Post Cost Modelling: Stakeholder Workshop, 11 October 2019

1.1   This document sets out the information presented to postal stakeholders at the Post Cost Modelling stakeholder workshop held at Ofcom's offices on 11 October 2019.

Aims of the workshop

1.2   Over the last year we have been working on a bottom up cost model of Royal Mail's network. We are holding this workshop to provide an update on the progress we have made and to aid your conceptual understanding of it. The workshop will also allow you to provide views on our approach and development of the model in advance of its completion.

1.3   Please note that the model is still in development and will require further work, including peer review. Furthermore, although we expect these models will feed into our more general review of postal regulation (which we have committed to complete by 2022), we do not intend to discuss that general review today.

1.4   A Q&A session will follow the presentation and we will circulate these slides after the workshop.

Agenda

1. Overview
2. The bottom up cost Models (Collections, Processing and Logistics, Delivery).
3. Example outputs
4. Q&A

Overview

Ofcom's approach to postal regulation

1.5   Ofcom has legal duties to further the interests of citizens and consumers and to secure the provision of a universal postal service. In 2017 we conducted a Review of the Regulation of Royal Mail which covered a wide range of areas, including;

a)   Royal Mail's financial sustainability and efficiency;

b)   competition in the parcels and letters sectors;

c)   levels of customer satisfaction, and;

d)   the appropriateness of regulatory conditions.

1.6   Looking forward to the next review in 2022, we will revisit these key areas to ensure regulation keeps pace with market changes.

Looking towards the future review

1.7   In our 2017 Review of Royal Mail Regulation, we said that we would build a bottom-up cost model of Royal Mail's delivery operation to develop our understanding of the costs of delivery. In 2018 we completed the development of a preliminary model of Royal Mail's delivery operation.

1.8   As set out in our 2019/20 Annual Plan, we are now in the process of expanding the modelling to cover all of Royal Mail's operations. This expanded model will assist us with our work for this future review. Earlier this year we contracted consultants, Analysys Mason, to support the project.

Objectives of the work

1.9   We think that the Post Cost Model will be able to provide insight into four key areas:

   a) **Efficiency:** The model will provide an independent, bottom up perspective on RM's costs, the drivers of those costs, and inform our view of Royal Mail's progress in efficiency.

   b) **Meeting the reasonable needs of users:** We will consider the reasonable needs of postal users in the UK. The model will be able to provide insight on the impact of Royal Mail meeting these needs.

   c) **Costs:** The model will give us a range of cost information – from the costs of delivering particular items, how costs should be allocated and the costs of delivering in different areas.

   d) **Competition concerns:** The model will assist our understanding of Royal Mail's costs, supporting any analysis of potential competition concerns.

The Post Cost Model

Overview of the Post Cost Model

1.10   The aim of the post cost model is to estimate the annual operating costs associated with running Royal Mail's Reported Business.

1.11   The Post Cost Model consists of a number of sub-models each covering a different stage of the pipeline (e.g. collections, processing, logistics, delivery).

1.12   We've taken a bottom-up approach to the modelling work. This dimensions a network – specified in terms of man-hours, machine-hours and vehicles – that is sufficient to handle a set of inputted mail volumes for a representative week. This is in contrast to a top-down model where the starting point would be the costs currently incurred by a business. We've also used

a 'scorched node' approach which assumes that some aspects of Royal Mail's current network, such as the number and locations of its delivery offices and mail centres, are fixed. This is in contrast to a 'scorched earth' approach which would aim to dimension an optimal network from the ground up.

1.13   Royal Mail has provided various data for the 2018/19 financial year (e.g. mail volumes, vehicle costs, machine throughputs, staff wage rates, transport plan) which will be inputted into the model. The mail volumes used are consistent across all sub-models. Differences in the average size of different mail types are accounted for using sample data from Royal Mail's 2018/19 Mails Characteristics Survey.

1.14   We have four segments of the model:

   a) Ofcom Collections Model. This models the network from the collection points (12,000 post offices, 115000 post boxes and 76000 businesses) to the Collection hub.

   b) Analysys Mason model of Processing and Transport Logistics. This models the network from the collection hub through the processing and transport functions all the way to the Delivery office.

   c) Ofcom Delivery Model. This models the work inside the Delivery office and Royal Mail's local delivery operation to every drop point in the country.

   d) Ofcom Control Panel and Consolidation model. This brings the outputs from the previous three models together, combined with any additional overheads.

Overview of Collections

1.15   We use the term 'Collections' to refer to the collection of mail from each individual collection point across the country and the moving of the mail to the local collection hub where it is prepared for the next part of the network.

Collections Model

1.16   The aims of the Collections Model:

   a) The collections model builds a bottom-up model of Royal Mail's (RM) collection operation.

   b) The model uses raw data from RM's Collections Management Database (CMD) on volumes and collection points.

1.17   Key outputs from the collections model:

   a) Total visits per collection point are calculated given the current volumes.

   b) Per collection hub, total number of routes required between collection points are calculated, given the locations and volumes of the collection points.

   c) This gives total staff hours and travel distance required to perform collections.

1.18   Key assumptions of the collections model:

a) Collections that Royal Mail performs on delivery ('COLOD') are captured by the delivery model.

How the Collections Model works

1.19   The Collections Model uses two raw data sheets – Royal Mail's Collections Management Database and Actual traffic data by Collection Hub. This data is taken down two paths.

1.20   The first path sees the actual traffic by Collection Hub converted into a traffic by Collection Hub and by day of the week. These figures meet the daily information from the CMD to calculate the traffic by Collection Point and the Visits by Collection Point. This calculation then removes any collection on delivery points by post code sector and communicates these to the delivery model.

1.21   The second path uses the data from the CMD and runs it through an external python script to prepare the geographic data by Collection Hub. This is then inputted with the remaining data from the first path to identify the routes and hours by Collection Hub and day. Following this, the model calculates the annual should-take vs. does-take hours by Collection Hub and the annual routes, hours and cost by Collection Hub.

Overview of processing and logistics

1.22   This segment of the model takes the mail at the Collection Hub and transports it to the relevant Mail Centre (Local Transport). Here, mail is sorted and sent to the relevant transport link to move it to the next location – either a second mail centre or a Regional Distribution Centre (RDC) (We call this National Transport). The RDC is a staging post between some mail centres to ensure a more effective transportation process. From here, the mail is moved to the second mail centre. At the second mail centre the mail is sorted for transport to the relevant delivery office and then moved there (also Local Transport).

Processing and Logistics Cost Model

1.23   The aim of the Processing and Logistics Cost Model:

a) Construct a bottom-up model of Royal Mail's network for processing and transport logistics, where resource requirements can respond to changes in volumes.

1.24   Key outputs of the Processing and Logistics cost model:

a) Resource requirements for an average working week on a hour-by-hour basis.

b) Processing machine and labour man-hour requirements at each mail centre location.

c) Driving miles, driver man-hours and vehicle requirements for both local and national transport.

1.25   Key assumptions:

a) Transportation assumptions are based on raw data from Royal Mail's regional and national transport plans.

How the Processing and Logistics Cost Model works

1.26   This model consists of several models that communicate to product the overall outputs:

a) The Control Model sets the parameters for running the model (central definition and running of scenarios).

b) Volume Model calculates 2018/19 volumes by service and by node (by node we mean Mail Centres, Collection Hubs and Delivery Offices). This model uses Royal Mail volume data warehousing and the Mail Characteristics Survey (MCS). It outputs mail volumes by day/location.

c) Local Transport Model calculates vehicles, driver shifts and mileage for transport between nodes. This model uses Royal Mail local transport plans and data on the locations of all Collection Hubs/Delivery Offices. It outputs driver miles by vehicle size, driver shift hours per week and road vehicle requirements by size.

d) The National Transport Model calculates hour by hour volumes to the Mail Centres, additional return legs where required, required vehicle sizes/driver shifts and space requirements for RDCs. This uses Royal Mail's national transport plans and vehicle capacity assumptions (Yorks). It outputs driver miles and shift hours, vehicle requirements (road, air, rail, sea) and space requirements for distribution centres.

e) The Processing model calculates resource and equipment requirement on an hour by hour basis for Mail Centre functions at each MC and each workstream (e.g. 1st Class letters, 2nd Class parcels etc...). This uses a range of data from Royal Mail including the technical specification of equipment, planning values and national transport plans. It outputs processing labour hours, machine hours by machine type and space requirements for each MC.

f) The Cost Model calculates the costs per mail item on a national-average basis and de-averaged by DO. This uses unit cost information for 2018/19 and average physical mail volume characteristics from the MC. It outputs unit cost per mail item on a national-average basis and de-averaged by DO.

Overview of Delivery

1.27   This segment of the model replicates the sorting functions within the Delivery Office (Indoor Delivery) and the outdoor delivery network (Outdoor Delivery). Indoor delivery covers hours spent preparing mail for outdoor delivery and can be divided into the following main activities:

a) **Reception**: unloading of mail from lorries arriving at a delivery office from its mail centre

b) **Sortation**: sorting of unsorted mail to delivery routes

c) **Preparation**: aggregation of different mail bundles for a delivery route on to a frame with a slot for each delivery point before unloading in to a trolley or van depending on the delivery method used for that route. The frame has spaces for walk-sequenced letters, walk-sorted letters, parcels and door-to-door contracts.

1.28   Outdoor delivery covers hours spent outside the delivery office delivering mail to homes and businesses. This is typically done with a High Capacity Trolley which can carry letters and small parcels or a dedicated van which usually delivers large parcels. Different van sizes are used depending on the geography of the delivery area. Royal Mail currently uses a range of delivery methods:

a) **Shared van (park and loop):** All mail formats. Two Postal Officers drive to the delivery location using a van. They then deliver letters and small parcels by foot on walking 'loops' using the lightweight trolleys. Large parcels delivered using van.

b) **Rural van:** One Postal Officer delivers all mail formats using the van.

c) **Firm van/town van (hybrid firms/residential):** One Postal Officer delivers all mail formats using the van.

Delivery Model

1.29   For outdoor delivery, the model estimates hours and then routes required to deliver typical daily traffic for a postcode sector (c. 10k postcode sectors in the UK) depending on the delivery method used by Royal Mail for most of the delivery points in the postcode sector. This depends on the mix of traffic (letters, large letters, small/medium/large parcels) and various time and capacity constraints (e.g. capacity of a trolley or van, geography of postcode sector, length of a delivery shift). As part of this, we use data from Royal Mail that indicates the average Stem time (travel time for postal officer from DO to loop locations and back to DO), Street time (time walking on the street for the loop), Path time (time spent walking off the street to the letterbox) and Call time (time spent handling over mail).

1.30   For indoor delivery, the model estimates hours required to prepare typical daily traffic for outdoor delivery using Royal Mail's planning values. These planning values are calculated by industrial engineers and give the theoretical time required to perform activities (e.g. minutes per 1000 items); the model can assess the impact of relaxing or tightening any or all of these planning values.

1.31   The delivery model is structured in the following way:

a) Delivery office data, the MCS and postcode sector data is fed into input sheets which identify annual volumes by postcode sector, assumptions, average size of items and delivery methods by postcode sector. These are fed into calculation sheets which work out the daily street, path, call time by postcode sector and daily routes and hours by postcode sector. This also interfaces with the collections model to identify the number of collection on delivery points.

b) Indoor delivery planning values are used to calculate indoor hours by DO and zone. This is combined with the information at a) to calculate annual should-take vs. does-take hours by Delivery office. These can be divided down to Indoor and Outdoor hours gap, annual routes, hours and costs by DO and nationally.

State of development

1.32   We expect to have a complete model ready to feed into the user needs analysis that will be taking place in 2020.

Processing and Logistics

1.33   Analysys Mason are developing the Processing and Logistics Cost Model on behalf of Ofcom. The model is structurally complete. The model is currently being populated and finalised using data for the financial year 2018-19 in co-operation with Ofcom.

Delivery

1.34   We have completed the development of the Delivery Model using 2016/17 data. We are currently updating the Delivery Model using 2018/19 data.

Collections

1.35   We are currently developing the Collections Model.

Control Panel

1.36   This work has recently started, and we expect to complete this in due course.

Example outputs

1.37   We want to give a sense of what outputs the modelling will deliver. For example:

a) We will be able to give a split of frontline cost between indoor and outdoor delivery in both actual costs and % of total costs.

b) We will be able to give a split of hours by outdoor delivery activity (Call time, Path time, Street time and Stem time) in hours and a % of total hours.

c) We will be also be able to measure efficiency. There could be a gap between 'should-take' and 'does-take' hours which may suggest that Royal Mail could take further steps to improve efficiency even within the constraints of its current operation. Our modelling should provide an estimate of 'should-take' hours which can be compared to Royal Mail's estimates.