

UK Fares and NeTEx Profile Workshop. Part3 Complex

London 16th July 2019. Sheffield 18th July 2019



13:15 – 14:00	NeTEx Intro & Basic fares profile
14:00 – 14:30	NeTEx routes and timetables – detailed -
14:30	Break
14:40 - 15:30	Complex fares requirement & Fare modelling
15:40 – 16:00	Questions and Next Steps

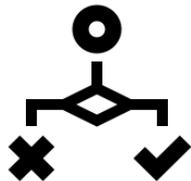
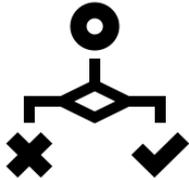


Department
for Transport

Part II

NeTEx Bus Fare Advanced features





Some types of Complexity found of fares

▶ Products supported by multiple operators

- Tariff structures covering large networks
 - ❑ E.g. *Plusbus*

▶ Compound products / offers:

- Multiple products in one package
 - ❑ E.g. Oyster , Plusbus
- Products that are available both as separate offers and as single purchase
 - ❑ E.g. Plusbus
- Local variation in rules & participation?

▶ More complex Products & Tariff structures

- E.g. Capped Pay as You Go (Oyster)

▶ Complex rules for a fare product, notably

- Day types / Timebands / Fare demand typs
 - ❑ E.g. *Metro & rail peak/offpeak into London*
 - ❑ Plusbus exceptions Night buses after 11.30
- Exclusions / inclusions of services
 - ❑ E.g. all Metrobus in Crawley region except and line 4
- Eligibility conditions

▶ Combining rules specified at different levels

- E.g. Temporal Validity conditions on tariff, product, sales offer

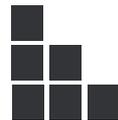




Aspect		Basic Fare profile	Advanced Fare profile
Tariff Structure Spatial		<ul style="list-style-type: none"> Point-to-Point, Zone-to-Zone Zonal Stage fare / unit section Flat 	Composite tariffs
Tariff - Temporal		<ul style="list-style-type: none"> Time intervals 	+ Peak/ off-peak etc conditions
Products		<ul style="list-style-type: none"> Trip, Pass, Carnet 	+Sale Discounts, Capping
Product options		<ul style="list-style-type: none"> User Types, Group Tickets Simple travel constraints 	+Complex travel constraints +Complex commercial conditions
Sales Offers		<ul style="list-style-type: none"> Media, Distribution Channel 	
Scaling		<ul style="list-style-type: none"> Line, Network, Operator(s) 	+Complex Multi-operator, National, modular
Prices		<ul style="list-style-type: none"> Absolute prices 	+ Derived prices



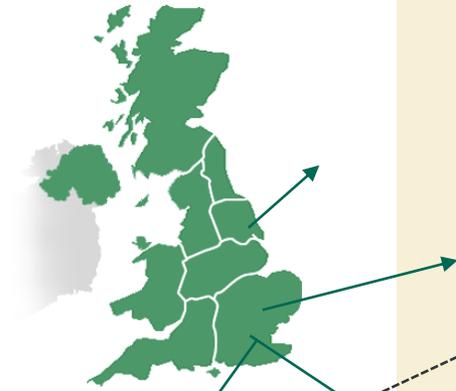
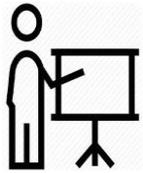
Modelling Multi-Operator Fares





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Interoperating fares – eg Plus Bus : Zonal add on for rail tickets



Zones around country

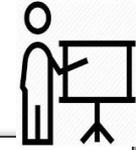
- Multiple participating Bus operators
- Exceptions in each zone
- Sold via rail sales channels



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Plus Bus tariff - Crawley

DISCOUNT RIGHT



SALES PACKAGES

USER PROFILES

FARE ZONE

FARE PRODUCTS

TARIFFS

PlusBus Adds urban bus travel to your train ticket.

search by postcode: GO > search by town: GO >

Crawley, Gatwick Airport, Horley, & Three Bridges PlusBus

A **Crawley, Gatwick, Horley** or **Three Bridges PlusBus** ticket gives you **unlimited bus travel** on participating operators' services, around the whole urban area of **Crawley, Gatwick, Horley, and Three Bridges**, as shown by the travel maps (below).

Interchange stations ⇄
Crawley (Station Way), **Gatwick Airport**, **Horley** (Victoria Rd), **Three Bridges** (Haslett Ave).

Day prices:
 Adult: £3.70
 Child: £1.85
 Railcard holder: £2.45

Season prices:

	Adult	Price / Day
7-days	£16.00	£3.20
Month	£52.00	£2.60
Quarter	£125.00	£2.08
Annual	£440.00	£1.83

Child discounts: half adult season ticket prices.

TIME INTERVALS



FARE PRICES

USER PROFILES



Railcard discount restrictions for PLUSBUS

Railcard holders get 1/3 off the adult price of PLUSBUS day tickets. Some Railcards have retail restrictions, see individual Railcard conditions. Sorry, Railcards do NOT give a discount off any season ticket price.

NETWORK Railcard (Annual Gold Card) holders get 1/3 off the adult price of PLUSBUS day tickets for towns and cities located in the South East of England, upon presentation of their valid Network Railcard (Annual Gold Card), as follows:-
 Mondays to Fridays **after 10:00hours**;
 Saturday, Sunday, Bank Holidays any time.
 The £13 minimum fare restriction does not apply to PLUSBUS day ticket purchases.

Two Together Railcard holders get 1/3 off the adult price of PLUSBUS day tickets, upon presentation of their valid Two Together Railcard, as follows:-
 Mondays to Fridays **after 09:30hours**;
 Saturday, Sunday, Bank Holidays any time.
 You must buy 2 tickets at the same time.

16-25 Railcard, 26-30 Railcard & HM Forces Railcard holders get 1/3 off the adult price of PLUSBUS day tickets, upon presentation of their valid 16-25 or 26-30 Railcard or HM Forces Railcard, **at all times**.
 The £12 minimum fare restriction does not apply to PLUSBUS day ticket purchases.

Senior Railcard holders get 1/3 off the adult price of PLUSBUS day tickets, upon presentation of their valid Senior Railcard, as follows:-
 outside of the South East of England at all times;
 in the South East after the Monday to Friday morning peak period* (excluding Bank Holidays) for a journey wholly within the South East region.
 * times of off-peak services vary by route, but generally related to the availability of Off-Peak tickets.

Disabled Persons Railcard holders get 1/3 off the adult price of PLUSBUS day tickets, upon presentation of their valid Disabled Persons Railcard at all times, when purchased with the following rail ticket types:-
 Off-Peak Day Singles, Off-Peak Day Returns;
 Anytime Singles, Anytime Returns;
 Advance fares.
 Disabled Persons discounts are valid during the morning peak hours.

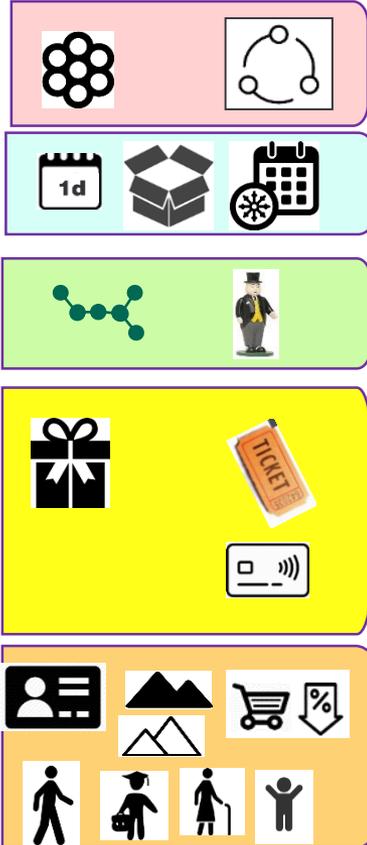
Family&Friends Railcard
Adult travellers get one third off the adult PLUSBUS day ticket price upon presentation of their valid Family&Friends Railcard:
 outside of the South East of England at all times;
 in the South East after the Monday to Friday morning peak period* (excluding Bank Holidays) for a journey wholly within the South East region.
 * times of off-peak services vary by route, but generally related to the availability of Off-Peak tickets.

Children MUST be charged the normal child PLUSBUS day ticket price (which is half the adult fare).

Railcard discount restrictions for PLUSBUS. Updated: 06/12/2017



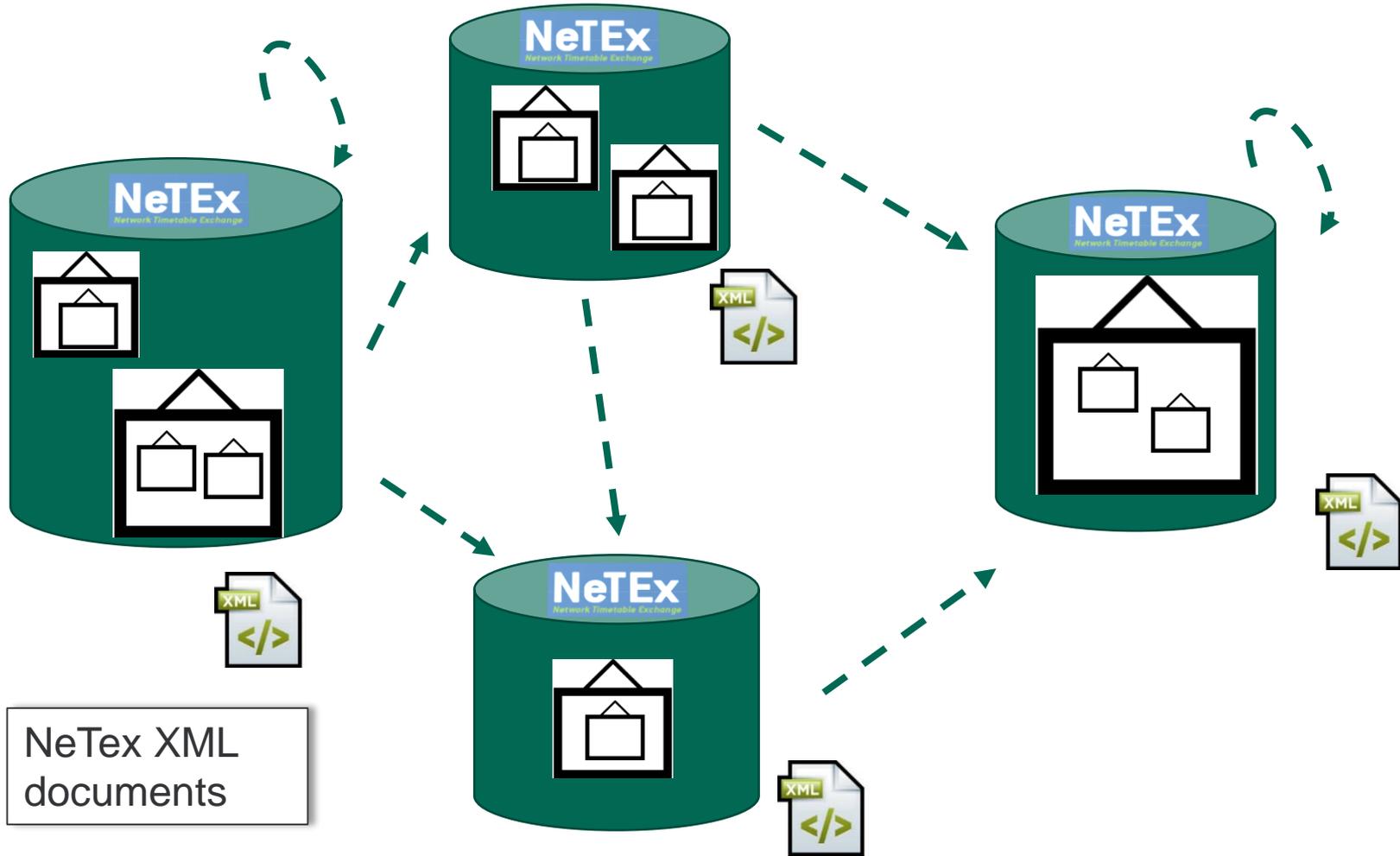
PLUS BUS – National bus fare trip supplements



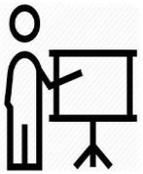
- ▶ Available as
 - Zonal day pass origin and destination stations
 - Zonal Season pass origin and destination stations
- ▶ Coverage
 - City wide Tariff zones around stations,
 - Named operators & Lines
 - Local exceptions
- ▶ Sales Packages / Distribution / Media
 - Add-on purchased with rail ticket /season pass
 - Bought separately to rail ticket or season pass
 - As paper ticket, on smartcard some areas
- Further discounts
 - Rail cards for different User types
 - Peak/Off-peak restrictions apply to railcard discounts
- ▶ Product Owner: JSP: Branding?



Modularise ; references may be internal or external



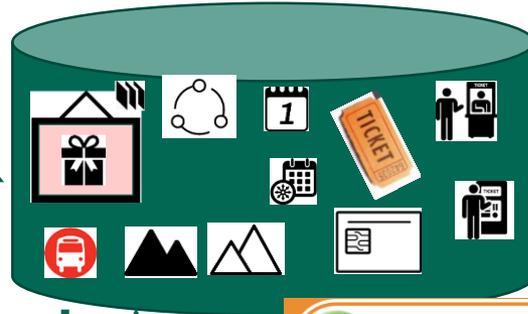
How to partition a Multi-operator product



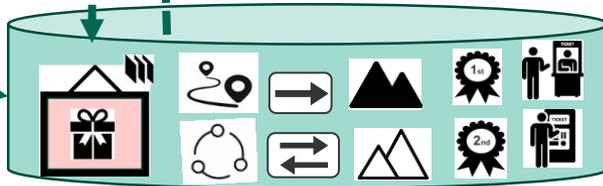
Plusbus Prices



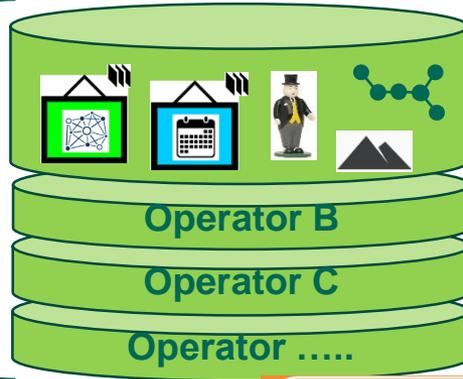
Plusbus Product definitions



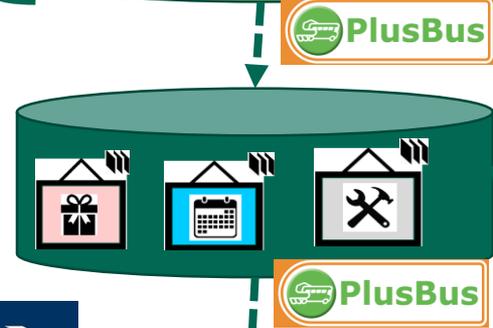
National Rail Travel Products



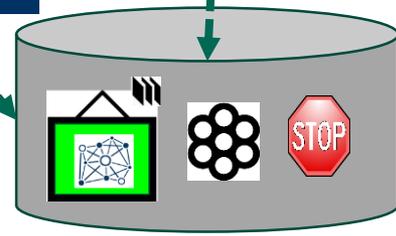
National Rail Railcard Products



Operator specific Lines & exceptions



Common Plus Bus definitions



National Stop & Plusbus Zone definitions (NPTG & NAPTAN)



Routes for which multiple Tariffs are applicable?



Metrobus 1 - Other Tariffs



1

Bewbush West - Crawley - Broadfield/Pease Pottage

Adult Single Fares

Bewbush West (loop)

160	Bewbush	Neighbourhood Centre							
240	160	Gossops Green	Shops						
240	240	160	West Green	Crawley Hospital/Apple Tree					
240	240	240	160	Crawley	Town Centre				
240	240	240	240	160	Southgate Avenue	North			
240	240	240	240	240	160	Southgate	Wensleydale		
240	240	240	240	240	240	160	Broadfield	(all stops)	
240	240	240	240	240	240	240	160	Pease Pottage	Black Swan

Fares are shown in pence. Eg. 170 = £1.70

To calculate your fare, find your location, and your destination, where the row and the column cross is your fare.

Return Fares

Not available on this service.

Child Fares

Child Fares are available on this route at half the adult fare on single journeys.

**Crawley Area Metrorider
Metrovoyager
Discovery Ticket
Gatwick Travelcard**

Accepted throughout.

PlusBus

Crawley, Three Bridges, Gatwick Airport, Ifield and Horley PlusBus tickets are valid throughout. Please see www.plusbus.info for further information.

Concessionary Passes

Concessionary passes are valid throughout from 0930-2300 Mon-Fri, and anytime at weekends and public holidays.





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Metrobus 1 - Other Tariffs

Metrobus Products

- Metrorider / Metrovoyager,
- Gatwick Employee Pass

1

Bewbush

Adult Single

160	Bewbush	Neighbourhood
240	160	Gossops Green
240	240	160
240	240	240
240	240	240
240	240	240

Fares

To calculate your fare, find the row and the column cross is your fare.

Return Fares

Not available on this service.

Child Fares

Child Fares at half price

24.01.17

Discovery Pass

- Offpeak Day Pass,
- Multi-operator

Plusbus:

- National, Local zones,
- Multi-operator
- Bundled with Rail Ticket

Concessionary Pass scheme

- Regional, Local zones,
- Time restrictions,
- Multi-operator

FARE PRODUCTS
(Other day & Period passes)

Crawley Area Metrorider Metrovoyager Discovery Ticket Gatwick Travelcard

Plusbus
Crawley, Three Bridges, Gatwick Airport, Ifield and Horley PlusBus tickets are valid throughout. Please see www.plusbus.info for further information.

Concessionary Passes

Concessionary passes are valid throughout from 0930-2300 Mon-Fri, and anytime at weekends and public holidays.

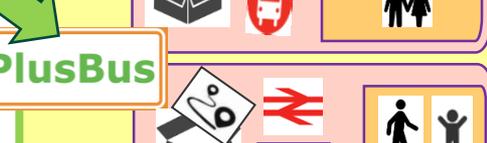
Metrorider

Discovery

Gatwick

PlusBus

NCS



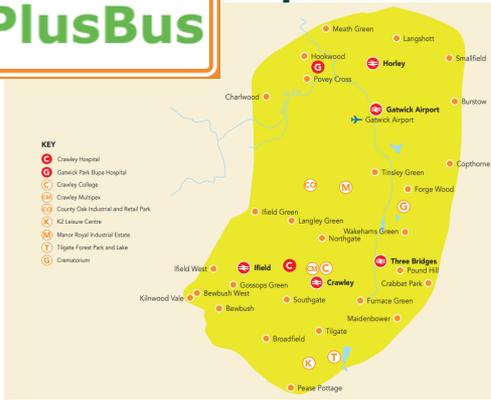
METROBUS



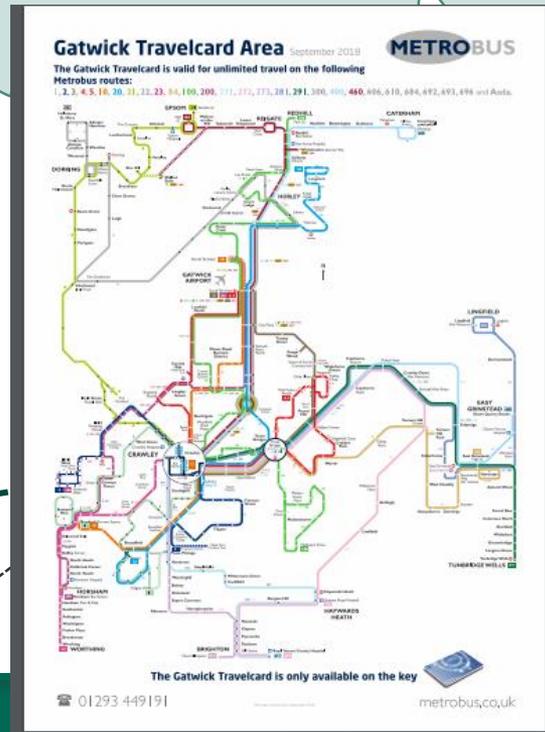
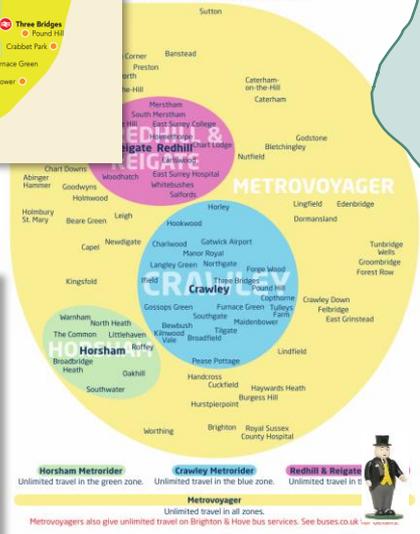
Multiple Tariffs applicable



Discovery Ticket, a one day travel ticket, allowing you to travel unlimited in West Sussex, East Sussex, Surrey, Brighton & Hove, East Hampshire, Kent and Medway on the following operated services:



Metrovoyager Ticket Zones



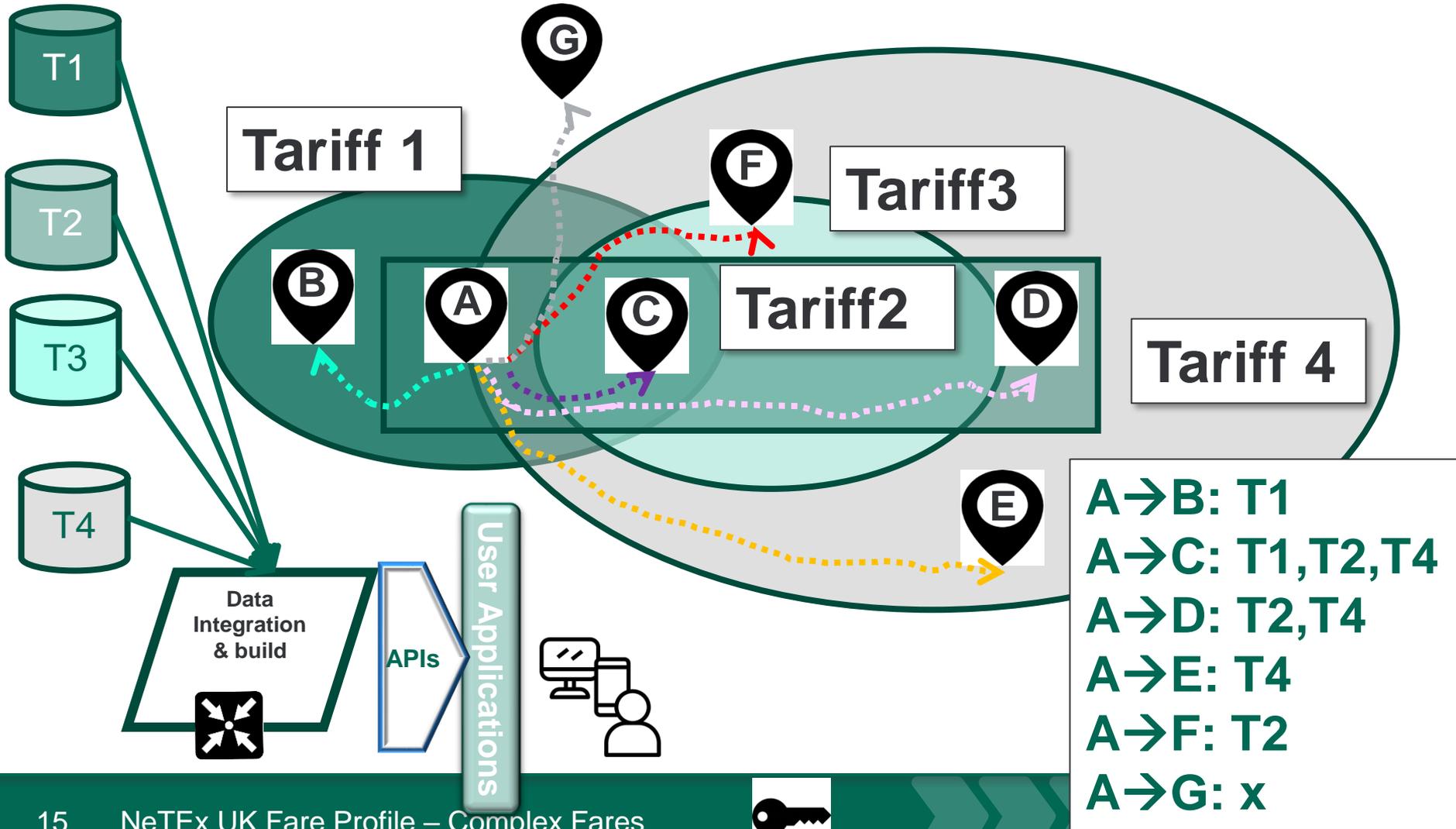
Concessionary Pass Schema



© Metrobus 2018



Each tariff describes itself; it is the trip planner/ fare engine's task to find the applicable, best value fares for given trip





	Dresden Hbf	Arnsdorf	Großharthau	Bischofswerda	Bautzen	Görlitz	Wroclaw
trilex-Tagesticket ab 21 € ¹	[Orange bar]						
Dresden-Wroclaw-Spezial ab 35 €	[Dark grey bar]						
Katzensprungticket 15 € ¹	[Pink bar]						
Katzensprungticket 10 € ¹	[Pink bar]						
VVO-Tarif				RE 1	ZVON-Tarif		
VVO-Tarif				RB 60	ZVON-Tarif		
VVO-ZVON-Übergangstarif ³							
Sachsen-Ticket							
Bahn-Tarif							



Trilex Tageskarte tariff: is an off-peak flat rate **day pass** available for journeys crossing the region, and also to go to Liberec (CR). Group discounts are available.



Dresden-Wroclaw-Spezial is a special discounted **period return trip** fare valid on a cross-border route between Dresden (DE) and Wroclaw (PL). Group discounts are available.



Katzensprung tariff is an off-peak tariff offering **day passes** at two different rates for different sections; only within Saxony, only for the specified routes.



VVO (*Verkehrsverbund Oberelbe*), and ZVON (*Zweckverband Verkehrsverbund Oberlausitz-Niederschlesien*) tariffs are regional P2P tariffs only available on certain parts of the network. Regional expresses (E.g. RE 20, RB61) cost more than regular trains.



Saxony tariff is a regional off-peak day pass offered by Deutsche Bahn and usable as far as the border. Group discounts are available.



Bahn tariffs are standard P2P rail tariffs charged by national rail operators such as Deutsche Bahn and Polish Railways; available for all sections of the journey.

<https://www.laenderbahn.com/trilex/tarife/tarife-und-fahrkarten/>



Modelling Sales Discount Rights





Additional Product Types - terminology



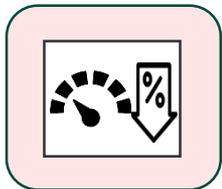
▶ **Discount Right**

The product gives the right to purchase other fare products for travel at a discount, but is not itself a ticket. (e.g. Rail card, Oyster card).



▶ **Capped Discount Right**

If there are multiple purchases, the purchase price is capped within a given time period (e.g. Oyster Card)



▶ **Usage Discount**

The product gives a discount or rebate based on access rights consumed within a given period. Requires an account.



▶ **Amount Of Price Unit**

The product holds an amount of stored value which can be used to purchase. May be linked to an account.





Rail Cards



SALE DISCOUNT RIGHT (FARE PRODUCT)

DISCOUNTING RULE

SALES OFFER PACKAGES

USER PROFILES

The screenshot shows the Railcard website with a navigation bar at the top containing 'Railcard', 'Contact Us', 'National Rail', and 'railcard.co.uk'. Below the navigation bar are links for 'Home', 'About Railcards', 'Travel Inspiration', and 'Railcard Savings', along with a search box. The main banner features the text '1/3 off rail fares. with our range of Railcards.' and a background image of a child with a kite. Below the banner is a grid of railcard options, each with a dropdown arrow:

- 16-25 Railcard
- Family & Friends Railcard
- Two Together Railcard
- Senior Railcard
- Network Railcard
- Disabled Persons Railcard
- 26-30 Railcard Trial

<https://www.railcard.co.uk/about-railcards/>

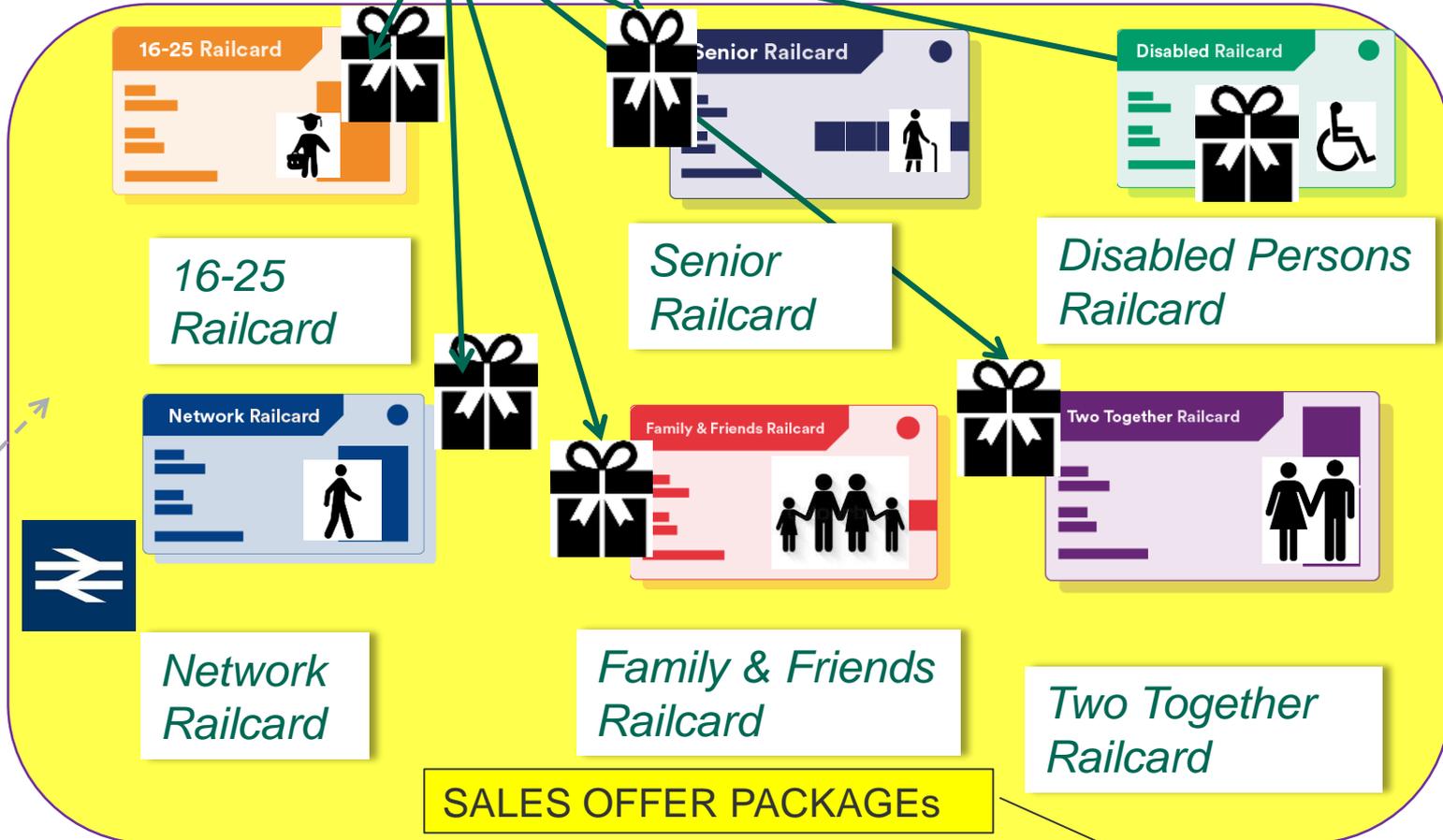
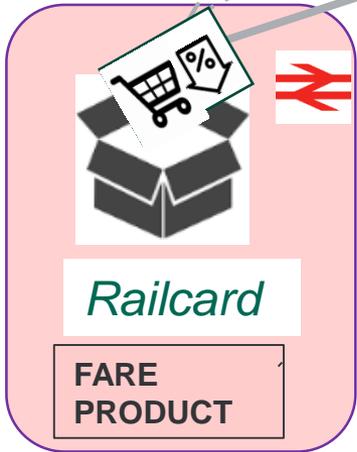


Department for Transport

UK Rail card products

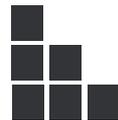
- ▶ Single FARE PRODUCT
- ▶ Multiple SALES OFFER PACKAGES
 - ▶ Different USER PROFILES
- ▶ Shared properties defined by GROUP OF SALES OFFER PACKAGES

Flat rate





Modelling Pay As You Go Capping





Pay as you go products – Technology options for charging

1. **Simple pre-payment** (E.g. Metrobus the Key)

- Made at start of each trip from stored value on card
- Card debited immediately

2. **Pre-payment, post payment adjustment for usage**

- Made at start of each trip from stored value on card, adjusted at check out or afterwards to reflect actual trip made
- Card linked to account – deferred adjustment to card balance on next trip.

3. **Pre-payment, post payment adjustment for usage, Capped** (E.g. Oyster Card)

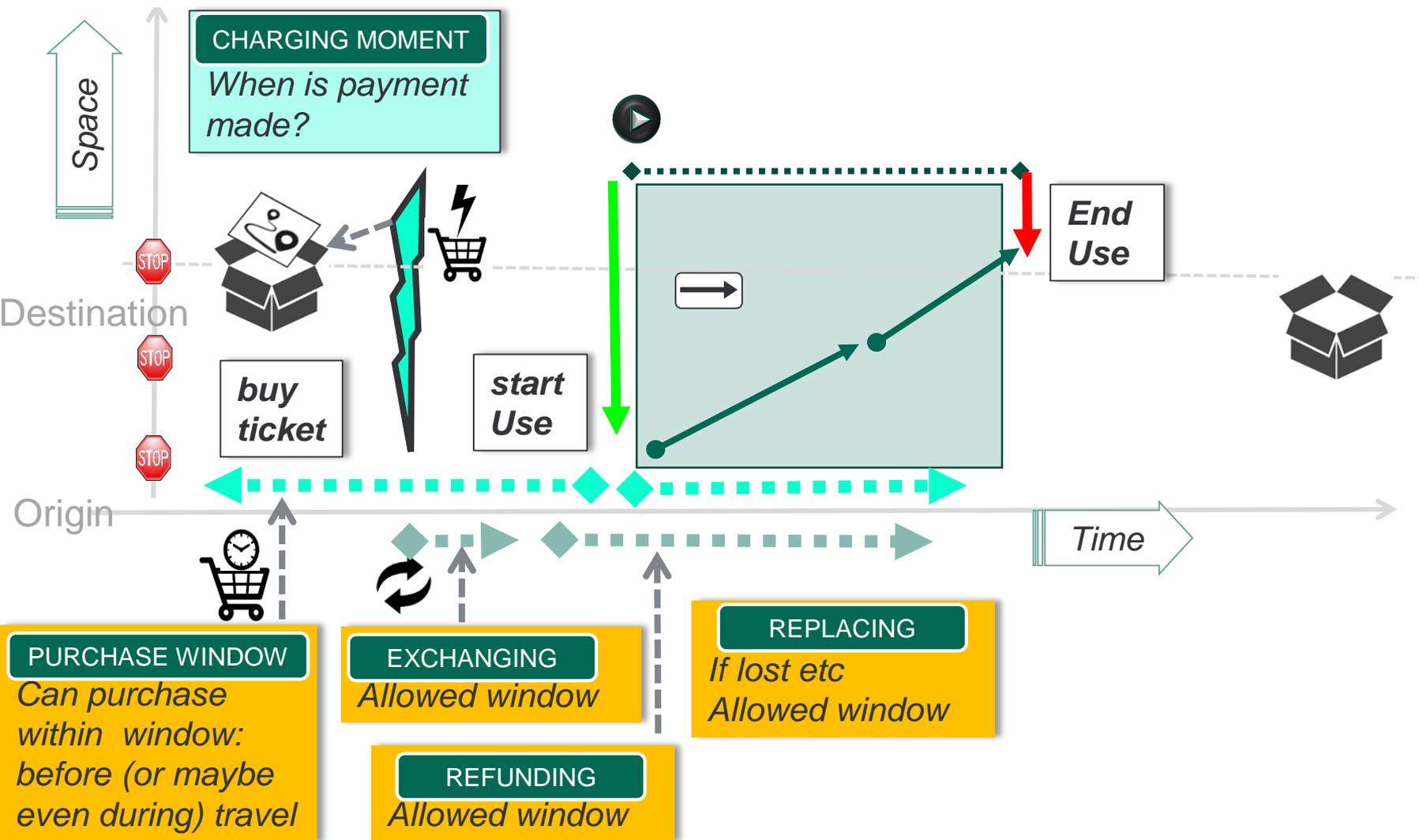
- Made at start of each trip from stored value on card, adjusted afterwards to reflect actual trip made
- Can be capped to a predefined amount within a given period, , account linked.

4. **Post-payment at end of period** (E.g. Oyster Contactless)

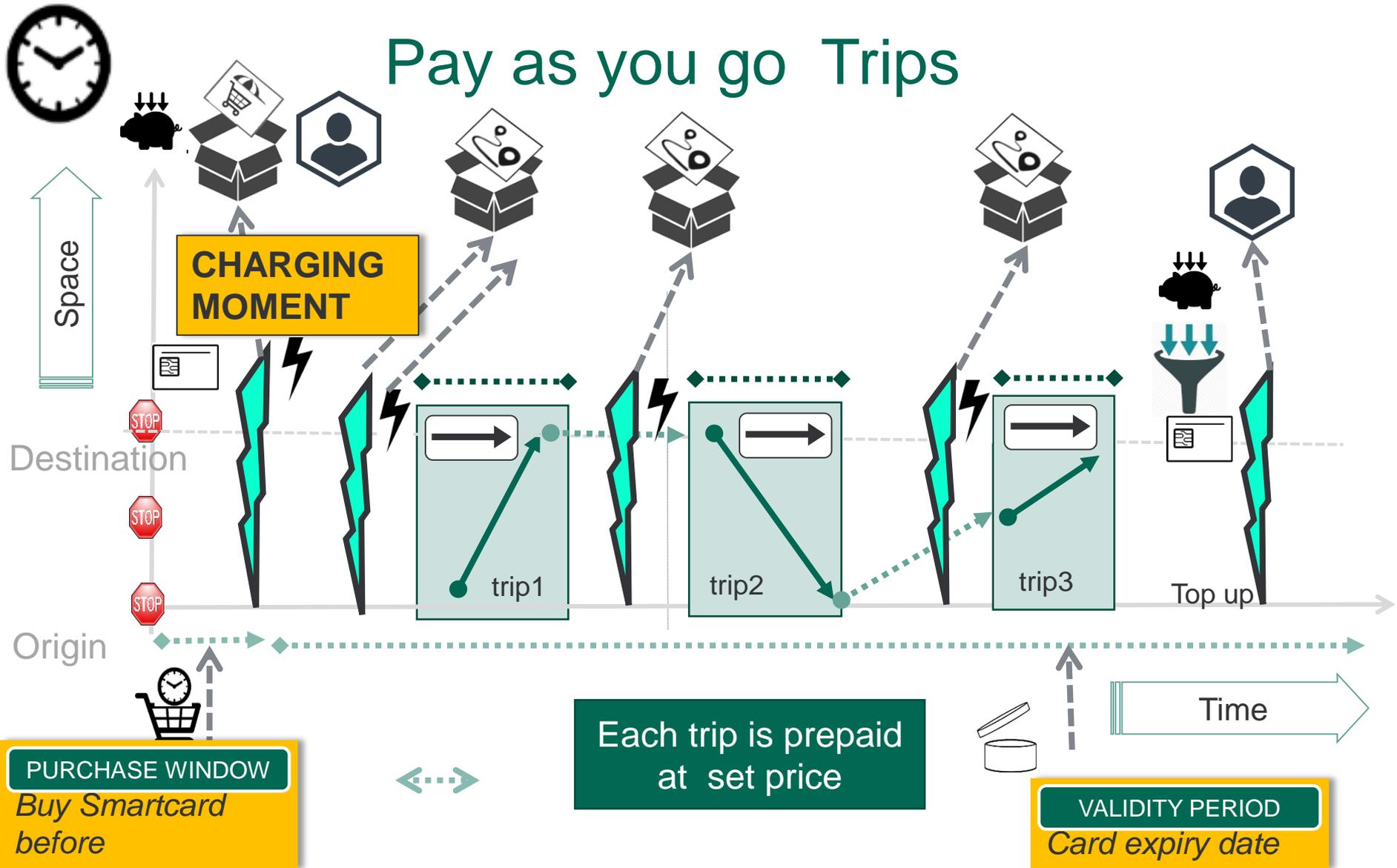
- Made at end of period , Card linked to account – deferred payment
- Can be capped or discounted to a predefined amount within a given period



Products – Prepaid CHARGING MOMENT

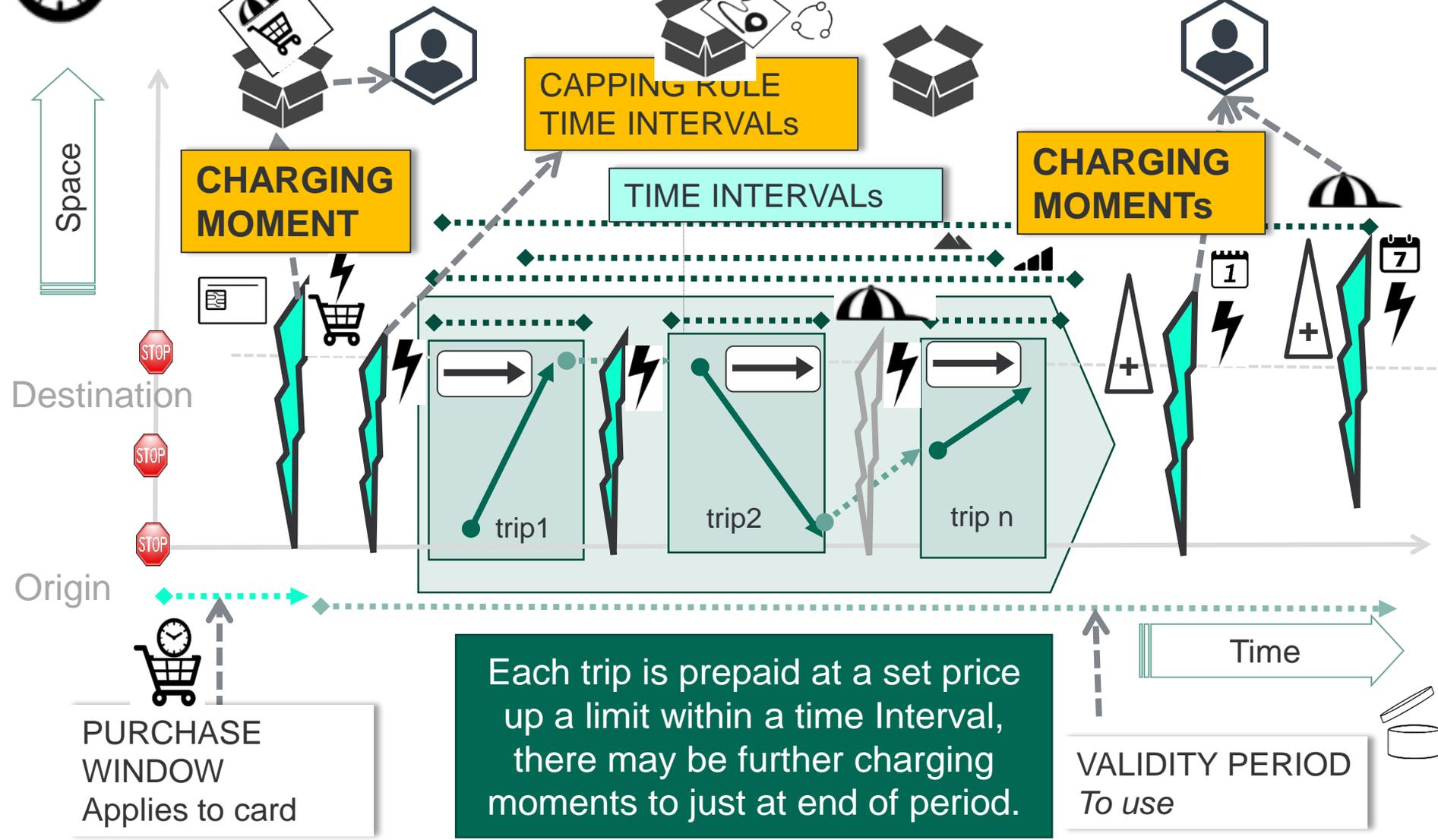


Pay as you go Trips





Pay as you go - Trips - Capped

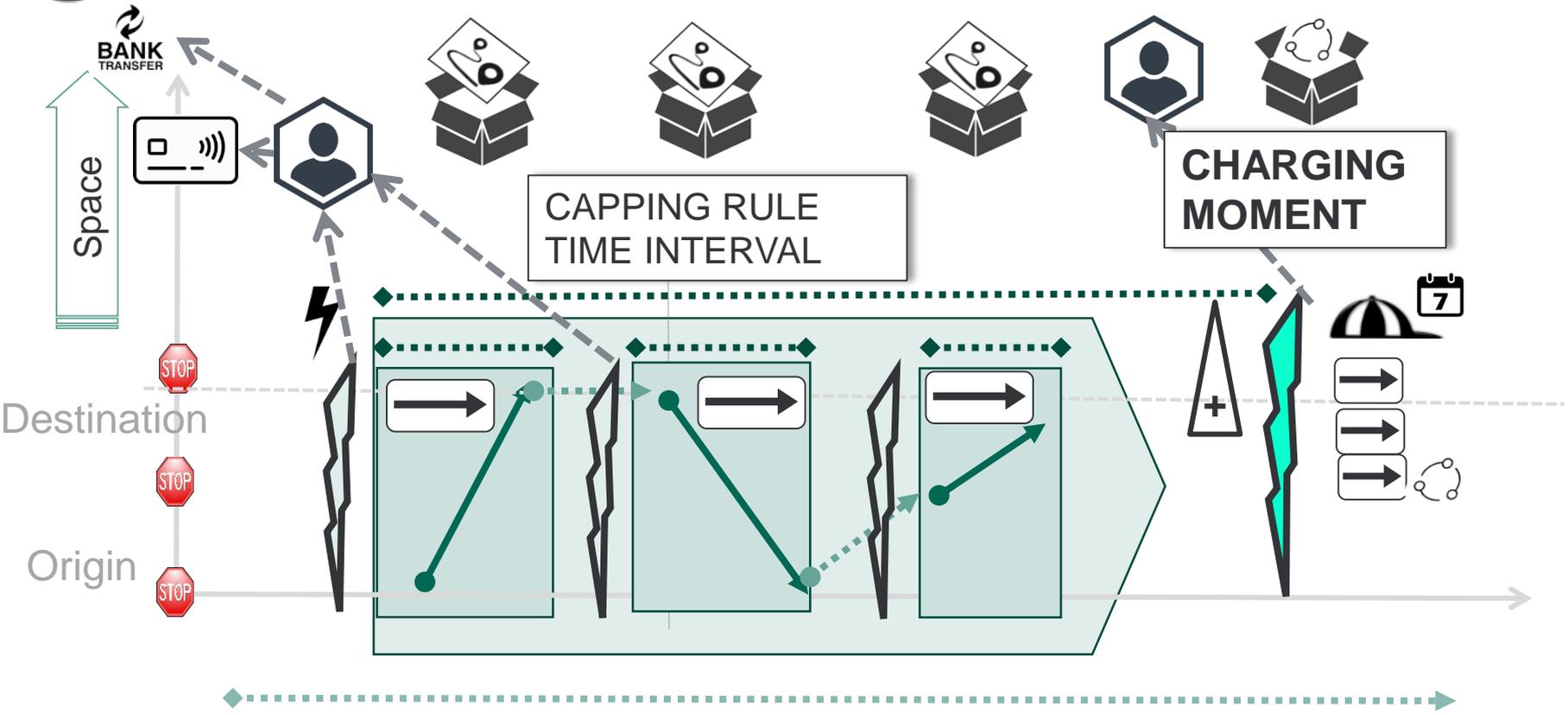


Each trip is prepaid at a set price up a limit within a time Interval, there may be further charging moments to just at end of period.





Pay as you go Trip – Contactless Capped



All trips are post paid at end of interval, capped if set price is reached

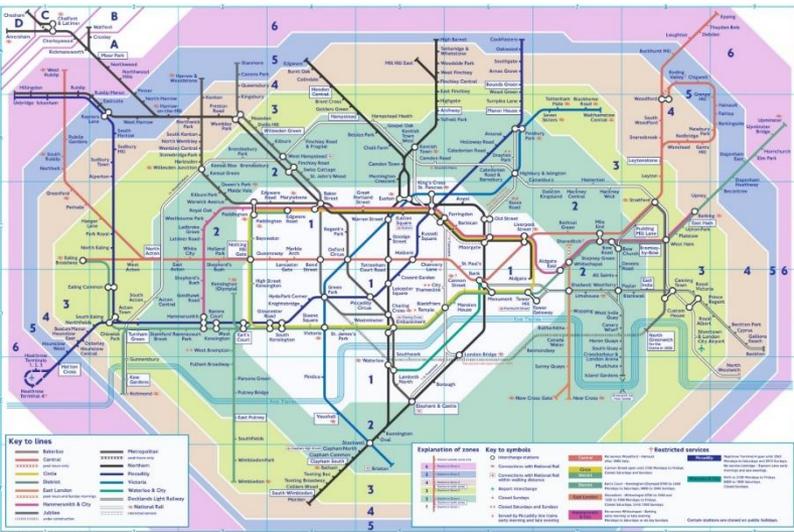
Time
VALIDITY PERIOD
Of card





Department
for Transport

Fares example - Tfl Oyster



[Accessibility](#) | [Help & Contact](#) | [Sitemap](#)

Search:

Home
Live travel news
Getting around
Tickets
Road users
Corporate
Business & partners

[Tickets](#) > **Fares**

[Tube, DLR and London Overground](#) | [National Rail](#) | [Single fare finder](#) | [Bus and tram](#) | [River](#) | [Emirates Air Line](#)

Save money with Oyster pay as you go

- Store credit and use it journey by journey
- Never run out of credit with Auto top-up
- Cheaper than cash for single fares

Travelcards

- Travel as much as you like, as often as you like
- Add Travelcards to your Oyster card

Adult
18+ student
16-18
11-15
5 - 10
Jobcentre Plus
Bus & Tram
Railcard
Groups

Adult

You need an Oyster card to:

- Use pay as you go and daily price capping
- Buy 7 Day, Monthly and longer period Travelcards

You do not need an Oyster card to pay cash single fares or to buy Day Travelcards.

Zone	Cash	Oyster pay as you go				Travelcards				
		Peak single	Off-peak single	Peak price cap	Off-peak price cap	Day Anytime	Day Off-peak	7 Day	Monthly	Annual
Zone 1 only	£4.50	£2.10	£2.10	£8.40	£7.00	£8.80	£7.30	£30.40	£116.80	£1,216
Zones 1-2	£4.50	£2.80	£2.10	£8.40	£7.00	£8.80	£7.30	£30.40	£116.80	£1,216
Euston - Zone 2*	£4.50	£2.20	£2.10	£8.40	£7.00	£8.80	£7.30	£30.40	£116.80	£1,216
Zones 1-3	£4.50	£3.20	£2.70	£10.60	£7.70	£11.00	£8.00	£35.60	£136.80	£1,424
Euston - Zone 3*	£4.50	£3.00	£2.70	£10.60	£7.70	£11.00	£8.00	£35.60	£136.80	£1,424
Zones 1-4	£5.50	£3.80	£2.70	£10.60	£7.70	£11.00	£8.00	£43.60	£167.50	£1,744
Euston -	£5.50	£3.40	£2.70	£10.60	£7.70	£11.00	£8.00	£43.60	£167.50	£1,744

Fares example - TfL Oyster

Transport for London

Search: Search

Home Live travel news Getting around **Tickets** Road users Corporate Business & partners

Tickets > Fares

Tube, DLR and London Overground | National Rail | Single fare finder | Bus and

GROUP TICKETS

Save money with

- Store credit and
- Never run out of
- Cheaper than cash

DISCOUNT RIGHTS Railcard

Travelcards

- Travel as much as you like, as often as you like

MODES Metro, Bus, Tram, River

Adult 18+ student 16-18 11-15 5-10 Jobcentre Plus Bus & Tram Railcard Groups

FARE DEMAND FACTOR

TIME INTERVALS

1 7 31

Adult

You need an Oyster card to:

- Use pay as you go and daily price capping
- Buy 7 Day, Monthly and longer period Travelcards

You do not need an Oyster card to pay cash single fares or to buy Day Travelcards.

Zone	Cash	Oyster pay as you go				Travelcards				
		Peak single	Off-peak single	Peak price cap	Off-peak price cap	Day Anytime	Day Off-peak	7 Day	Monthly	Annual
Zone 1 only	£4.50	£2.10	£2.10	£8.40	£7.00	£8.80	£7.30	£30.40	£116.80	£1,216
Zones 1-2	£4.50	£2.80	£2.10	£8.40	£7.00	£8.80	£7.30	£30.40	£116.80	£1,216
Euston Zone 2*	£4.50	£2.20	£2.10	£8.40	£7.00	£8.80	£7.30	£30.40	£116.80	£1,216
Zones 1-3	£4.50	£3.20	£2.70	£10.60	£7.70	£11.00	£8.00	£35.60	£136.80	£1,424
Euston Zone 3*	£4.50	£3.00	£2.70	£10.60	£7.70	£11.00	£8.00	£35.60	£136.80	£1,424
Zones 1-4	£5.50	£3.80	£2.70	£10.60	£7.70	£11.00	£8.00	£43.60	£167.50	£1,744
Euston Zone 4*	£5.50	£3.40	£2.70	£10.60	£7.70	£11.00	£8.00	£43.60	£167.50	£1,744

TYPES OF TRAVEL DOCUMENTS
Paper, Oyster,



USER PROFILES
Adult, student, 11-15 etc



FARE PRODUCTS
Trip, Period Pass



SALES PACKAGES
Cash, Oyster, Travelcard



FARE PRICES



FARE ZONES
1-6, A, B, C, D



Zone Doughnut - TfL Zones

TOPOGRAPHICAL PLACES

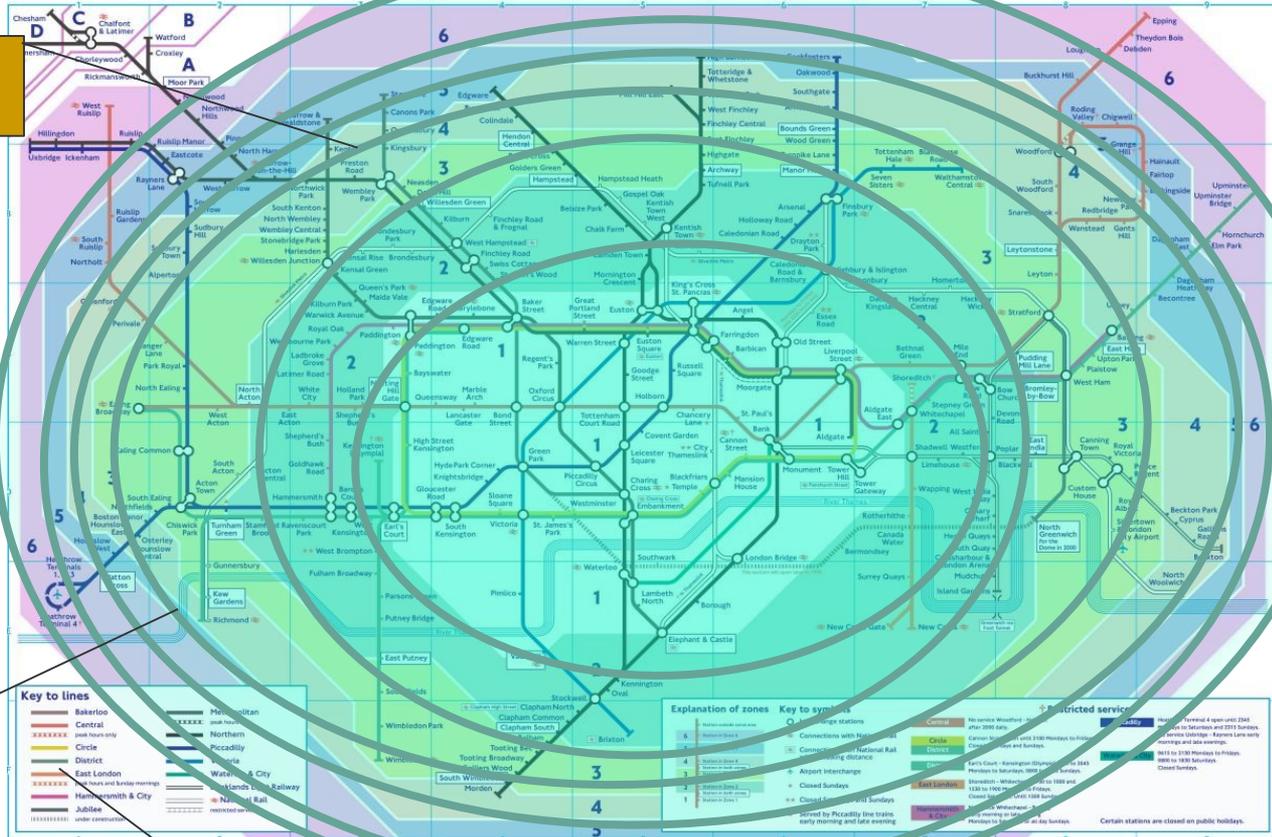


FARE ZONES
1-6, A, B, C, D

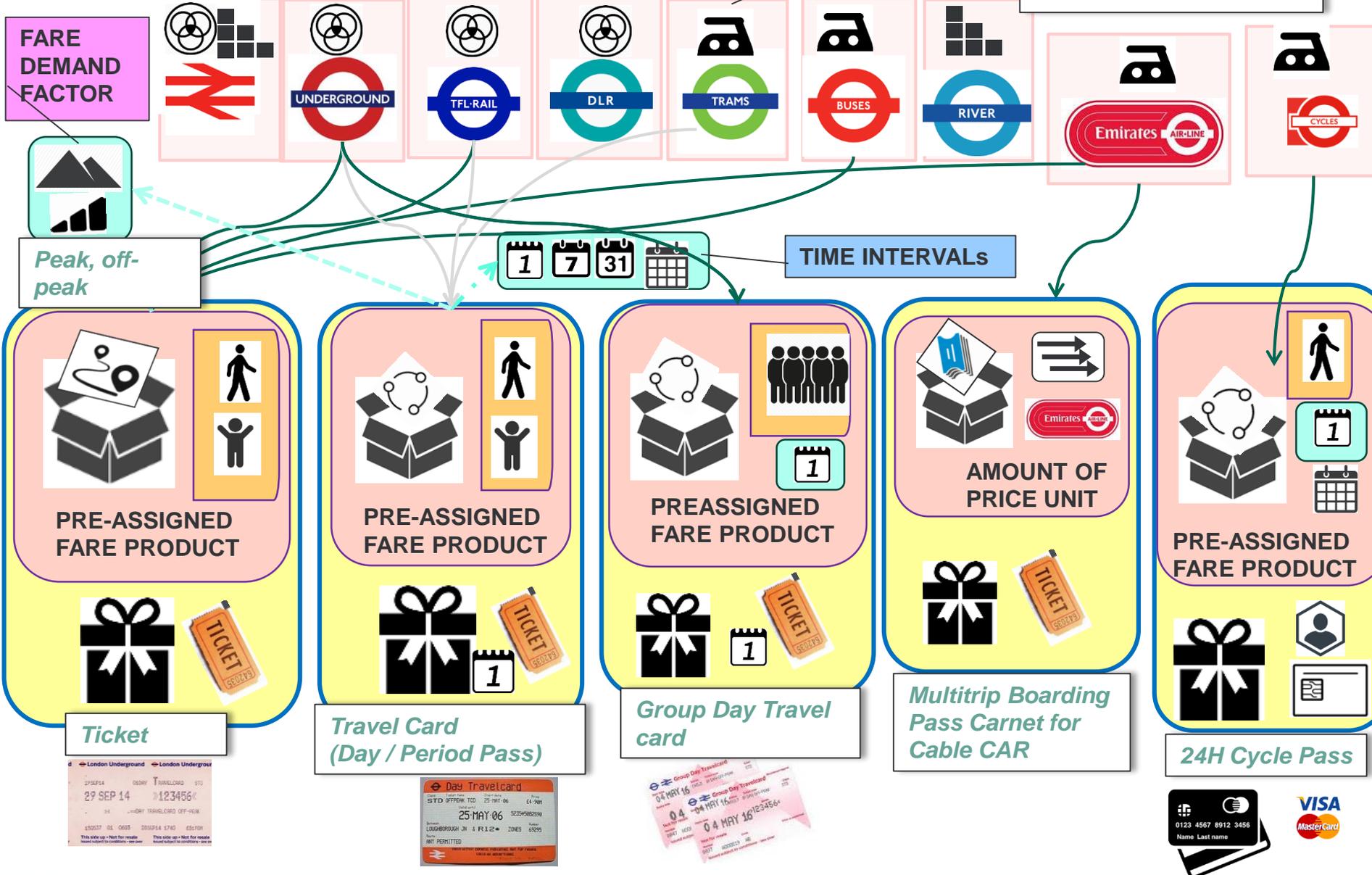


SCHEDULED STOP POINTS

LINES



Classic TfL Products



What's in an Oyster ?

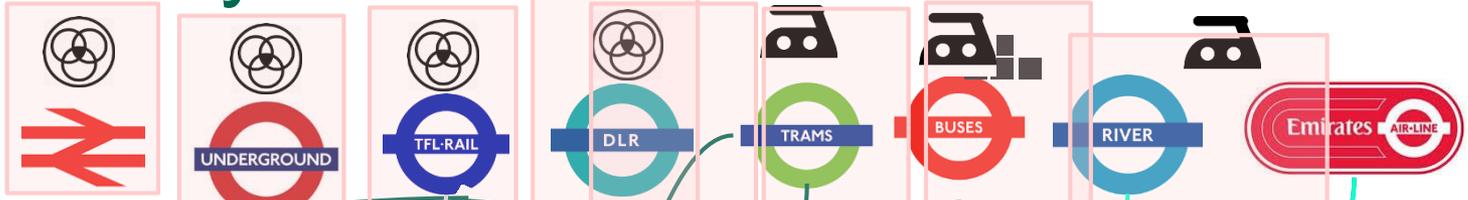
TIME INTERVALS
Day, Week, Season.rtv

1 7 31



FARE DEMAND
Peak, Offpeak

TARIFFS



5+reward

PRE-ASSIGNED FARE PRODUCT

AMOUNT OF PRICE UNIT

CAPPED SALE DISCOUNT RIGHT

SALE DISCOUNT RIGHT

USAGE DISCOUNT RIGHT

CAPPED DISCOUNT RIGHT

SALE DISCOUNT RIGHT

USAGE DISCOUNT RIGHT

CUSTOMER ACCOUNT

Oyster Pay As You Go



Oyster Contactless





Account Based Ticketing



- ▶ **Account Based Ticketing** – The product may be linked with an online account . E.g. Pay as you go, or Usage based discounts, Subscription with automatic payment or renewal



- **Customer Account.** The fare product is linked to a Customer account. The customer's identity is known to the operator.

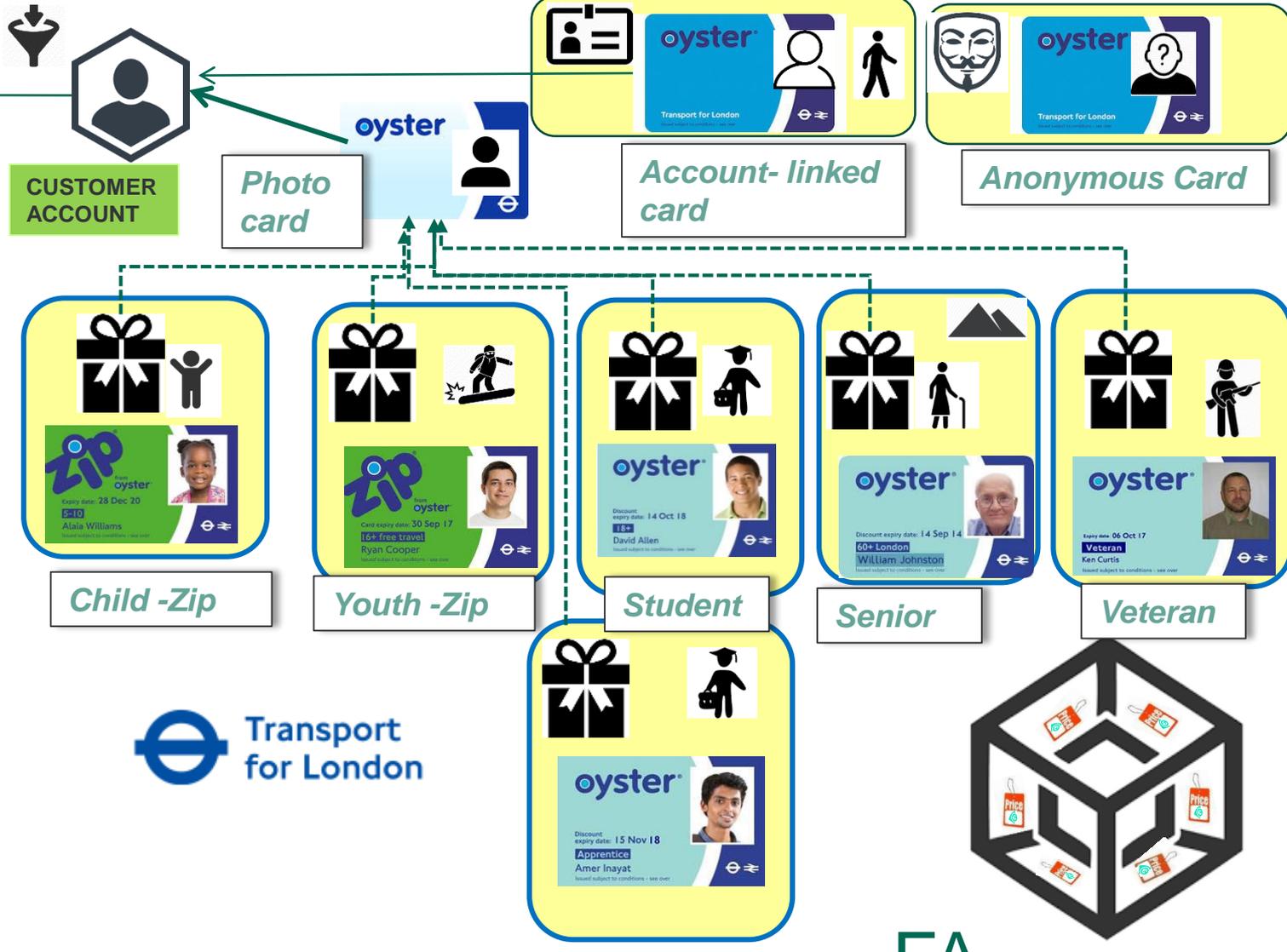


- **Anonymous Customer Account.** The product is linked to a Customer but the Customer is not necessarily known to the Operator (e.g. by means of a an anonymous token, or card only product)

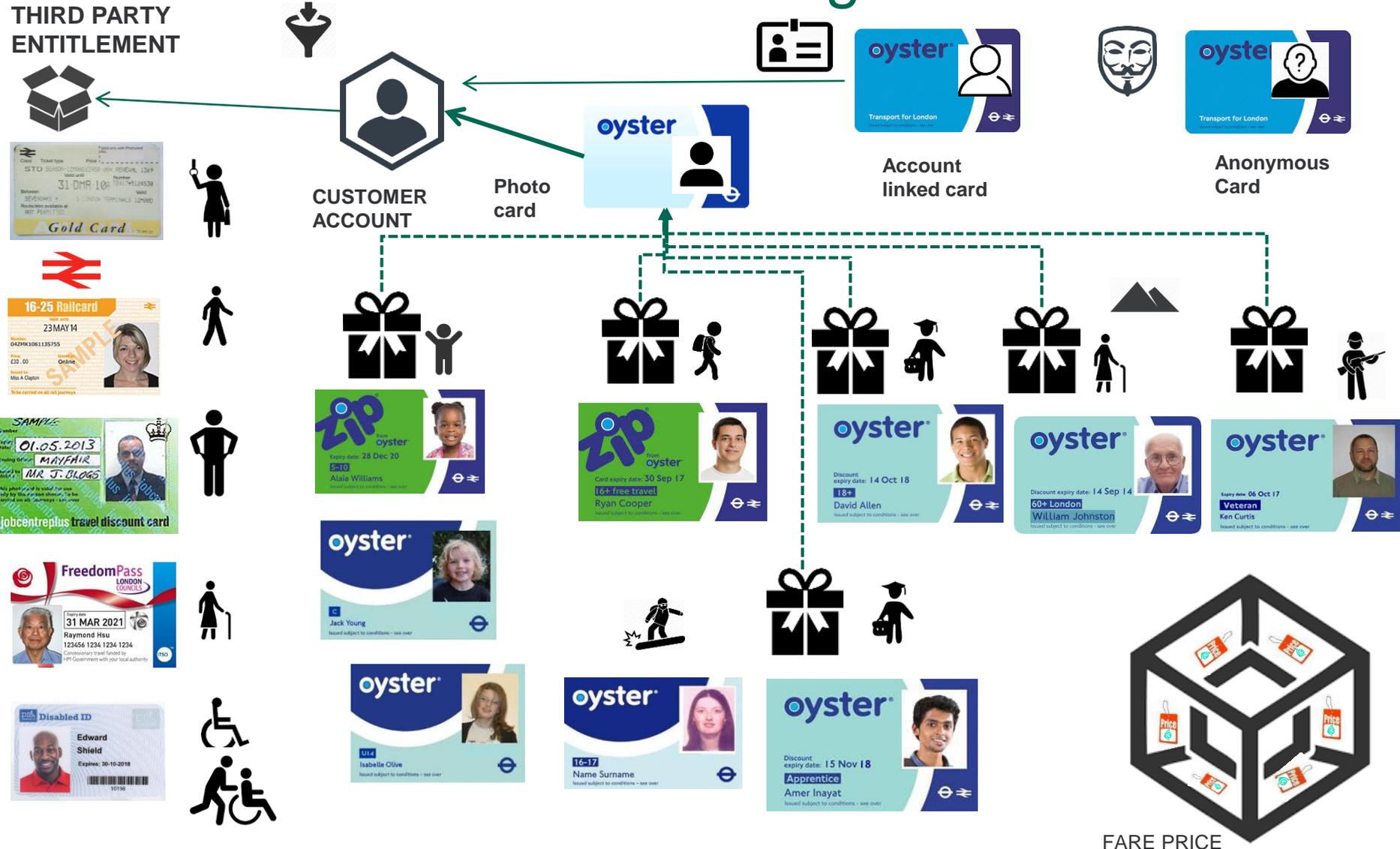
- ▶ **Auto top up** – balance increases if falls below a threshold
- ▶ **Subscription** – product automatically renewed
- ▶ **Pay by Installment** – Annual subscription paid monthly



Sales Offer Packages & Accounts



Sales Offer Packages & Accounts





Complex UK Bus Fare Products

Discount cards, etc



	FARE PRODUCT	Peak / Off Peak	(Can) or Must be Account Based	Notes
SALES DISCOUNT	SALES DISCOUNT RIGHT	✓	✓	E.g. like a Railcard
	CAPPED SALES DISCOUNT RIGHT	✓	✓	PAYG e.g. Oyster
USAGE DISCOUNT	USAGE DISCOUNT RIGHT	✓	✓	Rebate for use, e.g. mileage
STORED VALUE	AMOUNT OF PRICE UNIT	-	✓	Stored value
ENTITLING PRODUCT	THIRD PARTY PRODUCT	-	-	E.g. Military Pass



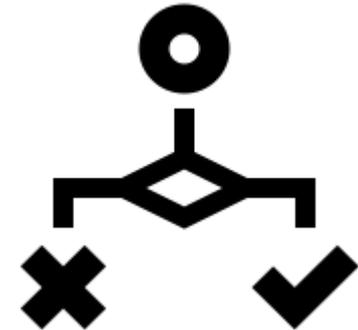
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Specifying Complex Conditions

Parameter Assignments

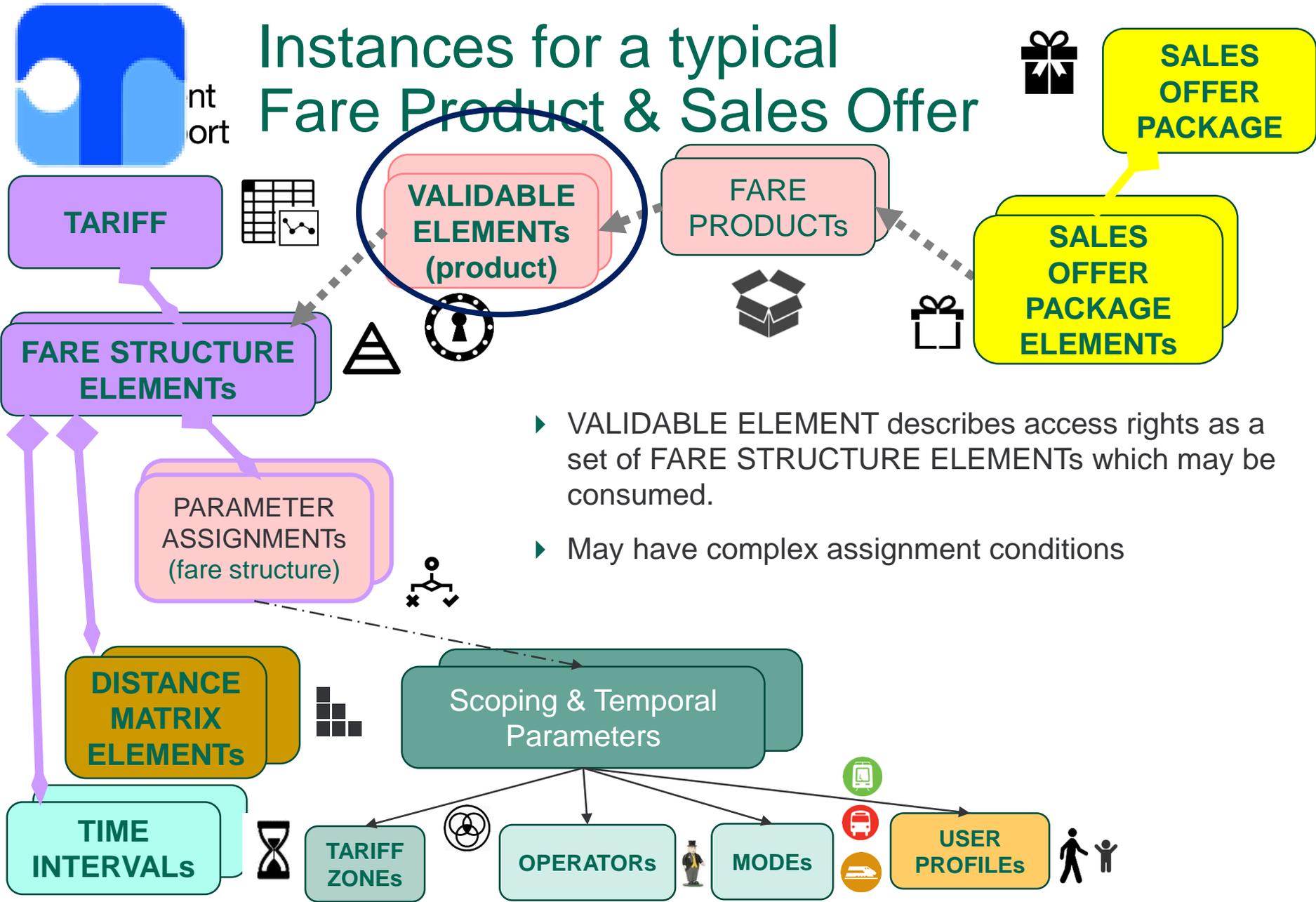


Using Parameters #1



- ▶ Generic Assignment:
 - ▶ List of parameters. Can be Ored or ANDed
 - *Eg 1st Class | Second Class*
 - *E.g. 1st Class & Private Compartment | 2nd Class & Couchette Berth*
 - ▶ **Can be used to build complex conditions:**
 - *Eg Travel times for zones.*
 - *Zone 1 allows 30 minutes, Zone 2 allows 60 Minutes*
 - *E.G. Exclusions to services*
 - *Plusbus zone: Night Buses after 22.40, Line 23 Excluded*
 - *E.G. Timebands into London etc*
 - *Arriving into Liverpool street between 8:00 and 9:30 am*
 - *E.g. Fare Demand restrictions*
 - *Students and Seniors can only get half price off peak*

Instances for a typical Fare Product & Sales Offer

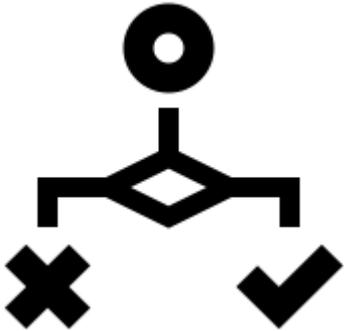


- ▶ VALIDABLE ELEMENT describes access rights as a set of FARE STRUCTURE ELEMENTs which may be consumed.
- ▶ May have complex assignment conditions



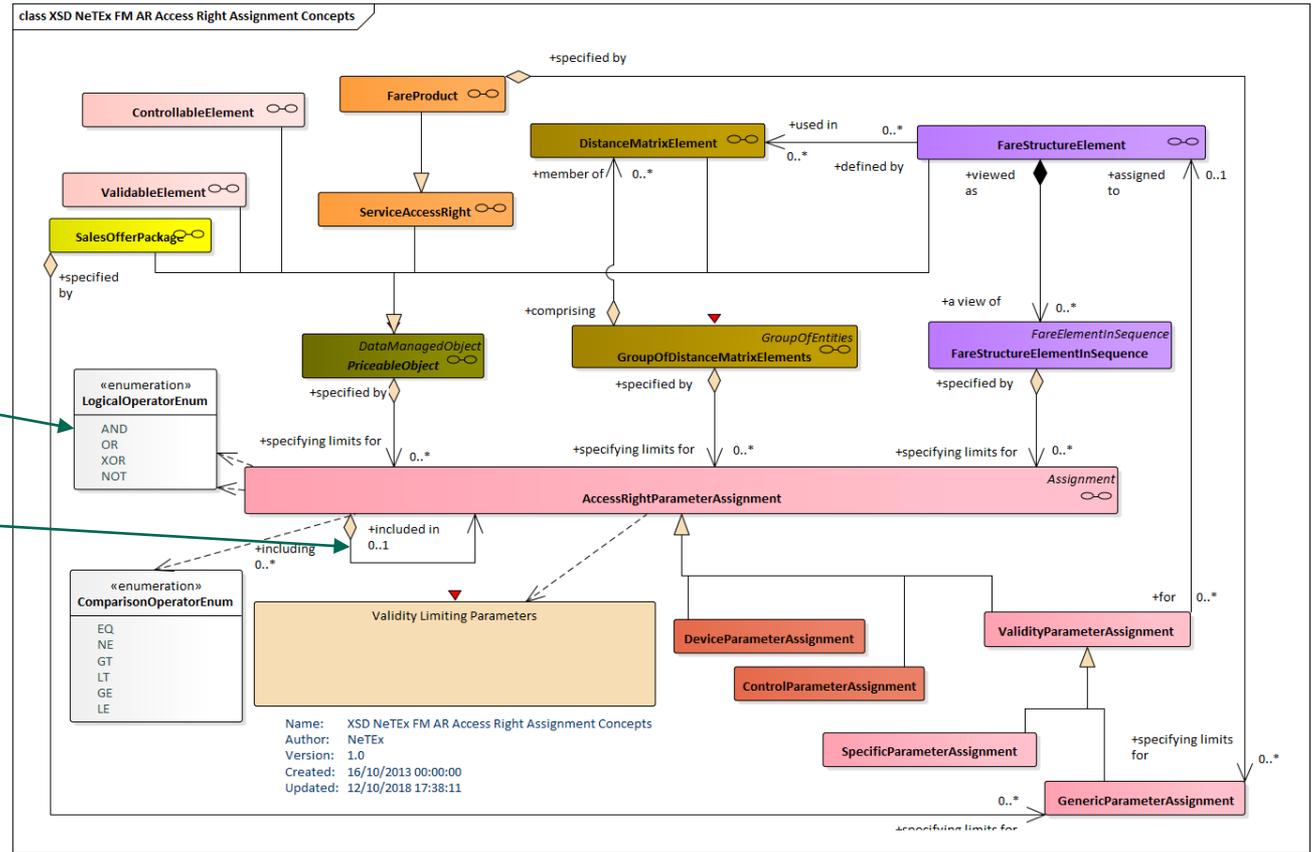


Assignments can be ANDed and ORed together and nested to build complex conditions



AND /OR

NESTING





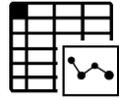
Department for Transport

Instances for a typical Fare Product & Sales Offer



SALES OFFER PACKAGE

TARIFF



VALIDABLE ELEMENTS (product)

FARE PRODUCTS

SALES OFFER PACKAGE ELEMENTS

FARE STRUCTURE ELEMENTS



PARAMETER ASSIGNMENTS (validable element)

PARAMETER ASSIGNMENTS (product)

PARAMETER ASSIGNMENTS (sales offer element)

PARAMETER ASSIGNMENTS (fare structure)

DISTANCE MATRIX ELEMENTS



Scoping & Temporal Parameters

PARAMETER ASSIGNMENTS (sales offer)

TIME INTERVALS



TARIFF ZONES

OPERATORS



USER PROFILES

DAY TYPES

MODEs

Etcetera



Complex time restrictions – Directional Peak/ Off-peak/ Superoff-peak-

FARE DEMAND FACTORS (Anytime / Off peak/ Super Off-peak),

When are Off-Peak and Super Off-Peak tickets valid?

Off-peak, Off-Peak Day and Super Off-Peak Day tickets (including First Class versions and Day/Family Travelcards) to and from London* are valid at the following times:

Times	Arriving into London*	Departing from London*	Exceptions		
Morning (Monday - Friday)	Off-Peak and Off-Peak Day: Not to arrive Liverpool St before 10:00 Super Off-Peak Day: Not to arrive Liverpool St before 12:00 (Stratford 11:52)	Off-Peak: Not to leave Liverpool St before 09:30 (Stratford 09:38, Seven Sisters and Tottenham Hale 09:40) Off-Peak Day: Not before 09:30 from all stations Super Off-Peak Day: Not before 12:00 from Liverpool St (Stratford 12:07)	Off-Peak and Off-Peak Day: From London: Valid on the following services: 09:28 to Cambridge (to Cheshunt and beyond). 09:02 to Ipswich (Stratford, 09:09) (to stations on the Sudbury branch only). 09:18 to Clacton-on-Sea (Stratford, 09:25) (to Wivenhoe and beyond, including to Walton-on-the-Naze). To London: Valid on the following services: 08:11 from Clacton-on-Sea and intermediate stations to Wivenhoe, including the 08:00 from Walton-on-the-Naze by changing at Thorpe-le-Soken. 08:28 from Harwich Town and intermediate stations to Mistley.		

DAY
TYPE

TIMES AT STOP

GENERIC PARAMETER
ASSIGNMENTS (Exceptions)

SERVICE JOURNEYS

Times	Arriving into London*	Departing from London*	Exceptions
Evening (Monday - Friday)	No restrictions	Off-Peak: Not to leave Liverpool St between 16:29-18:34 (Stratford 16:36-18:41, Tottenham Hale 16:41-18:40, Seven Sisters 16:45-18:49) Off-Peak Day: No restrictions (except on Day Travelcards to Ipswich and beyond which have Off-Peak restrictions as above). Super Off-Peak Day: Not to leave Liverpool St between 15:59-19:01 (Stratford 16:06-19:08)	During school holidays** and half-term weeks, including the Christmas and New Year period, evening restrictions on all Off-Peak tickets departing London are lifted. Restrictions remain in force on Super Off-Peak Day tickets. **Suffolk school holiday dates are used. Off-Peak period returns are also valid at all times on the following services from Liverpool St: 16:30, 16:32 and 18:30 (to stations on the Felixstowe branch only). Includes Off-Peak Day Travelcards and Off-Peak Singles. 16:34 (Stratford, 16:42) (to stations on the Braintree branch only). 18:12 (Stratford, 18:20) (to stations on the Sudbury branch only). 18:32 (Stratford, 18:40) (to Hatfield Peverel, Kelvedon, Alresford and stations to Walton-on-the-Naze only).
Weekends and Bank Holidays	No restrictions	No restrictions	None



*Please note that 'London' includes Liverpool Street, Stratford, Seven Sisters, Tottenham Hale and intermediate stations such as Hackney Downs. Unless specified, restrictions from stations other than Liverpool Street are determined by when the service arrives at or departs from Liverpool Street (or Stratford where trains start and finish there).

SCHEDULED STOP POINTS

Tickets which do not involve travel to, from or via central London are generally restricted in the morning period only. Typically, Off-Peak and Off-Peak Day tickets are valid after 08:45 or 09:00 outside Greater London, and after 09:30 for journeys outwards from the London suburbs, and Super Off-Peak Day tickets are valid after 12:00. Please enquire as to the restrictions applying to the journey you wish to make.

Off-Peak and Super Off-Peak tickets for long-distance journeys via London have various restrictions depending on the journey being made. The time restrictions in the table may not apply, especially for tickets from south of Manningtree/Harwich and Ely/Cambridge to destinations outside the London and South-East area. Please check our online booking engine or ask ticket office staff.

If you're unsure about the time restrictions that apply to your journey, it's always recommended to check with the ticket office or the Greater Anglia Contact Centre on 0345 600 7245.



Graphic for directional time restrictions (East Midlands)





- ▶ **Anytime Single** – Fully flexible
- ▶ **Off Peak Single** – Semi-flexible. Also Super-Off peak for some operators.
- ▶ **Advance Single** – Semi flexible, no refund, quota restricted

Ticket restrictions Close X

OFF-PEAK SINGLE
TICKET TYPE
OFF-PEAK

DESCRIPTION
Flexible ticket only valid at specific off-peak times of the day.

VALIDITY
Your journey must be on off-peak trains on the date specified. Off-peak times vary by route - our journey planner only shows off-peak tickets on trains for which they are valid.

BOOKING
Can be booked in advance or purchased on the day of travel.

REFUNDS
If you decide not to use your ticket to make all or part of your intended journey then you can apply for a refund from the My Account pages, or through Customer Support within 28 days of expiry of the ticket. A GBP 10.00 administration fee will apply and the amount of the refund will take into account any use you have made of the ticket and in some circumstances no refund will be paid.

AMENDING YOUR BOOKING
You can change the time of your journey without changing your tickets. If you wish to change your date of travel or Class of ticket, you will need to buy a new ticket and apply for a refund on your current ticket.

DISCOUNTS
Yes - normal railcard and child discounts available.

BREAK OF JOURNEY
Break of journey is generally permitted unless prohibited for the journey that you are making. If you intend to break your journey, please contact us to check if it is permitted. You can always break your journey where necessary to change train.

FARE PRODUCTS



Ticket restrictions Close X

ADVANCE SINGLE
TICKET TYPE
ADVANCE

DESCRIPTION
Non-refundable ticket, only valid for the date, time and trains specified.

VALIDITY
You must travel on the date, time and trains specified. You may not start, break and resume, or end your journey at any intermediate station except to change to/from connecting trains as shown on the ticket(s) or other valid travel itinerary.

BOOKING
Can be booked up until the day before travel, subject to availability.

REFUNDS
No refunds available.

AMENDING YOUR BOOKING
Yes - date/time of tickets can be changed up until time of departure (except if you have chosen to print your own e-ticket(s) or have chosen for your ticket(s) to be delivered to your mobile phone) subject to the payment of a GBP 10.00 fee per ticket per person and any difference in fares. It is not possible to purchase a cheaper fare than the original, nor to change the origin or destination.

DISCOUNTS
Child discounts, 16-25 Railcard, Family and Friends Railcard (standard class only), Senior Railcard, Two Together Railcard, HM Forces and Disabled Persons Railcards discounts apply.

Ticket restrictions Close X

ANYTIME SINGLE
TICKET TYPE
ANYTIME

DESCRIPTION
Flexible ticket with no time restrictions on when you can travel.

VALIDITY
Your journey must be on the date, or the day after the date, specified on the ticket.

BOOKING
Can be booked in advance or purchased on the day of travel.

REFUNDS
If you decide not to use your ticket to make all or part of your intended journey then you can apply for a refund from the My Account pages, or through Customer Support within 28 days of expiry of the ticket. A GBP 10.00 administration fee will apply and the amount of the refund will take into account any use you have made of the ticket and in some circumstances no refund will be paid.

AMENDING YOUR BOOKING
You can change the time of journey without changing your tickets. If you wish to change your date of travel or Class of ticket, you will need to buy a new ticket and apply for a refund on your current ticket.

DISCOUNTS
Yes - normal railcard and child discounts available.

BREAK OF JOURNEY
You may start, break and resume, or end your journey at any intermediate station along the route of travel.

Route
Travel is allowed via any permitted route.





Standard UK Rail Return Trip Products

- ▶ Anytime Return – Fully flexible
- ▶ Off Peak Return – semi-flexible
- ▶ (No advance returns)

FARE PRODUCTS

Ticket restrictions



ANYTIME RETURN
TICKET TYPE
ANYTIME

DESCRIPTION
Flexible ticket with no time restrictions on when you can travel.

VALIDITY
The outward portions of Anytime Returns are valid for five days including the date on the ticket. You must return within one calendar month of the outward travel date specified.

BOOKING
Can be booked in advance or purchased on the day of travel.

REFUNDS
If you decide not to use your ticket to make all or part of your intended journey then you can apply for a refund from the My Account pages, or through Customer Support within 28 days of expiry of the ticket. Please note, the outward portion cannot be refunded if the return portion has been used. A GBP 10.00 administration fee will apply and the amount of the refund will take into account any use you have made of the ticket and in some circumstances no refund will be paid.

AMENDING YOUR BOOKING
You can change the time of your outward journey and the date and time of your return journey without changing your tickets. If you wish to change your date of travel or Class of ticket, you will need to buy a new ticket and apply for a refund on your current ticket.

DISCOUNTS
Yes - normal railcard and child discounts available.

BREAK OF JOURNEY
You may start, break and resume, or end your journey at any intermediate station along the route of travel.

OTHER CONDITIONS

£58.40

Ticket restrictions

OFF-PEAK RETURN (1ST CLASS)
TICKET TYPE
OFF-PEAK

DESCRIPTION
Flexible ticket only valid at specific off-peak times of the day.

VALIDITY
Your outward journey must be on off-peak trains on the date specified, and you must return on off-peak trains within one calendar month. Off-peak times vary by route - our journey planner only shows off-peak tickets on trains for which they are valid.

BOOKING
Can be booked in advance or purchased on the day of travel.

REFUNDS
If you decide not to use your ticket to make all or part of your intended journey then you can apply for a refund from the My Account pages, or through Customer Support within 28 days of expiry of the ticket. Please note, the outward portion cannot be refunded if the return portion has been used. A GBP 10.00 administration fee will apply and the amount of the refund will take into account any use you have made of the ticket and in some circumstances no refund will be paid.

AMENDING YOUR BOOKING
You can change the time of your outward journey and the date and time of your return journey without changing your tickets. If you wish to change your date of travel or Class of ticket, you will need to buy a new ticket and apply for a refund on your current ticket.

DISCOUNTS
Yes - normal railcard and child discounts available.

BREAK OF JOURNEY
Break of journey is permitted on the return direction of Off-Peak tickets, and is generally permitted on the outward direction unless prohibited for the journey that you are making. If you intend to break your outward journey, please contact us to check if it is permitted.

USAGE VALIDITY PERIOD
5 days outward, 1 month return

PURCHASE WINDOW
Up to start of travel

REFUNDING

EXCHANGING

USER PROFILES
Child, and as for Railcard

INTERCHANGING

DISCOUNTING RULES



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for Transport

Summary



What is NeTEx?



- ▶ **A CEN standard format for the exchange of PT data for Passenger Information**

- ▶ Networks, Timetables, Fares



- ▶ **Based on CEN Transmodel conceptual model for PT data (NeTEx is a subset)**

- ▶ Concepts evolved over 20 years from real PT systems across Europe. (Now on Version 6.0)

- ▶ Now mandated for widespread EU use



- ▶ **Uses a modular XML schema**

- ▶ Model driven design from conceptual model in UML



- ▶ Free to use under a GPL License





Benefits of Transmodel / NeTEx Approach to Fares

Powerful Component based representation

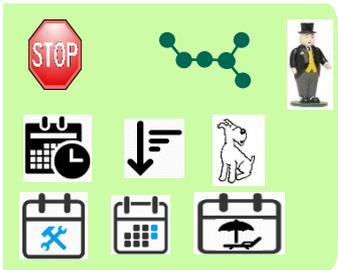
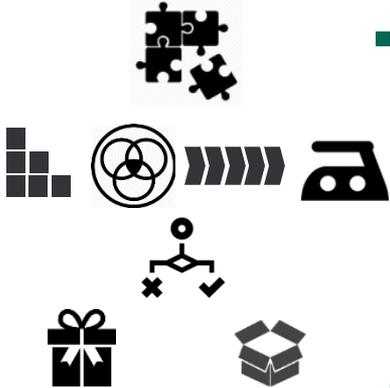
- Allows many different tariff combinations to be described with the same set of atomic components
- Allows complex conditions to be expressed
- Allows necessary packaging of products into different offers
- Gives highly reusable implementations

Joined up conceptual model - Reuses existing Network & Timetable elements

- Network (Stops, tariff zones, modes, operators, etc)
- Timetable elements, services etc
- Temporal conditions and day types, validities

Robust, Flexible, Extensible Technology

- XML allows selective use, validation integrity checking etc
- UML provides tool supported system documentation
- Conceptual model for Account Based Ticketing and future developments





Some Drawbacks to a Component based Approach

- ▶ **Skills Investment needed to understand Concepts & Components**
 - Tariff structures, Access rights
 - Uses of different parameters
 - Product and Sales Offer packaging
- ▶ **Component based semantics require attention to assembly and compounding behaviour**
 - Restrict to simple combinations, single organisations
 - Exchange of data does not guarantee exchange of behaviour!