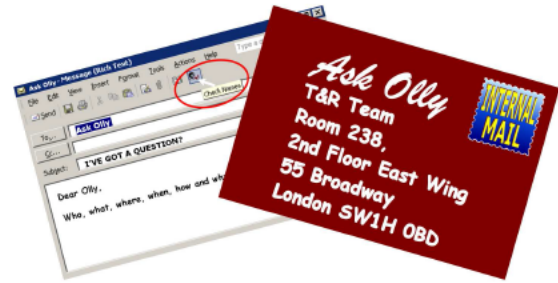
Part 2 – Following on from the above feature... and sorry... there are no clues for this one

Q1)

What was the last new LU station to be constructed and when did it open to customers?

STATION McSTATIONFACE

Luckily there was no online vote for this station name



askolly@tube.tfl.gov.uk

Olly often receives a number of letters concerning the same topic. Recently the most popular issue has been around the use of contactless payment cards for travel. We have included a couple below.

From: [REDACTED]
Sent: 04 April 2016 14:05
To: Ask Olly;
Subject: Contactless Bank Card

Hi Olly,

After long time. Hope you haven't missed me?

Yesterday I was at Newbury Park gate line where we saw a couple using one Contactless Bank card for both of them and it worked in front of us.

First a male customer used the card and went out, then passed the same card to his girl friend. She touched the card and code 42 came up. When we said to her that she can't use the same card she said they have used before it did work. Then she tried after couple of minutes it worked. Is something new has been introduced to systems which we staff not aware of it?

[REDACTED]
[REDACTED]
[REDACTED]

From: [REDACTED]
Sent: 27 February 2016 14:52
To: Ask Olly;
Subject: Glitch or a Fault? On use of Contactless cards

Dear Olly,

It was brought to my attention that Contactless Cards are allowing multiple customer journeys using the same Contactless card.

On Saturday 27/02/2016 my colleague was on gateline at High Barnet where she witnessed a female customer use a contactless card to exit using WAG 21. The female customer then passed the same contactless card to a male customer travelling with her to exit. The male customer tried using the same card but the gate would not open displaying code 42. He tried multiple times WAG gate 21 would not open but kept prompting and displaying error 42.

The CSA told the customers that they can not use the same contactless card for multiple customers entry and exits. The female Customer said we have just done this at Euston to enter the system. At this point Male customer went to exit using different gate no. 50 after couple of attempts the gate opened and allowed him to exit using same contactless card. We can not work out why and how this is possible. Please investigate thoroughly and explain how and why this is possible and publish on next T&R for others benefit.

Thanking you in advance.

[REDACTED]
[REDACTED]
[REDACTED]

Hi [REDACTED],

Thanks for your email and for highlighting this issue.

We have had a number of similar queries raised by staff at other stations and will be covering this issue in a bit more detail in the next T&R Update.

The basic rules for Contactless payments have not changed and like Oyster, only one customer can use a particular card to make a journey.

In instances where a customer touches in and then several minutes later touches in again, as there is no history currently held on the card and gates only hold detailed card information for a short period, it is possible the gate will open a second time. In the overall journey history for the day, each validation will be shown and two consecutive entries or exits will result in the customer being charged for one or more incomplete journeys. The only events that are disregarded by the back office are where a card is rejected as a result of the Pass Back restriction (Reject code 42)

We have raised the issue with the TfL team who process the contactless payments to get a better idea of how widespread this issue currently is.

Regards

Olly Oyster

From: [REDACTED]
Sent: 18 January 2016 21:37
To: Ask Olly
Subject: Register your Oyster

Hello Olly,

We are still getting the forms delivered to our station even though this process is now done online.

Who do we contact in regards to this as Magnadata never pick up the telephone?

Thanks

[REDACTED]
[REDACTED]
[REDACTED]

Hi [REDACTED],

Thank you for your email.

Oyster Registration forms are still supplied to stations, as customers can still use this as an alternative method of registering their card.

If your station has a large stock of these, further deliveries can be stopped by completing a consumable order form on the iPad.

This replaced the previous stock reconciliation form. At present you cannot enter zero as the order quantity, but if you enter "1" you can insert an explanatory note to ask for further deliveries to be discontinued. Cubic should then discontinue the automatic delivery of further stock, which is based on a percentage of Oyster card issues at the station.

Regards

Olly Oyster

Hi [REDACTED]

Thanks for your further email about the LU magnetic tickets.

This is a problem that has been going on for a while now and affects a small number of through tickets we issue to NR destinations where the customer needs to go through our gates as part of an Out of Station Interchange (OSI).

If this occurs at a station where we do not sell Single tickets to a particular NR station (such as Vauxhall), then the gates currently reject the ticket, as they cannot calculate the correct fare. At Vauxhall this would affect a number of SWT destinations. We have previously identified similar issues at both Waterloo (LU) and Tottenham Hale.

This was due to be fixed at the January Fares Revision, but clearly hasn't been. The TfL fares team are currently following this up with Cubic and we are hopeful that it will now be resolved as part of the forthcoming May Fares Revision changes.

Hope you are settling in to your new role and location.

Best wishes

Olly Oyster

From: [REDACTED]
Sent: 23 March 2016 21:52
To: Ask Olly
Subject: Failing LU paper tickets

Dear Olly,

You're not the only one who has been busy. I've been meaning to write to you since the fares revision. Although since then the magnetically blank (code 07) NR tickets seem now to have disappeared, at Vauxhall we are still experiencing pink LU tickets failing with error code 13 (under value).

When we read the writing on such tickets they are for through journeys to NR destinations. Yesterday I had two from King's Cross, one to Epsom and another to New Malden. Today I had one from a different origin going to Chiswick. There must be something wrong with the magnetic coding.

Yours

[REDACTED]
[REDACTED]
[REDACTED]

SPECIAL FEATURE

A NEW KIND OF PLASTIC

Sterling banknotes have been issued by the Bank of England for over 300 years.

If you conducted a straw poll, you'd find that most people would identify the banknotes in their pocket to be made of wood-pulp paper. In fact to make them more durable they consist of a cotton fibre and linen rag mixture broken down into individual fibres and then reformed into high quality reels of paper. Although harder than paper, the trusty £5 note you carry today can best expect to last around one year.

In **September 2016** this will all change, starting with the introduction of a new £5 polymer (plastic) banknotes. This will be followed a year later with a £10 version and a new £20 in circulation by 2020.



The Bank of England and countless businesses up and down the country will spend the period of time between June and the launch date in September educating, promoting and preparing all cash machines, vending machines, self-service checkouts, desktop note counters and any other machine that weighs sorts, accepts, dispenses or recycles banknotes, to ensure that they are all ready for its introduction.

There is also the need to provide training and support for thousands of staff who regularly handle cash.

As you can imagine, London Underground is affected in all of these areas.



Our education starts here and between now and the launch of the new note the T&R Team aim to provide you with details of what London Underground and its partners are doing over the next few months to ensure we are ready.

Why Polymer?

Polymer banknotes are manufactured from a transparent plastic film, specially coated with an ink layer that enables it to carry the printed design features of banknotes.

£5

The material allows the inclusion of 'windows' or clear portions in the design which enhance protection against counterfeits.

They are also;

Clean

Resistant to dirt and moisture so stay cleaner than paper banknotes

Secure

Incorporate advanced security features making them difficult to counterfeit

Durable

Last at least 2.5 times longer than paper banknotes improving the quality of notes in circulation

The £5 polymer note will be around 15% smaller than the current paper version, but will keep with a traditional look, with a portrait of Her Majesty the Queen on the front and a significant historical figure on the reverse.

For the new £5 banknote this will be **Sir Winston Churchill**, with the houses of Parliament in the background, although the full designs will not be released until **Thursday 02 June**, along with a list of the new security features.

ESTIMATED TIMELINE

2016	June- Design launch and awareness campaign September – New polymer £5 note issued By year end – Bank of Scotland, Clydesdale and Royal Bank of Scotland launch their designs
2017	New £1 coin issued by the Royal Mint. Design launch of £10 polymer launch April – Complete withdrawal of old £5 notes, 200 days after it was launched. Late year launch of new £10 polymer note
By 2020	Withdrawal of old £10 Launch of new £20 polymer note

Even with the introduction of a multitude of contactless payment methods, widely available debit and credit cards, and online payment methods such as PayPal... cash remains the most popular method with which to pay. So you may be interested to know;

- 52% of all purchases are made using cash, of which 60% are 'spontaneous' buys (such as that fine cup of extra frothy, double-shot Macchiato with a vanilla dash you're drinking or that lottery ticket you've just pinned your hopes and dreams on).
- 29 million daily transactions are under £5, that's 58% of the total number of daily transactions.
- The dependable £5 is the most commonly used banknote, with around 320 million of them in circulation (that's £1.6 billion in value).
- £5 banknotes make up 60% of all banknotes used in the transport sector (nationwide).

Source – Bank of England, Cash Services

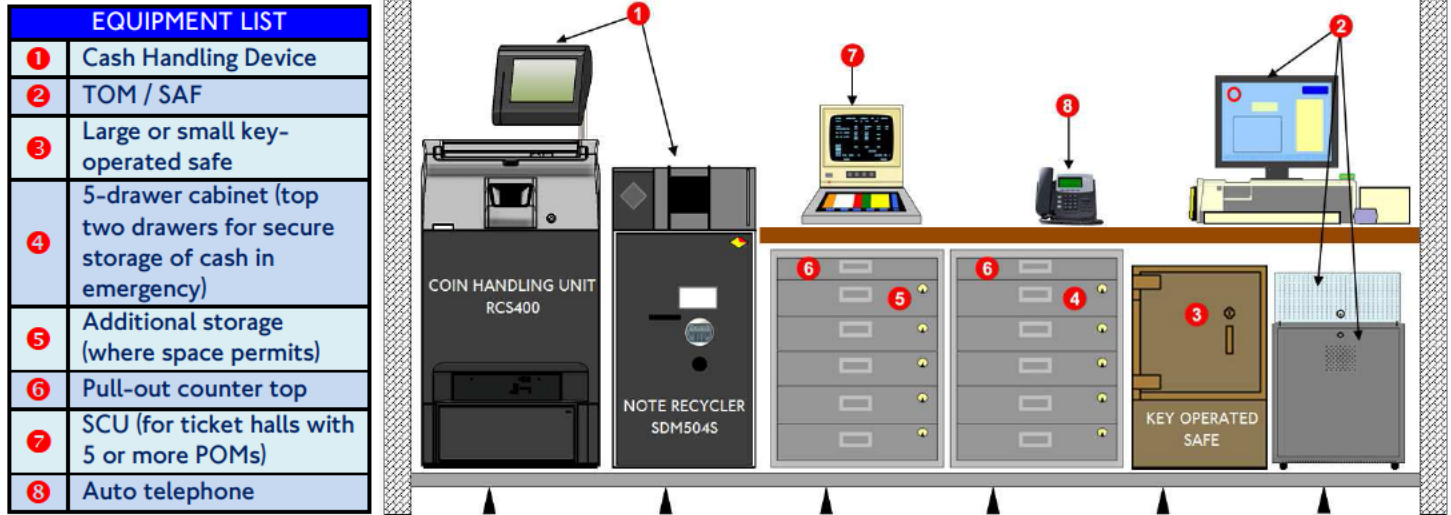
DID YOU KNOW?

SPRING CLEAN 2016 (PART 1) – POM ROOMS

It is time for our seasonal ticketing and revenue spring clean, to ensure all T&R signage and equipment provides a consistent and clear message across the network to both customers and staff that use them. This month we look inside our POM rooms...

Following the secure suite changes of the past year or so which have seen the removal of large amounts of equipment, ticket stock and furniture, there appears to be a certain amount of confusion on stations over what should and shouldn't be within our POM rooms and secure lobbies.

In this edition our 'Spring Clean' article focusses on POM room equipment; what should be there, what they are used for and why.



The items that are illustrated and listed above are all that are required to effectively carry out POM room operations on a day to day basis. Now that the range of ticketing stock has been reduced, there is a reduced need for large amounts of storage, as only a small space is now required for items such as POM ticket rolls, Oyster cards, receipt rolls, wallets and bags and apart from the ticket rolls and Oyster cards many items can be stored outside the secure suite if necessary. There is also a responsibility for stations to manage consumables to ensure items are not over-ordered.

Furniture and equipment that have absolutely no place in a secure suite must also be removed / relocated. These include items such as filing cabinets / station files, staff lockers, chairs and tables to list but a few. However, more extreme examples have been identified in recent months which include armchairs, fridges, sun-loungers, bicycles and even televisions, VCRs, DVD players and a games console.



A double multi-whammy of non-compliant items

There are four important LU documents that specifically refer to secure suites. Two of these are the LU Category 1 Standards;

- **S1371 – Station Planning** (which for the Fit for the Future Stations project now includes a Working Notice to reflect a number of changes in the new operating model)
- **S1375 – Planning for Ticket Issuing Facilities**

LU Standards govern the design, layout and technical aspects for the secure suite and provide information for anyone wishing to either build a secure suite from scratch or make major modifications which affect the layout and structure.

The two other main documents that must be adhered to are our very own T&R Books;

- **Book 1 – Security**
- **Book 7 – Ticketing & Revenue Supervision**

These T&R Books define who is allowed access to secure suites and what they can do while they are in there.

A major part of this is **key control**; as the security and integrity of the secure suite must be maintained at all times if we are to comply with our insurance, data protection, security and operational agreements.

DID YOU KNOW?

HEATHROW GATES REVERTED TO STANDARD LCPs

The gatelines at **Heathrow T123** and **Heathrow T4** are made up entirely of WAGs, to cope with the very high proportion of customers with luggage. The WAGs at both stations were upgraded to the new LCP3 just over a year ago in **May 2015**, in the early stages of the rollout to all sites with large numbers of E2 type gates.



HEATHROW TERMINALS 123

As reported in various previous editions of TRU, despite a number of software upgrades to address issues identified on gates with the new LCP, there remain a couple of outstanding issues which are still yet to be fixed. On E2 gates the predominant issue being the device occasionally stopping the transmission of transaction data. Initially this resulted in the gate continuing to work as normal, but eventually going out of service when the LCP could no longer store any further transactions.

Since this issue was first identified, gates have been remotely monitored by the Cubic Technical Support team, who now intervene as soon as they detect a gate as having ceased transmitting its data. The situation can be quickly remedied with minimal customer impact by remotely restarting the device, but one impact of this is that it causes the transaction counters on the device to be reset to zero. Gates report a summary of magnetic ticket and Oyster card usage in 15 minute periods and as a result when counters are reset, odd figures are reported for the 15 minute time band concerned.



As an example, if Gate 42 reported a cumulative total of 35,900 magnetic ticket users at the end of the 09.45 – 10.00 time band and was then reset and reported a cumulative total of 650 magnetic ticket users at the end of the 10.00– 10.15 period, the Central System assumes the counter had actually reached 99,999 and then gone to zero. The gate usage figures for the 15 minute period are therefore reported as 64,750, which is clearly not possible through one walkway.

These distorted statistics do not cause a particular problem at most sites, but at our Heathrow stations, commercial agreements between LU and the airport operator are based on customer usage. Currently this is calculated based on camera based counting technology, but LU is likely to benefit considerably from a planned switch to gate count based statistics.

The issues we have seen since the new LCPs were installed (as outlined above), have hampered this switch and as a result a decision was taken before Easter to revert the gates at both stations to standard gate LCPs. The Easter holiday and change to GMT meant there was only a limited window to undertake this work before a further freeze in the run up to the May Fares Revision.

Gates at **Heathrow T4** were downgraded on the night of **Sunday 10 April** and those at **Heathrow T123** over the following two nights.

All other E2 gates that have been equipped with the LCP3 will continue to operate with them and their current version of software, until an improved version that rectifies the transaction data lockup issue is available. As reported in TRU90, Gates at **Cannon Street** have been used to Vanguard a later release of E2 software, but this will not be rolled out more widely due to issues we have seen since it was installed there.

TEST BED FOR GATE SOFTWARE

In **TRU80** we outlined the extensive regime of testing that is undertaken by Cubic, before any new software or hardware is deployed. However, recent history has shown that despite large amounts of testing, it is often not until we move to an on system Vanguard, that we find issues that haven't been unearthed during testing. Exposure to real customers, their behaviours and much higher volumes of usage, which is difficult to simulate in a test environment, can often provide a much more robust test of how effective a new product is.

One of the big downsides of the normal testing cycle is the time it takes to fully test and deploy a fix for a particular problem. This has been a feature of the attempts to implement the LCP3 onto E1 and E2 gates, where we have had long gaps between different software releases. In an effort to shorten this cycle, TfL and Cubic have been exploring the possibility of using a small number of live gates at stations to effectively complete part of the testing process, without the need to complete the whole of the current cycle of off system testing. It is hoped that in doing so, we will be able to reduce the time it takes to be able to get a new version of software to a Vanguard site and at the same time allow more realistic testing by real customers.

At present we are looking at designating two gates at each of three stations as a sort of live test bed for each of the gate types.

The stations and gates selected are;

Station	P-Gates		E1 Gates		E2 Gates	
CANNON STREET					21	55
LONDON BRIDGE			45	59		
GREEN PARK	43	52				



In addition to being loaded with new software, these designated devices will also have the facility for Cubic to log onto the device remotely to extract log files and other information to help them monitor the gates and to trace the cause of issues when they do occur.

In a further change to be deployed via these engineering gates, Cubic have modified the time allowance within one of the files, to allow more time for the Ticket Handling Unit (THU) and RTD to report back to the LCP. It is felt that the high instance of Error 30 /130 and 99 on the Vanguard E1 gates was due to the THU or RTD not responding quickly enough. It is hoped that allowing more time for a response will reduce instances of these spurious errors being reported. This change was scheduled to be deployed to the 2 gates at **London Bridge** on **Tuesday 12 April**, following installation of the new LCPs into these gates the night before. Unfortunately one of the gates failed during the upgrade process and the work is currently being rearranged.

As with all trials and Vanguards, more detailed information on changes being deployed in this way, will be sent to stations concerned before it is deployed. Feedback from gateline staff on faults, error codes and unusual reject codes they become aware of, is particularly important to us, even if it may not appear to be totally relevant.

MORE SAFE CHANGES

At the end of last year, we completed a programme to remove keypad locks from float safes at all of our stations.



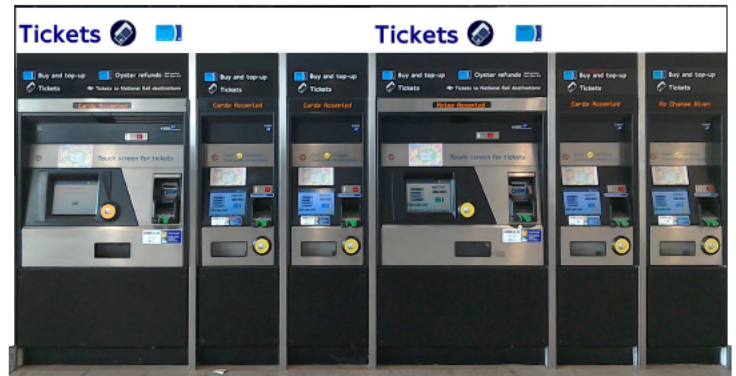
At the end of March we embarked upon a second programme of visits, this time to remove the keyless locks from Deposit safes at all stations where the new Cash Handling Devices are in operation. This work which is being undertaken by our contractor ILS, is being completed within traffic hours, largely on a group by group basis.

One of the main driving forces behind this further round of lock removals, is to avoid the need for managers to maintain access codes for staff on their area. It will also overcome the limitations of the maximum number of users that can be accommodated, now that the new group coverage arrangements have increased the numbers of staff potentially needing to access the safes on an area.



POM SOFTWARE UPGRADES

As reported in TRU89, in a change to the traditional pattern of only deploying software upgrades to devices as part of a wider project, it has been agreed between TfL and Cubic, that we will start to use separate 'Service Releases' outside of the normal project work. This will hopefully give a higher priority to fixing issues identified following a rollout and mean that we will not have to wait so long for a suitable opportunity to come along to implement a fix.



The first of these 'Service Releases' for POMs was scheduled to take place in February. However, the dramatic increase in the level of POM fraud, lead to all efforts being put into the development, testing and deployment of a new version of software for the AFM, which was successfully deployed to all devices in February.

The next software release covering both the AFM and MFM, is currently scheduled for deployment around **23 May** and will aim to fix a number of the outstanding POM defects recorded within the Cubic database. The current scope includes;

Consecutive MFM refunds	<i>on units fitted with BNRs the device can restart if consecutive refunds are processed. Customer's card is cancelled but they do not receive their refund and nothing is described on SAF.</i>
Refund of same card on adjacent MFMs	<i>a potential fraud where refund transactions can be initiated on 2 adjacent MFMs.</i>
Coin handling faults on AFM	<i>devices reporting error 151 until a reset is performed.</i>
AFM not accepting coins	<i>an issue where the reject mechanism in the CHU doesn't return to its correct position and causes all coins inserted by customers to fall straight to the bowl. Condition can currently be remedied by staff signing on and off.</i>
Acceptance of Scottish £1 notes	<i>currently the BNR units can accept Scottish £1 notes, but the MFM only recognises £1 as being a coin and causes the device to fail without showing the value if notes accepted. A decision has been taken to reject the small volume of £1 notes we receive, rather than changing the device software.</i>

This POM software service release is being timed to coincide with a planned change to the maximum bankcard transaction limit. Regular TRU readers will be aware that following the January Fares Revision, we increased the maximum limit for Chip & PIN bankcard purchases from £500 to £655. This new limit is the maximum possible, since this limit was found to have been hard coded into the POM software, when we started to explore a higher limit.

The software changes on **23 May** will remove this limit from the software and instead hold this in a configurable table elsewhere, which can be much more easily updated. The eventual plan is to raise the bankcard limit to £5,000, to allow LU customers to buy an annual Travelcard. However, initially the change will maintain a lower limit, with a further base data change later in the year, to raise the card limit to allow the purchase of annual tickets.



Once testing has been completed, we will be looking to have a Vanguard covering a number of devices, before the software is quickly rolled out to all POMs.

There are some other commonly raised POM issues which are being addressed via other initiatives:

- **Coin rubbing & POM scratching** – POMs at 14 further stations are scheduled to have vinyl coverings applied to improve the appearance of their devices.
- **MFM BNR capacity** - A change to the BNR software will restrict the number of notes that can be stored on each recycler roller, to avoid the recycler becoming over full and jamming. Units returned to the Cubic workshop are being updated and other devices will be upgraded as part of a programme of visits by technicians.
- **MFM rejection of foreign coins** - Following successful testing of a new validator unit for the MFM, we are looking to procure new validators for a number of devices. In the longer term the forthcoming PED upgrade (outlined on Page 16) will modify brackets within the AFM to be able to accommodate either the current or the new validator.

CHD ROLLOUT

We have recently seen the completion of a third wave of CHD installations, which saw devices deployed to stations on the old Heathrow, Acton Town, Liverpool Street & High Barnet groups during March.

Towards the end of this wave a number of Metro stations had CHDs installed, which have currently been "mothballed" to allow the appropriate staff to be briefed after the 03 April staff movements had taken place.

Dates for these devices to "go live" will be identified once sufficient staff have been briefed in advance and dependent on other stations where CHDs are now being installed going live. Following Easter there was a further 10 day break in the installation programme, before the fourth wave of installations resumed on **Sunday 10 April**. Installations are currently taking place at the north end of the Piccadilly line, south end of the Northern line and around the Circle line

A number of stations have continued to be hampered by data connectivity problems, which appear to be linked to the supplier of the SIM cards which the modem in the CHD uses to send and receive data. Whilst this will have been invisible to most users, we have had a small number of users, who having changed their CHD PIN, have then found that they have subsequently been either blocked from using the device or that their PIN has reverted to the original number. We are therefore recommending users to retain a note of their initial PIN, in case they have problems.



SCAN COIN		
Receipt:	656	
Machine:	BALHAM07 B1	
Date:	28/04/16	
Time:	11:20	
Customer:	Transport For London	
Location:	Balham,	
Operation:	MACHINE TOTAL	
Denomination	Number	Value
COIN DISPENSER - Dispensable		
GBP 0.10	831	83.10
GBP 0.50	140	70.00
GBP 1.00	180	180.00
Sub total:		GBP 333.10
Note Recycler - Dispensable		
GBP 5.00	47	235.00
GBP 10.00	87	870.00
Sub total:		GBP 1,105.00
Note Recycler - Not Dispensable		
GBP 20.00	49	980.00
Sub total:		GBP 980.00
Note Recycler - Collectable		
GBP 5.00	10	50.00
GBP 10.00	10	100.00
Sub total:		GBP 150.00
Total coins: GBP 333.10		
Total notes: GBP 2,235.00		
Total notes + coins: GBP 2,568.10		
Total bags: GBP 0.00		
Number of bags: 0		
User:	[REDACTED]	
Id:	[REDACTED]	
Barcode:	[REDACTED]	

It would appear that in combination with a device going on and off line, there are some synchronisation issues between individual devices and our central database of users. Unfortunately, when these issues have occurred, they have tended to just affect one or two members of staff at a particular location repeatedly, whilst their colleagues experienced no problems in using the CHD. Scancoin are currently investigating the cause of both aspects of this problem.

A lull in device installations has allowed Scancoin to revisit a number of previously installed devices, to bring them up to the same level of software and hardware as deployed on more recent devices. One significant change that has now been implemented on all CHDs affects the operation of the Note Recycler unit. Some users may have observed that the recycler previously designated for £20 notes has been redesignated as "Roll 00".

This is a result of a restriction being implemented to prevent dispensing of these notes and the recycler being reprogrammed to allow the device to continue to accept notes even after the collection sack is full. Previously once the sack was full the CHD didn't accept any further notes, even if the recyclers had been empty.

The change also means that the sack can now be filled to the £20k limit whereas previously this had to be set below this amount to avoid the risk of the sack being overfilled. The recent change gives us a little more flexibility, particularly if we have a missed collection after notes have been moved to fill a sack.

One of the downsides of the recent change is that it is no longer possible to transfer only some of the notes from the old £20 recycler roll. If this recycler is selected all options other than "transfer all" are now greyed out.

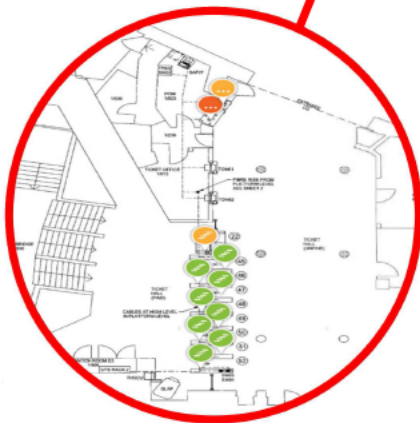
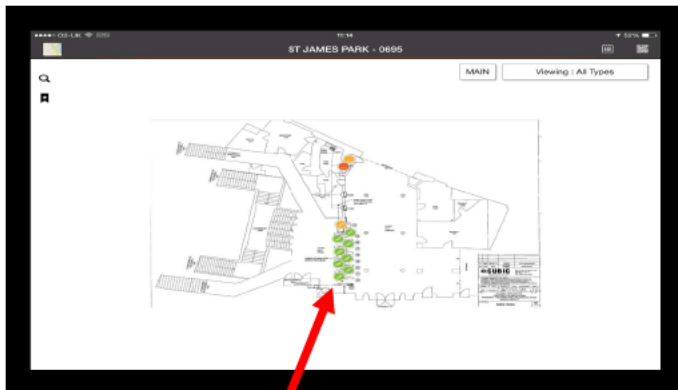
As a consequence if there are more notes on this recycler than can be accommodated within the collection sack, then the device will not allow any of the notes to be transferred. This could mean that it is not possible to completely fill the sack.

Since the change was implemented, we have changed the advice on transferring notes and are now recommending that the notes stored on "Roll 00" are moved to the collection sack on a regular basis, to ensure that there is always capacity available within the recycler to accommodate notes being deposited.

PROJECT UPDATES

DEVICE MONITORING APP

As reported in TRU88 work is currently underway to put the final touches to a new tool to help station staff monitor the ticketing devices on their station(s) and to report and track faults.



At the beginning of April data links between the Cubic system and the TfL IM network were switched on to allow information on events on devices at **Kings Cross** to be seen on a test iPad and for jobs to be logged with Cubic from the device.

Further testing has since taken place, connecting a total of 26 stations to compare the results seen on the device with events observed both on site and in data from other sources. This further round of testing will also allow us to monitor the time taken for information to be updated and to measure the volume of data flowing in each direction, to ensure the IM network can support the application when deployed system wide.

During the week commencing Monday 18 April testing of the application was undertaken by users at **Kings Cross, Loughton and Victoria**. Work is continuing to test the flow of data to and from gates at Kings Cross which are already equipped with the LCP3.

Some iPad users may have already seen this application indicated on their device, but until all testing has been completed, staff have been advised not to use the app. We are currently hopeful of being able to launch this to users across the network towards the end of May.

Initially although the status of all POMs at a site will be displayed on the iPad once signed-in, gates status will only be available at stations where gates have been fitted with LCP3. Currently this only applies to sites with predominantly E2 gates (except **Heathrow T123 & T4** see **Page 10**) plus **Stratford** and the new gates at **Tufnell Park** which are the current Vanguard sites for E1 gates.

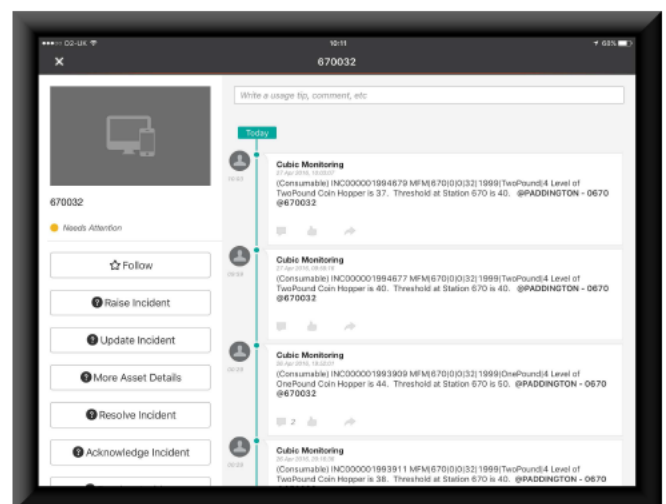
Features of the app are:

- *Indication of an event requiring attention via a “traffic light” indication on a ticket hall diagram*
- *Ability to get further information on an event or device via a more detailed time line*
- *A fault that will require a Cubic technician to resolve, will automatically logged as a fault with Cubic*
- *Other faults that can possibly be resolved by staff, or the need to restock or float a device will be flagged to users*
- *Other faults will be logged with the Cubic Helpdesk from the iPad and a Job number added to the timeline, without the need to ring 1610.*

THE KEY POINTS



- ▶ Will display status of all POMs, plus the status of gates which have been upgraded with LCP3.
- ▶ Automatic reporting of faults requiring a technician to Cubic.
- ▶ Ability to log faults with Cubic Helpdesk direct from iPad.
- ▶ Indication of need to refloat device or replenish stock.
- ▶ Automatic escalation if an alert is not attended to within a set time.

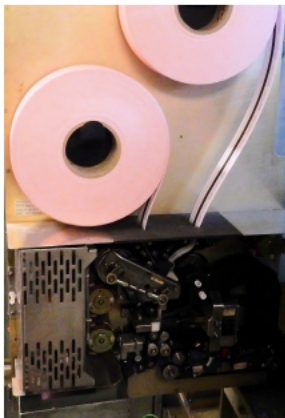


JLE MFM UPGRADE

In addition to the original batch of MFMs introduced in 1987, further batches totalling around 41 devices were produced, the first for the Jubilee Line Extension (JLE) stations between Westminster and Stratford and a batch originally ordered for the DLR, which was subsequently cancelled and the devices redeployed onto LU.

Although devices were initially concentrated on the JLE and at stations such as Kings Cross, where major works required additional MFMs, the subsequent uncontrolled movement of devices between stations has since seen these devices scattered round the network. This is not ideal from an operational or a maintenance perspective.

Although these "JLE" and "Buffer" devices have the same functionality as standard MFMs, their casings and some components are slightly different. Recent upgrades to the MFM have seen increasing standardisation of components, but one element of these devices that remains distinctly non-standard is the Ticket Handling Unit or THU, which issues magnetic tickets and receipts to customers.



The removal of a large number of complete TOMs together with the THUs from all of the remaining TOMs which have been relocated into POM rooms now means we have a large surplus of THUs in stock. TOM THUs are very similar to standard THUs in our POMs.

Cubic have identified that with slight modifications to the backbones, they would be able to utilise these spare TOM THUs in JLE and Buffer MFMs and we are currently looking at short programme to deploy the best of the surplus TOM THUs into these devices in place of the current non-standard THUs.

Once completed, it will mean that these 41 devices will no longer have different THUs and that spare parts will be the same as for other MFMs, instead of having to maintain two distinct sets of spares as we do now.

SECURE SUITE LOG BOOK

The Secure Suite Log Book (formerly Ticket Office Log Book or TOLB) is currently being updated to simplify it and reflect changes since the closure of the last of our ticket offices.

A revised version is shortly to be trialled at several locations and will incorporate records of key issues, collections, all staff and visitors to the secure suite and will also include additional pages which will act as an Emergency Safe Contents Register in the event of a SAF failure, instead of having a separate book.



Further information on the new format and trial will be provided in the next TRU and *Hot Issues Bulletin*.

ANSWERS TO T&R TRIVIA

Pt. 1

L A L M X I D E P U

(a)
RAVENS COURT PARK

(b)
REDBRIDGE

(c)
ROYAL OAK

(d)
RUISLIP GARDENS

(e)
RUSSELL SQUARE

How did you do?

Pt. 2

Q1

Heathrow Terminal 5 – which opened 27 March 2008

(You might have gone for **Wood Lane** – but that really wasn't a completely new station as 2 separate LU stations with this name had previously existed)

WHERE'S WOLLY?

ELEPHANT & CASTLE

...AND FINALLY!

CHIP & PIN UPGRADE TAKES A STEP NEARER

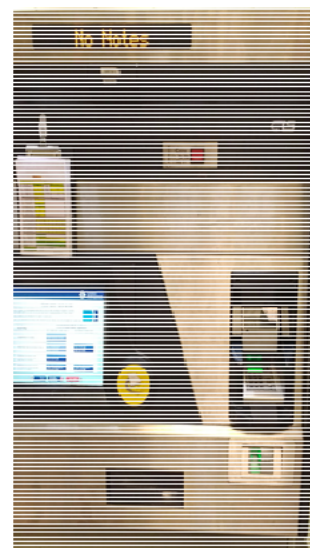
We will be replacing all of the Chip & PIN units (PIN Entry Device or PEDs) on all of our POMs later this year. Cubic have recently demonstrated the first prototypes of how the new PEDs will be fitted in to each of the 3 types of device. The main difference to the current units is that the keypad and card reading parts of the PED will be mounted separately.



The QBM modification will be completed in the Cubic workshop, so a buffer stock of 5 QBMs will be upgraded and then used to swap these with current devices. The whole QBM will be removed from the station and then upgraded within the workshop, to then be used to replace another device at a later date. The QBM change will require a change to the sign-on arrangements for staff, as the new PED will not be able to read a TSID card. It is planned to use the RTD to read the Staff Oyster card, in a similar way to how staff access the Staff facilities on the front of the POM.

AFMs will be modified on site, but will require the device to be pulled forward so that the front panel on which the RTD is mounted can be replaced with a similar panel also housing the card reader of the new PED.

The MFM will also be modified on site, but this will involve the cutting of a slot into the lower panel to accommodate the card reader (as shown on the right).



Once upgraded, POMs will no longer have the ability to accept magnetic swipe bankcards, so the small number of gateway and tourist stations that currently have this capability, will have it removed once their POMs are upgraded. This is likely to be phased towards the end of the PED rollout, by which time most US cards will have been migrated to Chip & PIN technology.

To minimise disruption, we are currently working with Cubic to co-ordinate a further change to allow the MFM to accept the new polymer £5 notes when they are introduced later this year.

We currently plan to complete the PED and polymer note changes in one visit.

A Vanguard of the new PED arrangement on the MFM is scheduled for **June 2016** and is proposed to include the 10 devices shown in the table on the right;

Station	MFM	
EMBANKMENT	30	
LAMBETH NORTH	30	
OXFORD CIRCUS	30	32
EUSTON	30	32
LIVERPOOL STREET (Main)	32	34
KINGS CROSS (Tubes)	32	34

NEXT ISSUE

Our next edition **TRU92** will be a combined May / June edition and is currently scheduled to be published towards the end of May. Dates may be adjusted if there are changes to the planned implementation dates for the forthcoming POM upgrades.

The next edition will feature;

- *Part II of our Spring Clean initiative looking at gatelines*
- *Second part of our countdown to the introduction of polymer notes*
- *Update on recent on-train fraud survey results*
- *Updates on current and forthcoming projects*

Plus all our usual features, T&R News and a further selection of your letters to Olly.



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