

Ticketing & Revenue Update

INSIDE THIS EDITION

IN THE NEWS

Pages 1-7 → [Fares Revision](#) → [T&R Consumables](#)
→ [Ticket Hall Transformations](#) → [Bicycles](#)

ASK OLLY!

Pages 8-9 → [More of your letters answered](#)

SPECIAL FEATURES

Pages 10, 11 & 13 → [Review of 2017](#) → [Journey Resolutions](#)

OYSTER EXPLAINED

Page 12 → [Bus Hopper Explained](#)

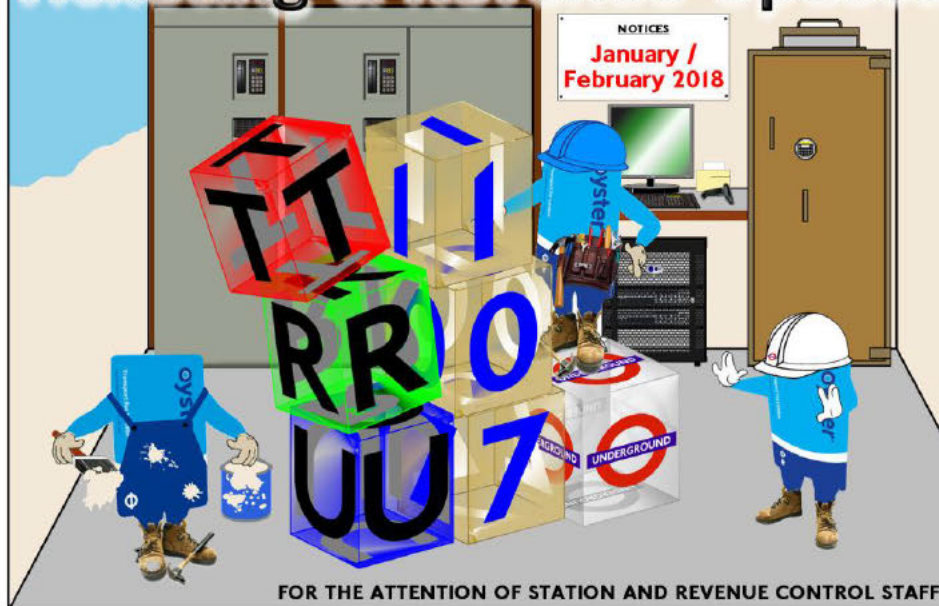
PROJECT UPDATES

Pages 14-19 → [TOM/SAF](#) → [TVM](#) → [POM issues](#)
→ [Coin counters](#) → [Gate upgrades](#)

AND FINALLY

Page 20 → [ITSO developments](#) → [Preview of TRU108](#)

TRIVIA – Pages 2, 4 & 6 [Answers on Page 19](#)



CONTACTLESS BECOMES THE MAJOR PLAYER FOR PAYG



Since the introduction of contactless payments in September 2014, the numbers of customers using contactless bankcards and other devices to make PAYG journeys on the LU network has grown steadily.

Major milestone - In December 2017, the percentage of customers using contactless payments to make PAYG journeys exceeded 50% for the first time.

Numbers of customers using contactless payments are set to continue to grow and there is plenty we can do to encourage customers to switch to using contactless payment from other methods of paying or when they are using the network for the first time.

Remember that:

- Contactless fares are the same as using Oyster for PAYG journeys
- Since charges are calculated at the end of the traffic day, there is less likelihood of being charged wrongly in the event of an incident or equipment failure
- Contactless users get the benefit of a weekly cap, so will never pay more than if they had bought a 7 Day Travelcard
- No need to obtain or pay a deposit for an Oyster card
- No need to worry about topping-up or the PAYG balance.

KEY STORIES INSIDE

Page 3

[VISITOR TICKETING TRIAL](#)

In a follow-up to our previous coverage, we confirm details of the stations that will be involved in this trial.

Page 4

[TSID CARD REISSUE](#)

We outline progress towards the introduction of a new series of TSID cards in the spring and how this will affect users.

Pages 10-11

[REVIEW OF 2017](#)

As normal in our first edition of the year, we take a look back at what was achieved and what wasn't quite achieved during 2017.

Page 14

[TOM / SAF VANGUARD](#)

As the vanguard of the new TOM/SAF hardware and software commences, we update you on the changes being introduced.

Page 19

[SCU UPGRADE](#)

We confirm details of the locations chosen for the vanguard of the new touchscreen SCU later this year.

Written and compiled by

JANUARY FARES REVISION



WHAT WENT WELL



The impact of the second year of the Mayor's "Fares freeze" reduced the extent of changes implemented as part of this year's January Fares Revision, although NR fares changes still meant that new fare tables were required for all devices.

Implementation again went very smoothly, with no major issues to report and only 5 devices not behaving as they should have done.

WHAT DIDN'T GO SO WELL



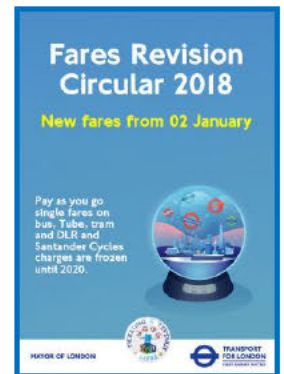
On the Tuesday morning, 4 devices were identified as having failed to load new tables and were subsequently out of service until Cubic engineers attended. Green Park AFM29, Paddington (Main) AFM16, Heathrow Terminals 123 MFM32 and Harrow on the Hill PVAL were all back in service by 14.30 hrs that day.

A further device, Gate 50 at Watford High Street was identified via the TfL Fares Exceptions report as still charging the old pre 02 Jan 2018 entry charges and this was also resolved by an engineer before lunchtime.

Another issue affected the Portable Ticket Issuing Devices (PTIDs) used on the Heritage Route 15 bus service and at Westminster Pier, which failed to upload January 2018 tables. Customer impact on the Heritage Route was that 2017 capping values were being charged, but there was no fares impact on the River services. New configured PTID Base Stations were taken to sites to resolve this issue.

Last but not least, a further issue was identified affecting POMs at Ashfield House Training Centre. The foreign language flags disappeared off the POM home screens after the fares revision and this has since been identified as being due to the new base data for the fares revision not being compatible with the old software still being used by these POMs.

This issue will be resolved once the Ashfield House POMs are updated with their new PEDs and brought up to date with the latest versions of POM software.



EXTENDED BUS HOPPER LAUNCHED

As previously reported in [TRUI05](#), in November, the Mayor Sadiq Khan announced plans to expand the existing Bus Hopper scheme to allow greater flexibility for customers to use multiple bus journeys.

From *Wednesday 31 January*, bus customers will be able to make multiple bus journeys within an hour.

Prior to the change customers were limited to their second bus journey within a period of one hour being free, but this did not apply if they had made a rail journey in between.

Further details of how this change to the Bus Hopper will benefit customers, is included as our featured topic for this month's *Oyster Explained* feature on Page 12.

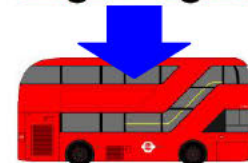


Part 1 – On the subject of bus fares...

Answers on [Page 19](#)

Q1) 5 years ago in 2013, how much would a customer have paid if they had started 3 PAYG bus journeys within an hour?

- | | | | |
|---|-------|---|-------|
| A | £4.20 | B | £4.35 |
| C | £4.40 | D | £4.50 |



Ticketing & Revenue
T&R
Trivia

T&R BOOK UPDATES

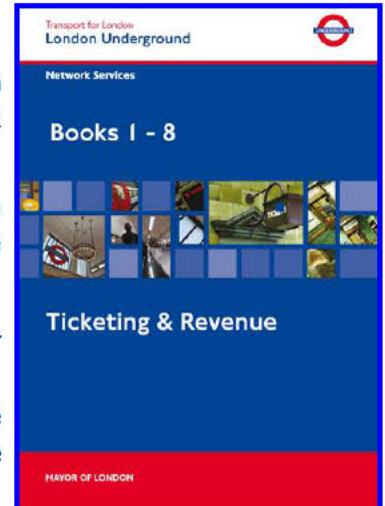
We had hoped that we would be able to use this edition of TRU, to provide a summary of the changes to be included within the forthcoming reprint of the T&R Books.

However, as is frequently the case with T&R related items, there has been a recent change to our plan which has led us to revise the planned publication date from 31 January until the end of March 2018.

This latest delay is in part due to a number of significant changes which will fall outside of the normal fares revision dates.

Rather than publish material which is quickly out of date, or requires the expense of a further reprint of certain books, we will try and incorporate all the forthcoming changes in one edition.

As a result the next update pack will include the reprinting of all of the current books, which will also hopefully avoid the problems we had last year, when several stations disposed of all of their books, including volumes that had not been reprinted in the last update pack.



VISITOR TICKETING - IT'S ONLY A TRIAL

In [TRU105](#), we outlined plans for a 6 month trial of a new Visitor ticket that TfL are looking to run from March this year.

As we stated in our previous article, this is very much being introduced on a trial basis to gauge demand and at the end of the trial period, there may be a decision not to implement this on a more permanent basis.

This particular trial is aimed at the short term visitors to London from outside the UK, who arrive without previously sorting out their ticketing requirements and for whom Oyster may not be an attractive option and buying a number of separate Off Peak Day Travelcards may be inconvenient and confusing.

THE KEY POINTS



The Visitor Ticket is only;

- ▶ a trial
- ▶ available at a restricted number of stations
- ▶ in 2 or 3 Day versions, valid on TfL services after 09.30 hrs but won't be valid on National Rail
- ▶ aimed at non-UK visitors that arrive without previously sorting out their ticketing requirements and will be priced higher than the comparable Day Travelcard

The fact that the new ticket will be restricted to TfL modes and will be priced higher than a Day Travelcard, should make it unattractive to those living or staying in London on a longer term basis.



Station		Customer volumes	Visitor volumes	% of visitors
EUSTON	*	Gateway Station		
HEATHROW T123	*	Gateway Station		
HEATHROW T4	*	Gateway Station		
KINGS CROSS	*	5,599,268	747,349	13%
VICTORIA	*	5,178,495	514,522	10%
LIVERPOOL STREET	*	4,197,602	206,239	5%
PADDINGTON	*	2,617,203	381,000	15%
SOUTH KENSINGTON	†	2,135,893	298,184	14%
WATERLOO	†	4,651,277	285,337	6%
LONDON BRIDGE	†	4,153,511	255,654	6%
EARLS COURT	†	1,402,323	248,725	18%
BAKER STREET	†	1,826,253	205,672	11%
GLOUCESTER ROAD	†	959,802	185,004	19%
QUEENSWAY	†	712,925	168,092	24%
BAYSWATER	†			
RUSSELL SQUARE	†	783,007	165,817	21%
MARBLE ARCH	†	954,603	140,773	15%
Key	Gateway Station	*	Tourist Station	†

Since our last report, TfL have finalised the list of 17 stations as shown in the table above, which will be included within this trial. The trial is currently scheduled to start on Sunday 18 March but prices of the tickets are yet to be finally confirmed.

IN THE NEWS...

TSID CARD REISSUE

Work is now well underway on the production of a new series of TSID cards.

These are due for delivery in late February and will then be distributed via Area Managers offices ahead of the new cards going live on Sunday 01 April.



THE KEY POINTS



- ▶ No new cards (other than replacements) will be issued after 18 February until the new series goes live
- ▶ New cards need to be kept safely until changeover date
- ▶ Don't dispose of old card until you've successfully signed on with new card
- ▶ Holders will have a new PIN for their new card and will need to change their CHD log on to match their new TSID PIN
- ▶ The new TSID PIN will also be used to access staff screens on front of POM after Sunday 01 April

To facilitate a smooth changeover to the new card series, any staff successfully completing their TMS assessment after 16 February, will not be issued with a TSID card until after the new series goes live.

It is important that any cards already sent out to Area Managers offices are distributed and activated as soon as possible, to ensure the holder is included in the card reissue arrangements.

We are currently working with Scancoin on the arrangements for the switch to the new card series, which will hopefully be achieved by loading a new user file containing the new TSID card numbers and existing CHD PINs.

For the first CHD sign-on after 01 April, each user will be prompted to change and confirm their new CHD PIN.

TSID SECURITY

We have previously reported on some on-going software problems which cause TSID cards that have been locally blacklisted to be repeatedly re-blacklisted by rogue devices on a station.

A contributory factor in this is staff blacklisting their cards in the first place, sometimes as a result of them repeatedly entering their PIN wrongly.

However, on some occasions this has happened as a result of cards being left in the POM Room and other members of staff accidentally using the card with their own PIN... obviously the incorrect PIN for that card.

So here are some simple rules to follow, to keep your TSID card and your account secure:

- ▶ *Treat your TSID card as you would treat your bankcard*
- ▶ ***NEVER** write your PIN on the actual card or in a place that it could be easily identified by others*
- ▶ *If you need to keep a note of your PIN, keep this secure*
- ▶ ***NEVER** disclose your PIN to **ANYONE** (not your manager or supervisor) either verbally or in an email*
- ▶ *Keep your TSID card with you to avoid the risk of losing the card*
- ▶ *If you should unfortunately lose the card, report this to your CSM so that it can be globally blacklisted.*



LAL MXIDE PU

Part 2 – We've mixed up the letters in these station names. Can you work them out?

Ticketing & Revenue
T&R
Trivia

(a) **BETTER RAKES**

(b) **BEARING KIDS**

(c) **HER LENT BEGAN**

(d) **BLOCKHEADS ROAR**

(e) **ENDORSE BUNG**

Is there a connection?
– You decide.
Answers on [Page 19](#).

SECURITY SEALS

In December 2016 the T&R Team were notified of a security issue with the plastic 'pull-tight' anti-tamper seals pictured in the furthest column of the table on the right.

These seals are used within the world of Ticketing and Revenue for securing;

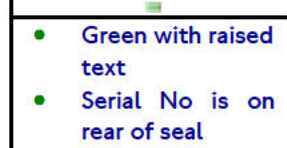


1. *Secure Suite keys within Station Office key boxes*
2. *Safe keys inside a nominated POM within the Secure Suite.*

This issue highlighted that it was possible, in certain situations, to unfasten the security seal without having to break it, which defeated the purpose of its use.

The issue was raised with LU Uniform Services (who supply the seals to stations) and an investigation was undertaken. Instructions were also published in the *Hot Issues Bulletin* that the seals were to no longer be used for securing safe keys within POMs, although they could still be used to secure the Secure Suite keys within Station Office boxes until further notice.

The good news is that a new type of security seal has been procured and approved for use. These are now green in colour (see image above) and can be ordered from LU Uniform Services in the same manner as previous supplies.

Until new seals are delivered, any stations requiring seals can temporarily use Multi-safe bags for safe keys and look to obtain seals from surrounding stations for use in key boxes.

Effective		Defective
		
<ul style="list-style-type: none"> • Green with raised text • Serial No is on rear of seal 	<ul style="list-style-type: none"> • White roundel • White text • "Enter" inscribed on rear of seal 	<ul style="list-style-type: none"> • Dark roundel • Dark text • "Enter" inscribed on face of seal
NEW DESIGN APPROVED FOR USE	CONTINUE TO USE UNTIL DEPLETED	DO NOT USE FOR SAFE KEYS

Final design may differ from example shown here



Stations that have an existing supply of effective (non-faulty) seals must continue to use them in accordance with the procedures outlined in [T&R Book 1 – Security](#).

BULK COIN BAGS

One of the most common queries received by the T&R team over the last few months has been around the supply of bulk coin bags.

The introduction of the new purple bags for £1 coins stimulated a lot of demand and although bags can be easily requested from the ticketing consumables order form on the iPad, many of the requests which the app directs to the appropriate Cover Group admin team to process and authorise, stalled at this point.

With proposed changes to the way admin support for station areas is provided, we have taken the opportunity of reviewing the current process to see if this can be improved in any way.

The proposed change for bulk coin bag ordering is that in future any requests submitted will be rerouted to the T&R team for processing.

Bulk coin bags are currently supplied to stations free of charge as part of TfL's banking contract, which is due to be retendered later this year.



Join our *email Distribution List* to ensure you get the benefits from;

- the most recent edition of the TRU, on the same day it goes to the printers.
- having your own personal copy.
- access to archived copies.

- Send an email to: david.nix@tube.tfl.gov.uk today.



VICTORIA EXPANDS

The latest phase in the transformation of Victoria underground station saw the opening of an expanded Victoria line ticket hall and additional entrances on Thursday 25 January.



The expanded ticket hall now includes an additional 11 new E2 gates and will eventually see the replacement of the existing pneumatic gates in the Victoria line ticket hall, with a further 12 new E2 gates, giving the station a new extended main gateline with a total of 23 E2 gates and 3 WAGs.

The final part of the major station improvements at Victoria station (which began in 2009) has seen the previous ticket hall double in size. This extended ticket hall also includes additional POMs with 5 extra AFMs situated in a new Remote POM Room.

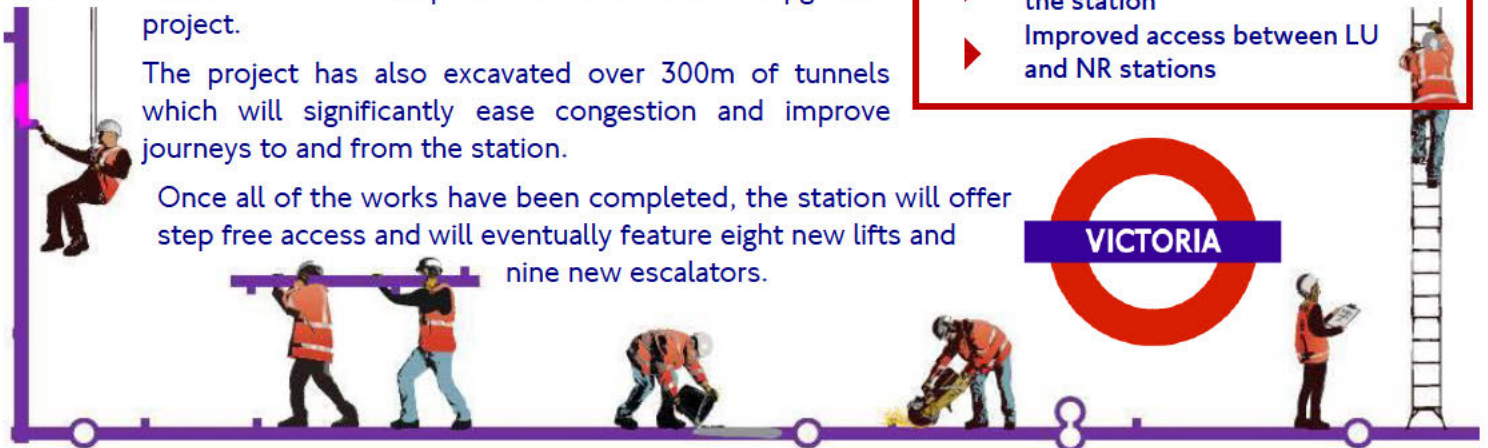
The two gatelines within the nearby District line ticket hall will retain their current pneumatic gates as the replacement of these was not included within the scope of the Victoria Station Upgrade project.

The project has also excavated over 300m of tunnels which will significantly ease congestion and improve journeys to and from the station.

Once all of the works have been completed, the station will offer step free access and will eventually feature eight new lifts and nine new escalators.

Customers will benefit from;

- ▶ A larger Victoria line ticket hall
- ▶ Nine new escalators and 8 new lifts
- ▶ A new interchange tunnel connecting the two ticket halls
- ▶ Step-free access throughout the station
- ▶ Improved access between LU and NR stations



TOTTENHAM HALE CLOSES

On the night of Tuesday 09 January 2018, POMs at Tottenham Hale were removed to facilitate major rebuilding work at the station. This work is currently scheduled to be completed in around six months.

In the week preceding this, two temporary QBMs were installed and commissioned, to provide a very restricted Oyster top-up facility whilst the work is taking place.

Fortunately the adjacent NR station which has a ticket office and NR TVMs will also offer facilities for customers to buy a wider range of tickets including Day Travelcards.



Part 3 – Linked to the changes to the [TfL Conditions of Carriage](#) outlined over the page, we thought we would test your knowledge on what can and can't be taken on the Underground.

Q2) Which of the following can be taken on deep level tube sections of the Network?

- | | |
|-----------------------|--|
| A Folding push chair | B Non-folding pram |
| C 1.75m plank of wood | D Non-folding bicycle with wheel removed |

Answers on Page 19

Ticketing & Revenue
T&R
Trivia

CASH IN TRANSIT RETENDERING

Completion of the process of retendering for the new Cash Collection contract has taken a little longer to complete than we had hoped. There were a number of aspects of the bids that required clarification as the initial responses had not met all of our criteria.

We were hopeful that the new contract would have been awarded before the end of January, ready to start at the end of February, but we are not quite there yet.

The new contract will see some changes to the current collection arrangements and scheduled collections:

- *Frequencies of collections from stations will be revised in line with actual cash collected over last year.*
- *The current recovery window for stations on weekly or fortnightly collection schedules will be replaced by an automatic next day revisit if nothing is collected (unless there is already a collection scheduled for the next day).*
- *In central London, collection windows will be widened from the current 2 hours to 4 hours, to try and offset impacts of traffic congestion and minimise numbers of missed or late collections. The current 2 hour windows will remain in place for stations outside of the central area.*



The new contract will also see a split between the cash collection and the cash processing and banking elements of the previous contract. This change is to facilitate the inclusion of cash processing within the retendering of TfL's banking arrangements later this year.

This process recently kicked off with a questionnaire being sent to prospective suppliers to gauge their interest and ability to deliver the elements required by TfL.

ON YOUR BIKE?

One issue that is a regular cause of disputes at the gateline, is the transportation of bikes on our trains.



One area in particular that has caused several disputes is around what constitutes a "folding bike".

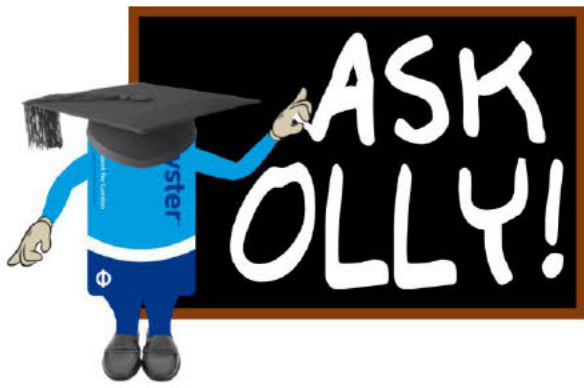


Some staff have interpreted this to be restricted to a Brompton or similar bike, but there have been cases of customers attempting to take full sized 26 inch wheeled bikes on the tube, on the basis that they folded.

Potential confusion around this has recently been resolved by a change to our *Conditions of Carriage* ([click here](#)), introduced on 31 January in conjunction with changes to Bus Hopper fares (see Page 2).

The revised conditions allow any folding bike regardless of wheel size to be carried, providing they don't get in the way of other customers. The rules around what can and can't be taken on which lines are summarised in the table below;

Fully folded bicycles or pushchairs can be taken on any London Underground line at any time of the day providing they are not placed on seats and do not obstruct other customers.		
Non-folding cycles and prams are not allowed on moving escalators and cannot be taken on LU on Mondays to Fridays (except public holidays) between 07.30 and 09.30 or between 16.00 and 19.00.		
Outside of the above times, Non-folding cycles and prams can be taken on the following sections of line;		
Circle	Hammersmith Metropolitan	District
The whole of each line		
Bakerloo	Queen's Park and Harrow & Wealdstone. Also Northbound Queens Park to Harrow and Wealdstone, between 07.30 and 09.30 Mon to Fri. Southbound Harrow and Wealdstone to Queens Park, between 16.00 and 19.00 Mondays to Fridays.	
Central	White City and West Ruislip or Ealing Broadway	Leyton and Epping or Newbury Park via Woodford
Jubilee	Finchley Road and Stanmore	Canning Town and Stratford
Northern	Edgware and Colindale	Hendon Central and Golders Green
	East Finchley and High Barnet or Mill Hill East	
Piccadilly	Barons Court and Hounslow West or Uxbridge	Cockfosters and Oakwood



askolly@tube.tfl.gov.uk

From: [REDACTED]
Sent: 18 January 2018 15:00
To: Ask Olly
Subject: Railcard discounts

Hi Olly

I've noticed a steady stream of adults and children buying Day Travelcards at child railcard discount prices, which means they are able to travel zones 1-6 for £2.40. Surely this is a glitch that should be looked at and a huge loss of revenue. Maybe an authorisation code could be used on the production of a valid railcard by a member of staff.

Kind regards

[REDACTED]
CSA
Vauxhall Area

Hi [REDACTED]

Thank you for your emails and for highlighting this issue. We have actually had similar feedback from station staff at a number of other locations and a review of sales seems to indicate a tremendous growth in sales of this type of ticket.

Unfortunately, this fraud opportunity arises due to the fact that the POMs are set up to allow genuine NR Railcard and Goldcard holders to purchase discounted tickets for children accompanying Railcard holders.

If there are significant problems with other customers purchasing these at certain times, the POMs have the capability to be set to inhibit the sale of all Child rate tickets from the SCU. The relevant procedures are included within **T&R Book 3 section 2.5**. Providing staff are available at the POMs to assist Railcard holders, the Child inhibit facility could be applied and temporarily removed to allow a genuine customer to buy the tickets they need and then reinstated afterwards, but this is something that would really need to be agreed locally with your CSM.

The SCU also has a facility to allow gate arrays to be set to monitor and reject all Child rate tickets. So even if the customer did buy a Discounted Child Travelcard from the POM, it would be rejected by the gate when they tried to use it.

Regards

Olly Oyster

From: [REDACTED]
Sent: 05 January 2018 13:15
To: Ask Olly
Subject: Child Travelcard with Annual Gold Railcard

Hi Olly,

Increasingly we see children and adults buying Child Travelcards at the Annual Gold/ Railcard rate of £2.40 from our POMs after 9.30am. Some are neither children or have Annual Gold Cards, is this a glitch on our machines?

One other question, what should we do when we see people buying these tickets who aren't children and also clearly don't have an Annual Gold Railcard at the POMs and using them at the Gateline?

Thanks

[REDACTED]
CSA
London Bridge Area

From: [REDACTED]
Sent: 03 January 2018 00:24
To: Ask Olly
Subject: CAPPING

Hi Olly,

If during the course of their journey a customer's PAYG goes into negative because of touching onto a bus validator and they then top-up to clear the negative balance (i.e. so the the PAYG total is equivalent to the daily cap); will this work ?

Many thanks.

[REDACTED]
CSA
Archway Area

Hi [REDACTED]
The PAYG balance on a card will not have any impact on the operation of Capping.

When a customer validates and their card goes into negative, the cost of the journey they have made has already been fed into the capping calculation.

The only thing that disrupts capping is if the customer fails to validate and ends up with an incomplete journey, as these do not get included in the capping calculation, even if they are resolved later on.

Regards

Olly Oyster

From: [REDACTED]
Sent: 05 January 2018 17:52
To: Ask Olly
Subject: Paper Annual Travelcard

Dear Olly,

I had a strange encounter today with a passenger holding an NR issued Annual Travelcard (Gold card).

She waved her card (in pristine condition) to be let through the barrier so I asked her if it had stopped working. She didn't seem to understand this simply replying that she didn't have an Oyster.

She told me that the station that issued the ticket told her never to put the card in the gate.

However when I looked at the ticket it was issued by "London Corporate", not a station.

Should I be concerned at this? Does someone need to pass a message back saying all tickets should be put through the barrier?

Best wishes

[REDACTED]
CSS
Putney Bridge

Dear [REDACTED]

The suspicion here is that some advice given to the customer may have been slightly misinterpreted.

We have some software built into our gates to overcome a previous fraud risk, due to the magnetic coding used on these tickets using a code rather than the actual dates.

In the past this meant that an old ticket could come back to life ("be rejuvenated") long after its actual expiry date.

One of the impacts of this anti-fraud measure is that if a ticket appears not to have been used for a long period of time and is then inserted into one of our gates, it will immediately be cancelled.

One of the side effects is that if a customer has an Annual Gold Card on a magnetic ticket and their "home" station doesn't have gates, they really need to use it through a National Rail gate, before using it on LU, particularly if a period of time has elapsed since the ticket was issued / commenced.

The suspicion is that if the customer has been issued a ticket primarily for a journey between NR stations that are not gated, they may have been advised not to use it through an LU gate, without first using it through a gate at an NR station?

Regards

Olly Oyster

Hi [REDACTED]

Thank you for your email and query.

When you say "receipt" I assume you are referring to the Oyster card journey history or detailed history printouts from the TOM.

The procedure covering this is in [T&R Book 5, Section 6.1](#).

This states that you can give a printout to a customer, but if the printout includes their name, it can only be given if they have proof of ID.

This is obviously dependent on you having immediate access to a TOM, which for an ad-hoc request may not be convenient if you have other customers to deal with in the ticket hall.

There may however, be circumstances where obtaining a printout may assist the customer in understanding why they have been charged a certain amount etc.

Hope this assists you.

Regards

Olly Oyster

From: [REDACTED]
Sent: 31 January 2018 19:16
To: Ask Olly
Subject: Transaction Receipts

Dearest Olly,

In the past few weeks I have had a number of customers asking about receipts of their transactions. I've advised them in the future they can print a receipt at the time of transaction via the orange "Print Receipt" button.

I believe that customers who have registered their Oyster cards online should be able to view their journey history and their previous transactions.

I was with a customer who registered his Oyster on his mobile and once completed we could not find any options to view previous transactions he had made but we could see his journey history.

As we are not allowed to print any Oyster contents via the TOM, what would you advise us to tell customers who weren't able to get a receipt (work expenses etc.) from the machine in the future?

Many Thanks

[REDACTED]
CSA
Angel Area

2017 IN REVIEW

In this special feature, as we traditionally do in our first edition of each year, we take a look back at some of the main Ticketing & Revenue events of the past 12 months.

We have reproduced below "Olly's Wish list for 2017" based on seven major items that we previewed back in [TRU97](#) in December 2016 and on the page opposite, we review each of these wishes, to see whether things went;

1. WELL 2. NOT-SO WELL ... or perhaps in some cases 3. NOT AT ALL

THESE WERE OLLY'S WISHES FOR 2017

1
Gate LCP3
Rollout

2
TOM Asset Refresh
and Software
Upgrade

3
SCU
Replacement

4
POM PED
Upgrade

5
Faster Universal
Load

6
More
WAGs

7
More Currency
Changes

continued...

2017 IN REVIEW

So how did things go?

Well a bit of a mixed bag really with three of the seven projects now scheduled to be completed within 2018, but the other four were successfully completed within the year.

1 Gate LCP3 Rollout	
<i>The year did see some progress with the completion of the LCP3 rollout to the large number of stations with E1 gates. However, there were issues with the batteries within the LCP3 and new software was required for each of the three gate types. The year ended with approval to rollout the LCP3 to the remaining stations with pneumatic gates, but as we report on Page 18, this won't now be completed until March</i>	
2 TOM Asset Refresh and Software Upgrade	
<i>Development and testing was completed within 2017, but priority was given to Visitor Information Centres which required the upgrade to be able to use the new style PEDs on their TOMs. Stanmore was the first LU site to receive the new hardware in early December and as we report on Page 14, the TOM/SAF Vanguard is now underway.</i>	
3 SCU Replacement	
<i>Again progress was a little slower than we had thought, but development of hardware and software has progressed and as we report on Page 19, preparations are being made for the start of a 6 station Vanguard in April.</i>	
4 POM PED Upgrade	
<i>Well at least we can report on the completion of this project, with over 1,000 POMs being successfully upgraded with the new Chip & PIN equipment (PED) before the 31 October deadline when the old system ceased to be supported.</i>	
5 Faster Universal Load	
<i>2017 saw the successful phased launch of both the Faster Universal Load (FUL) facility and the new TfL Ticketing app, allowing customers to buy season tickets or top-up their PAYG balance via the app and collect it from any reader 30 minutes later. The changes also now allow customers to collect their products when using bus services.</i>	
6 More WAGs	
<i>The fourth phase of the WAG installation programme was successfully completed with more stations having access improved by the installation of Wide Aisle Gates and some additional WAGs being added at locations which already had a WAG.</i>	
7 More Currency Changes	
<i>2017 was probably one of the busiest years ever for changes to the denominations of coins and notes our POMs and CHDs have to process. It kicked off with preparations for the acceptance of the new design of £1 coin launched on 28 March and was followed by changes to MFM's and CHDs to no longer accept the old paper £5 notes and to accept the new polymer £10 notes, which were introduced on 14 September. A further upgrade was required to devices in the run up to the old design of £1 coin ceasing to be legal tender on 14 October.</i>	

The year also saw us celebrate the [100th edition of TRU](#) in May and in the same edition we also celebrated the 30th anniversary of the [Underground Ticketing Project \(UTS\)](#), which changed the face of ticketing on LU in 1987.

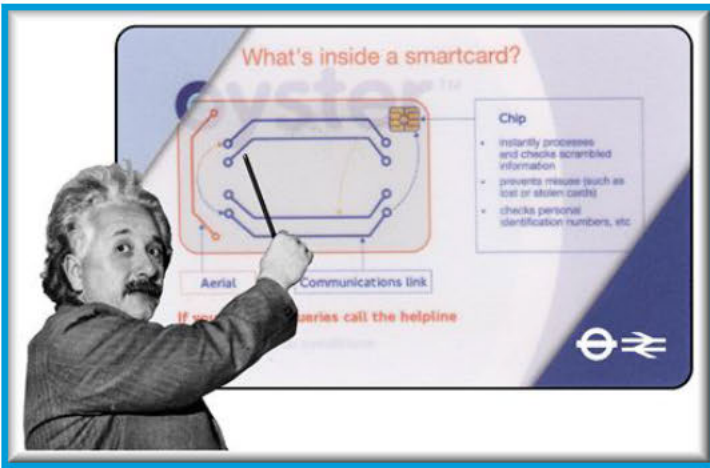
2017 also saw some other changes;

- Introduction of Digital Railcards and the expansion of the NR Railcard range with the introduction of a new 26-30 Railcard
- The continued modernisation of the LU network with a number of new or refurbished ticket halls at:

BOND STREET (Marylebone Lane)	CHARING CROSS (Strand)	LAMBETH NORTH
LANCASTER GATE	VICTORIA (North)	

So as we bid farewell to 2017, we hope that all of Olly's wishes for 2018 will come true in the not too distant future.

OYSTER EXPLAINED



The changes to the Bus Hopper charging arrangements introduced on 31 January (as outlined on Page 2) gives us a good opportunity to cover this topic as our first Oyster Explained feature of the year and to explain more fully how this will now work.



HOP↑HOP↑HOP

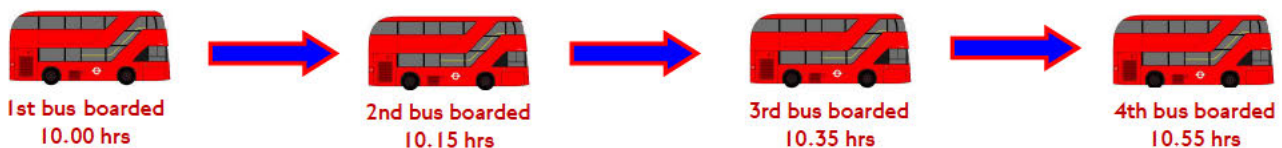


When originally introduced, the Bus Hopper employed functionality which previously supported Tram feeder bus routes in the Croydon area. This had allowed PAYG customers to make a combined bus and tram journey but only to be charged one fare covering both.

When the Bus Hopper was initially introduced the same functionality was used to allow a customer to make a second bus trip for free, if this was started within 60 minutes of their initial bus validation. This did not apply if the customer had made a rail journey between the two bus trips and resulted in customers being charged for two separate bus fares and for the rail journey in between.

Under the improved Bus Hopper arrangements, any bus journey started within an hour of the first bus validation will be free. It is therefore no longer restricted to the previous “pay for one, get the other free” offer.

EXAMPLE 1



So in our first example a customer taking two buses to reach an appointment and then making the return trip 20 minutes later, will now pay a single £1.50 PAYG fare.

The recent change to the Bus Hopper also includes for the first time journeys where the customer has taken a train or tube between their two bus journeys, as illustrated in two further examples below.

EXAMPLE 2



So in this second example the customer will now be charged for only one £1.50 bus PAYG fare plus the LU PAYG fare, saving them £1.50 and in example 3 below, a saving of £3.00.

EXAMPLE 3



This will have a major impact on PAYG users who have to take more than one bus as part of their journey. Some trips will now be made free and the user's card may no longer cap, if their total spend is now below the current daily cap.

JOURNEY RESOLUTION

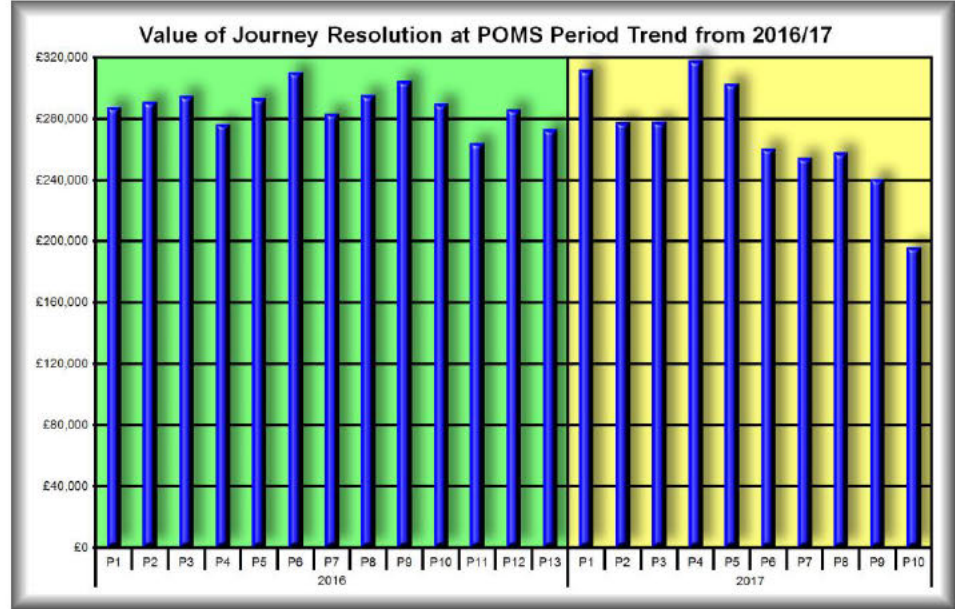
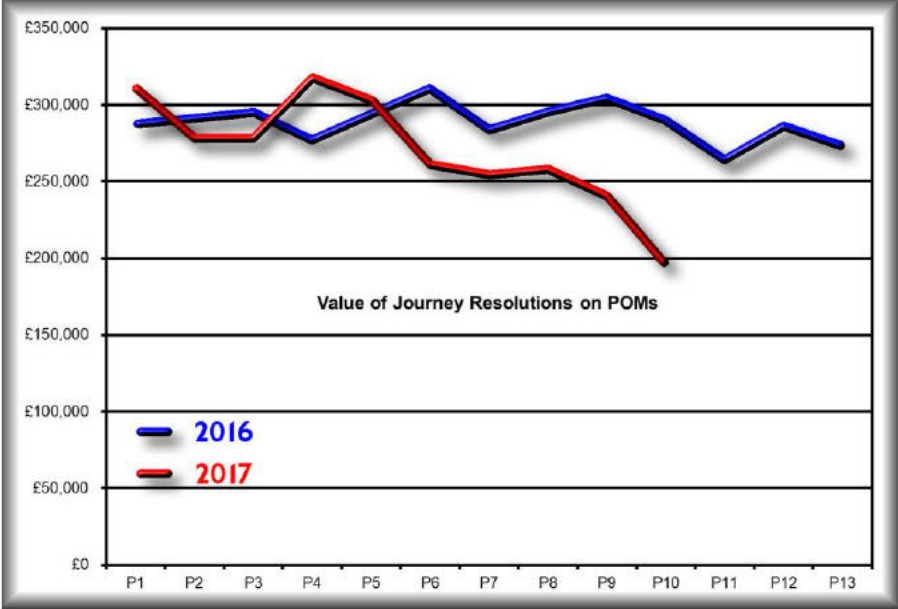
In our *Oyster Explained* Feature in [TRUI02](#) back in August 2017, we focused on incomplete journeys, with the latter part of the feature looking at high level of journeys that were being resolved by station staff, many of which fell outside of the criteria agreed with other operators.

As we said in that article, the level of journey resolutions being seen seem to indicate a common misconception that any incomplete journey should be resolved and the customers PAYG balance restored.

At that time there was also quite a high level of journeys being resolved where the whole PAYG charge had been refunded to the customer. So the customer had not been charged anything for their journey.

At a time when funding to LU from central government has been reduced and fares revenues are below expectations, every penny counts and attention has been focused on the high levels of cash being effectively refunded to customers through journey resolutions.

Since the summer more analysis has been completed to enable managers to focus on areas where the level of journeys being resolved is particularly high. The latest statistics covering up until the end of Period 10, show a very steep downward trend in the number of journeys being resolved on POMs, as illustrated in the trend line of the graph above.



Taking into account seasonal fluctuations, as Period 10 covers the Christmas and New Year period, the value of journey resolutions was still over £90,000 lower than Period 10 of the previous financial year, as illustrated in the bar chart on the left.

The reduction in the numbers of journeys being resolved over the last six months have seen the amount of money being handed back to customers fall by over £120,000 per period, from a record total of £318,000 in Period 4 this year to £196,000 in the latest period.

If this level was sustained it would represent a potential saving of around £1.5m over the course of a whole year.

So the message is continue the recent trend and avoid resolving journeys that do not meet the criteria set out in [T&R Book 2-Section 10](#) which states, "if the incomplete journey was due to;

1. any known incident which prevented the customer validating correctly			
Station evacuation	Service disruption	Failure of validation equipment	Major events
2. a recent customer error at your station			
Accidental validation when using another ticket for a journey		Validated but the decided not to travel	

REVENUE PROJECTS

TOM / SAF UPGRADE - VANGUARD STARTS

STRATFORD

In a slight change to the information we previously published in [TRUI05](#), the first of the new LU combined TOM/SAF units was installed in the Stratford (Mezzanine) POM Room on the night of Sunday 14 January.



As is typical of the first step of any rollout, there were some difficulties with both hardware and software elements requiring further visits, until the work was completed on the night of Tuesday 16 January.

This site had been brought forward into the TOM upgrade Vanguard, as the updated TOM is required to interface with the LU version of the TVM, which is now planned to be installed at Stratford in March (see article on Page 15).

The new equipment at Stratford is similar to that previously installed at Stanmore before Christmas, although the TOM and SAF there have been retained as separate units, as the TOMs are still used for ticket issuing on Wembley event days.

The Stanmore units also operate on the Visitor Information Centre (VIC) version of software which supports the magnetic ticket issuing equipment there, whereas the new equipment at Stratford (Mezzanine) will be the first to utilise the new LU version.

This contains a number of changes, the principle ones being the removal of a large number of screen options that we no longer require.

Some of the main changes are summarised below:

- KVM Switch replaced by Green and Yellow buttons on keyboard. (GREEN = TOM mode, YELLOW = SAF mode). The screen will indicate under the Cubic logo, whether the device is operating as a TOM or SAF.
- TOM no longer reports error codes for missing THU, Chip & PIN unit and customer display to SCU. Device should now appear without any error codes unless it actually has a fault.
- TOM Main Menu – Options 6 and 10 appear blank and are not available to LU users. Option 8 is now “Secure TOM”
- Sign-on to the TOM/SAF is now possible by either swiping the TSID card and entering the associated PIN, or by placing your Staff Oyster card onto the RTD and entering the TSID PIN
- Recent Refund and tenders menus have been updated to remove references to methods of payments that we no longer accept. Now only shows Cash, Debit/Credit card.
- Miscellaneous Transaction menu has been re-ordered and now appears in alphabetical order again. Please take care when using Transfer to/from cash handling Device, as these now appear adjacent to each other
- When undertaking a Transfer to the CHD the screen no longer displays an erroneous message about making a refund to the customer. The receipt produced also no longer has the word refund printed on it.
- On TOM Ticket Sales Menu, options relating to magnetic tickets now removed, leaving only F5 Refund available
- Magnetic ticket Refunds Menu, Non-ticket, 7 Day and Season ticket refund options have been removed
- Recent refund of ticket purchased by bankcard will now be processed as a cash refund
- Incorrect screen messages relating to the defunct OEP function no longer displayed when making a Oyster refund and adding PAYG to a card
- Options to create an Uncounted Cash bag have been removed
- SAF option to define Float Bag Contents removed
- SAF Main Menu – Option 7 is blank and unavailable to users. Can no longer view or print reports from Local SAF

Following completion of the Stratford upgrade, Cubic now plan to complete the TOM / SAF upgrades at the other agreed vanguard sites, on the dates shown below.

Date	Station
Sun 04 Feb	EMBANKMENT ◆
Mon 05 Feb	EUSTON ◆
Tue 06 Feb	HEATHROW T123 †
Mon 19 Feb	LIVERPOOL STREET (Main) †
Tue 20 Feb	LIVERPOOL STREET (Central) ◆

Date	Station
Wed 21 Feb	LIVERPOOL STREET (C&H) ◆
Sun 25 Feb	LEICESTER SQUARE †
Mon 26 Feb	BAKER STREET (Bakerloo) ◆
Tue 27 Feb	BAKER STREET (Met) ◆
Key	◆ = TOM/SAF † - TOM/SAF + Add TOM

LU TVM VANGUARD

As we outlined in [TRU106](#), it was planned to vanguard the first two LU variants of the Cubic TVM at Stratford (Mezzanine) towards the end of January/early February.

Although some preparatory work has already been completed, including the upgrading of the TOM/SAF, rationalisation of Cubic equipment and the delivery of a note recycler unit for the CHD, since the publication of our last edition before Christmas, the timescales for the TVMs have slipped back slightly.

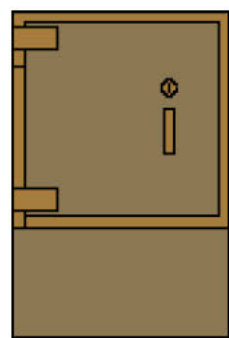


Installation work for the introduction of the first device has been pushed back one month due to the non-availability of the LU contractors who are required to complete the enabling works before the first TVM can be installed. Work is now scheduled to start on Sunday 11 March with the removal of an existing AFM, with the new device scheduled to be available for familiarisation of staff on the Stratford area around 3 days later.

At the moment a debate is going on around whether both of the current AFMs should be removed to accommodate the two new TVMs, or whether the installations should be staggered to mitigate the impact of any problems and maintain a limited ticket selling facility for customers throughout the transition period.

There has also been some recent discussion over the feasibility of installing one of the two devices earmarked for the Stratford vanguard at Tottenham Hale. As outlined in our news item on [Page 6](#), building work at the station has resulted in the temporary removal of POMs and their replacement by two temporary QBM. The use of a TVM operating in card only mode would at least offer the opportunity for customers to obtain a new Oyster card and buy magnetic tickets, neither of which are offered by the QBM.

If this proposal does go ahead, the 2nd device for Stratford (Mezzanine) would come from a further batch of new devices which are due to be shipped from the United States in April.



FINAL SAF BASE DATA UPDATE

Further to our article back in [TRU101](#), on Sunday 04 February the final batch of 14 stations had their base data updated to remove / correct out of date information regarding safes on the TOM/SAF screens.

As with the previous changes implemented in batches last year, safes that have been physically removed from the station have been deleted and where only one safe now remains, this has been renamed as 'Safe'.



MFM £10 NOTE UPGRADE

From Thursday 01 March 2018, the paper version of the £10 note will cease to be legal tender. In the weeks leading up to this date, Cubic will need to visit the 98 MFMs that are fitted with Bank Note Recycler (BNR) units to perform an upgrade to stop these machines from accepting and dispensing the old paper £10 notes.



Both of the £10 recyclers will then be available for polymer notes, effectively increasing the change giving capacity of the devices back to what it was originally.

The remaining MFMs with the older Bank Note Acceptor (BNA) units will be upgraded in a separate programme after 01 March. This will hopefully include an upgrade to the BNA unit firmware to improve the reliability of these units and reduce the numbers of notes jams we are currently seeing.

REVENUE PROJECTS

MFM SOFTWARE UPDATE

In the first major upgrade of the year, the MFM is scheduled to be updated with new software, largely to improve the current refund process. To counter previous fraudulent refund activity, we were forced to implement some emergency restrictions to prevent refunds on the older Mifare format Oyster cards and to prevent refunds on any card purchase within the previous 48 hours.

The second of these restrictions being particularly inconvenient for genuine customers who are making a short visit to London.

The software change being implemented, will introduce an online check of the Oyster cards history before a refund is processed and will allow the two restrictions above to be removed.

The new MFM software was initially due to be Vanguarded on 6 devices from Tuesday 23 January, but this work was postponed to allow clarification of some aspects of the upgrade.



The main changes are;

- Relaxation of restrictions on the refunding of Oyster cards purchased within the previous 48 hours
- Relaxation of restrictions on the refunding of the older Mifare format Oyster cards
- Correction of a number of incorrect error screen messages, including one which previously indicated that a customer's bankcard had been charged, when it hadn't
- A change to ensure local blacklisting information held by the device is correctly updated at End of Day
- Reduction in the delay between the issue of the first Oyster card and other Oyster cards, when a purchase of multiple cards is selected
- A change to reduce the occurrences of errors 97 and 113, which have occurred since the PED upgrade was completed
- A change to reduce some instances of error 204 (note jam) being reported on devices fitted with the BNA unit

A decision was then made to initially upgrade only one device at North Greenwich on Thursday 01 February, to allow on-system testing to be completed before the other vanguard devices were upgraded.

Some issues were identified during this initial testing at North Greenwich and a decision was therefore taken to upgrade MFM 30 at Canary Wharf (East) on the night of Monday 05 February. All being well the remaining vanguard devices will be upgraded on the night of Wednesday 07 February.

Station	MFM	Date
NORTH GREENWICH	30	Thu 01 Feb
CANARY WHARF	(East) 30	Mon 05 Feb
	(West) 31	Wed 07 Feb
	32	
NORTH GREENWICH	31	
EAST HAM	30	

After a 2 week Vanguard, if no issues are identified we will commence the deployment of the revised software to the remaining MFMs. This will be completed remotely by Cubic with the first 20 machines due to be upgraded on the night of Wednesday 14 February. The rollout rate will then be increased and continue at a rate of 50 devices per night over the next 9 nights.

SC3 REPLACEMENTS

In [TRUI05](#), we reported on the early upgrade of a small number of station computers to the newer SC3 model. These sites had been brought forward to overcome capacity issues at some busy sites, during periods of high transaction volumes.



This had led to the Station Computer (SC) locking up and loss of Station Control Unit (SCU) functions.

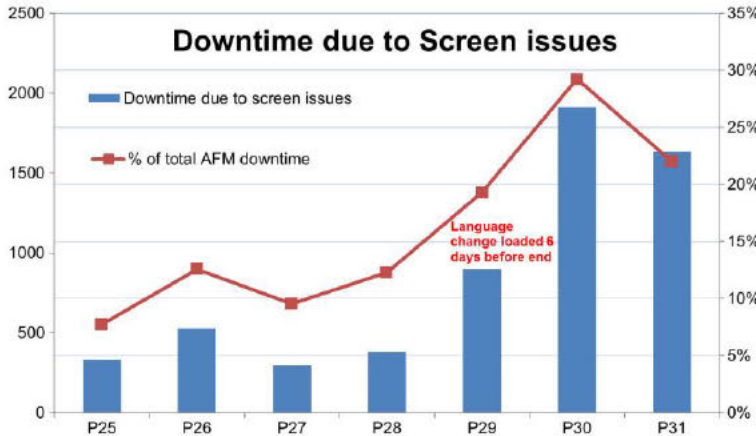
Following on from the successful conversion of these sites, Cubic have identified the 9 additional Station Computers in the table on the right to be upgraded at the end of January, ahead of the network wide deployment of the SC3 in the spring.

Station	Upgrade SC3
TOOTING BROADWAY	Complete †
EUSTON	Complete ◆
OXFORD CIRCUS	
CANARY WHARF (Mezz)	
WEMBLEY PARK	
WATERLOO	
LONDON BRIDGE	
HILLINGDON	Tue 23 Jan
HIGHBURY & ISLINGTON	Wed 24 Jan
LIVERPOOL STREET	(Central) Thu 25 Jan (Main)
STRATFORD	Fri 26 Jan
TOTTENHAM HALE	Sat 27 Jan
CANADA WATER	
MORRGATE (Northern)	Mon 29 Jan
FARRINGDON	Tue 30 Jan
Key	◆ - Vanguard † - Vanguard (since reverted)

AFM SCREEN FREEZE - A PROBLEM WITH PORTUGUESE!



In [TRU105](#), we reported on the long awaited implementation of POM screens in Portuguese, which was implemented as part of a base data load on Sunday 05 November 2017.



Unfortunately since this change was implemented in November, we have seen a significant downturn in AFM performance and an increase in the number of jobs logged with Cubic due to 'screen freezes'.

Although the additional language should have no impact on the device performance, the trend clearly started around the time the base data was upgraded, as shown in the graphs below.

Strangely, although changes were also made to the MFM at the same time, we have not seen the same screen performance issues on these devices.

As a result of the impact on the AFM, a decision was taken to temporarily rollback the AFM base data to the previous version without Portuguese.

This was implemented with effect from start of traffic on Sunday 14 January.

This means that for the period it takes Cubic to identify and resolve the AFM issue, Portuguese screens will only be available on the MFM and QBM and not on any of the 600 AFMs across the network.

AFM	MFM	QBM
Screens in Portuguese Language		
NO	YES	

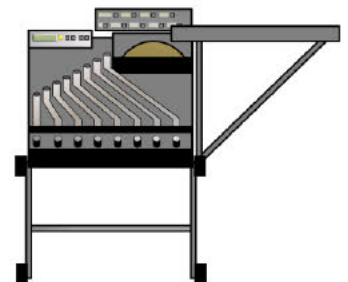
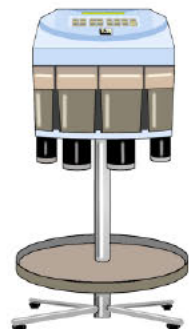
COIN COUNTERS – GOING, GOING, NOT QUITE GONE!

Since the completion of the Cash Handling Device (CHD) rollout, we have been alerted by various stations, to the fact that their old coin counters had not been collected. In nearly all cases these were supposed to have been collected either at the time the CHD was delivered or during a follow-up visit after staff training had been completed and the CHD was in use.

The recent round of station visits to prepare for the forthcoming TOM/SAF and SCU upgrades has given us the opportunity to check which coin counters are still present and what type they are. The results of these surveys have identified that we still have devices to collect, these comprising of a mixture of freestanding and desk top devices.

Following discussions with Scancoin and TfL's Tech & Data team, we have established that the purchase order covering the removal of redundant coin counters from stations is still open, so we are now planning the collection of the remaining devices.

A majority of the devices, particularly the very large Scan900 devices (as illustrated right), will be consigned to the scrap heap, but we have identified around 112 devices that can be upgraded to process the new design of £1 coin and these will be collected and assessed by Scancoin, to determine the best units for overhaul and upgrading.



We will then be deploying the best dozen units to the Regulated Stations on LU (RSLU) stations at the north end of the Bakerloo line and on the Richmond branch of the District line. These stations were not included within the scope of the CHD project and staff working there currently have to hand-count any cash removed from their ticket vending machines (TVMs). Details of collection dates will be communicated to stations in advance and aside from busy central London stations, we will be hoping to schedule most device collections during the day.

REVENUE PROJECTS

GATE LCP COMPLETION

We had hoped that by the time that this edition of TRU hit the streets, we would be able to report upon the completion of the long running LCP3 rollout.

Unfortunately, in a manner that typifies why this project has taken so long to complete, we have been hit with a further delay to the start of the pneumatic gate upgrades.

The delay is due to the need for Cubic's workshop to update each of the new LCPs with the latest pneumatic gate software and to replace the batteries within the units to overcome fears that these batteries will have deteriorated to an unacceptable level whilst in storage for an extended period.



HEATHROW TERMINALS 123

HEATHROW TERMINAL 4

One piece of good news at the start of the year was the confirmation that we could reinstate the LCPs within the WAGs at Heathrow T123 starting on Wednesday 31 January and Thursday 01 February and concluding at Heathrow T4 on Sunday 04 February.

Following on from this, Cubic plan to commence the rollout of the LCP3 to sites with pneumatic gates starting on the night of Sunday 11 February.

This short upgrade programme should see the 343 pneumatic gates and the remaining 84 E2gates / WAGs associated with these gatelines fitted with the LCP3.

The final devices at Waterloo (Main) are scheduled to be completed on the night of Thursday 08 March.

We are hoping to combine this final phase of LCP3 work with the reconfiguration of gate arrays at some of these stations, to place WAGs onto separate arrays to the other standard walkways.

This change will allow Revenue Control staff to set ticket checking on the gateline e.g. to block all Child tickets, but still allow any children using PAYG to validate their Oyster cards.

This change has been made at stations that were fitted with WAGs in later phases of installations, but stations that had WAGs installed in the first two phases had their WAGs configured as part of existing gate arrays.



WATERLOO

E2 GATE LID UPGRADE

Some very good news just before Christmas, was the confirmation of a decision by Cubic, to proceed with an upgrade of the lids on each of our E2 gates and WAGs, with a modified design previously trialled on gates at King's Cross (Western).

The origins of this project go back to 2011 and involved trials of a couple of different potential solutions.

Having finally concluded that the final version, as currently installed at King's Cross (Western) had been a success, there was then the small matter of how this should be funded.

The agreement reached before Christmas was to use money from the Product Assurance budget given to Cubic to manage, effectively bringing this work on E2 gates forward.

Hopefully the rollout of the new lid design will commence later this year.



KING'S CROSS



SCU UPGRADE - UPDATE



ORIGINAL SCU

Preparatory work towards the start of the planned 'touchscreen' Station Control Unit (SCU) Vanguard continues, with recent completion of the last station survey.

Every LU station has now been visited to check SCU and TOM positions and identify locations where SCUs or TOMs are either missing or in the wrong location.

To clarify, there should be a SCU:

- In every ticket hall, either on the paid or unpaid side of the gateline
- In every Station Control Room
- In Station Offices where the gateline can be monitored for parts of the day
- In POM Rooms with 5 or more POMs



2017 UPGRADE

The locations for the SCU Vanguard have also recently been confirmed, giving a cross section of different types of station and a mix of ticket hall and office SCUs. Similarly we have also found some locations which do not meet the criteria, where a SCU has been left and arrangements will be made for these to be removed and not replaced as part of the planned rollout.

Discussions are taking place with Cubic regarding the number of additional units required, but the project does provide us with an opportunity to add extra SCUs whilst the cabling for the new SCU rollout is taking place

The Vanguard which is now due to start in April will involve the locations shown in the table on the right:

Small Stations	
EAST PUTNEY	SOUTHFIELDS
Medium Stations	
EMBANKMENT	EUSTON SQUARE
Large Stations	
EUSTON	LONDON BRIDGE

Prior to us being able to install the new SCU, each of these sites will require the installation of new cabling and the upgrade of the Station Computer (SC) to the new SC3 unit, as outlined in our article on Page 16.

Although both Euston and London Bridge have already been upgraded to the SC3, their station computers will need to be swapped out prior to the installation of the new SCU, for units that have the most up to date software and settings loaded.

Cabling work in readiness for the SCU rollout has also recently commenced at a number of other sites.

In the coming weeks we will be undertaking further work on the user display and button descriptions to ensure the device which goes into Vanguard at the stations above, is as simple to use as possible.



2018 TOUCHSCREEN SCU

ANSWERS TO T&R TRIVIA

Pt.1 Q.1 A £4.20 (3x£1.40). The Bus & Tram cap was £4.40 at this time, so you would need to have made a 4th trip for the card to cap.

Pt.2 LAL MXIDE PU All stations that begin with the letter "B"



Pt.3 Q.2 A & C Any folding pushchair and any item under 2 metres in length

How did you do?

KEEPING AN EYE ON THE NEIGHBOURS

KEY GO LAUNCHED

From time to time, we use our *Keeping an Eye on the Neighbours* feature to update our readers on interesting developments in ticketing being introduced by other operators.

Great Northern

Gatwick
EX

SOUTHERN

Thameslink

From Wednesday 31 January 2018, Govia Thameslink Railway (GTR) who currently operate London area services on the Southern, Gatwick Express, Thameslink and Great Northern routes, launched a new method of payment on their services.

The new keyGo facility is a new Pay As You Go option for customers holding one of GTR's 'the Key' branded ITSO cards and register to use this new method of payment.



Unlike Oyster PAYG where the customer has to load value onto their card before they can travel, customers register online and link their 'the Key' card to their bankcard.

They then touch-in and out and the costs of each journey made are aggregated across the day in a similar way to how customers using contactless payment are charged. With keyGo the amount the customer is charged for their day's travel will then be calculated based on the best value option including NR Peak, Off Peak, Day Singles, Day Returns, Travelcards and operator specific tickets (such as "Thameslink only" tickets).

Within the London zonal area journeys will be matched to the appropriate Daily cap or Day Travelcard price.

Standard class fares will be charged and unlike Oyster, no discounts will be given to NR Railcard holders, but holders of Child Key smartcards will be charged fares at child rate.

Like Oyster and contactless payment, it is important that users touch-in and out on each journey they make. If they miss a validation, the keyGo system will try and "autofill" the gap and the customer will also be able to enter missing validations via their account on a limited number of occasions. If the limit is exceeded or journeys are not amended an incomplete journey charge of £25 will apply.

KeyGo is not valid on any TfL services, even where inter-availability between LU and NR exists for other ticket types. However, GTR customers will be able to use their Key cards to enter and exit at stations served directly by GTR services. Any keyGo users travelling on our services should be treated as travelling without a valid ticket.

LOOKING AHEAD TO TRU108

... which is scheduled to be published towards the end of March.

We hope to include the following items within our next edition:

- Results of the November on Train Fraud Survey
- Summary of changes included within delayed T&R Book reprint
- A further Oyster Explained feature
- Updates on all of the current T&R projects

Plus a further batch of items from Olly's inbox (please keep these coming) and a selection of our other regular features.

