Independent Pricing and Regulatory Tribunal

Medium-run marginal financial costs (MFC)

Final Report – Information Paper 5

Introduction

The medium-run marginal financial cost (MFC) is a key input for modelling the socially optimal fares in the medium-run (ie, the term of the determination). This cost can be estimated in a number of ways. We used an average incremental cost (AIC) approach, as set out in our methodology paper:

- We estimated the medium-run MFC with reference to an increment of a group of additional Passenger Journeys (PJ) or a group of additional passenger km (pkm).
- We used an 'increment' equal to the current number (2014-15) of passenger journeys and passenger km, and peak journeys and passenger km (a 'top down' average incremental cost approach).
- We produced four outputs for each mode – dollars per passenger journey ($/PJ) and dollars per passenger km ($/pkm) for peak and off-peak periods.

The following slides set out the medium-run MFC we used in making our final decisions and then provide more detail on the assumptions and approach we used to estimate them.

Our final medium-run marginal financial cost estimates

Medium-run MFC used to model final optimal fares, by mode

		Rail	Bus	Ferry	Light-Rail
Peak	$/PJ	5.28	2.15	6.87	3.54
	$/pkm	0.61	0.60	0.93	0.67
Off-peak	$/PJ	1.90	0.47	0.55	0.35
	$/pkm	0.19	0.50	0.93	0.59

- pkm based on straight line distance

- For our final decision, we maintained the approach set out in our draft report, but have updated two of the inputs:
  - We have updated the weighted average cost of capital (WACC) to reflect the IPART's final decision (see Final Information Paper 10 – WACC).
  - For light rail, we have also used a more accurate estimate of the number of peak passenger journeys.

Stakeholder comments on our draft estimates and our response

- One Individual (R Sandell) questioned the medium-run marginal financial costs and the underlying utilisation rates used to calculate optimal fares.   For ferries, he argued that there is significant spare capacity in peak periods. Therefore little increase in investment is required to accommodate substantial growth in peak demand.

- The approach suggested by R Sandell would mean that the marginal cost would be close to zero for all journeys up until a capacity constraint is reached. At this point, there would be a large spike in the marginal cost for an additional passenger as the fleet is expanded to provide additional capacity.

- We consider that an average incremental cost (AIC) approach is preferable as it avoids these large spikes in marginal cost. We have estimated the marginal costs with reference to an increment of a group of additional passenger journeys or a group of additional passenger km. We used an increment equal to the current number of passenger journeys and passenger km, peak journeys and passenger km (a ‘top down’ average incremental cost approach).

- It is our view that as peak demand drives capacity, peak fares should include the incremental capacity costs. As usage costs are incurred in all periods, the incremental usage costs should be reflected in both peak and off-peak fares.

In calculating these estimates, we assumed that in the medium-run:

- Rail track and road capacity are fixed.
- Vehicle fleets and service frequencies can expand or contract in response to changes in demand.
- Non-fleet assets can improve the capacity of public transport services. For example, these may include wharf and station upgrades, additional bus priority measures on existing roads, upgraded and additional bus depots.

We included the following services in our estimates:

- For light rail and ferry, we included all current light rail (Dulwich Hill to Central) and ferry services. (We included the new CBD and south east light rail in our long-run scenario only.)

- For buses, we only included costs and patronage of operating the metropolitan bus contract regions. We excluded the costs of the outer metropolitan bus contract regions, as many of the services in these regions are operated for social inclusion and are characterised by low patronage and higher AIC.

- For rail, we included only costs and patronage of Sydney Trains. We excluded NSW TrainLink Intercity services, as including them would mean that inner city passengers are being asked to subsidise network maintenance and operation in outer areas of the network.

Our approach involved three main steps:

1. Putting the actual cost data for the included services in each mode for 2014-15 into 17 high-level cost categories, and determining the efficient level of these costs by applying The Centre for International Economics (CIE)'s recommended efficiency savings.
2. Allocating each cost category between capacity and usage, and between passenger journeys (PJ) and passenger km (pkm)
3. Dividing each of these cost allocations by PJ or pkm in the relevant time period to give four outputs:
   - Peak $/PJ
   - Peak $/pkm
   - Off-peak $/PJ
   - Off-peak $/pkm

Putting actual costs for 2014-15 into 17 high-level categories

TfNSW provided us with actual cost data for each mode in 2014-15. We used:

- For rail, Sydney Trains costs excluding any non-passenger services (freight).
- For bus and ferry, the financial costs reported under the bus and ferry contracts with TfNSW. We consider this data is more suited to our purpose than contract payments, as it provides a better breakdown of costs by activity for allocating costs to capacity and usage and PJ and pkm.
- For light rail, the costs estimated by the public sector comparator (PSC) – a tool developed by TfNSW specifically for estimating the cost of light rail services.

We also allocated a proportion of TfNSW shared costs (including policy and planning costs) to each mode consistent with TfNSW allocations (based on patronage shares).

The cost data was not in a consistent form across modes; we developed a set of 17 general cost categories for public transport, and sorted these actual costs into the following categories:

- Where this data was not sufficiently disaggregated, we made a best estimate of the relevant category (eg, rail operating data was originally broken into 5 high-level categories)
- We substituted an annuity calculation for fleet capital costs included in reported operating expenditure (eg, bus lease payments).

We estimated fleet costs as the value of an annuity of the replacement cost of the fleet

Mode	Fleet replacement cost ($m)	Economic life (years)	Discount rate	Annual annuitised fleet cost ($m)
Rail	$8,701.5	35	5.5%	$565.4
Bus	$361.8	18	5.3%	$31.7
Ferry	$259.6	35	5.8%	$17.5
Light Rail	$53.6	30	5.3%	$3.6

- We calculated fleet replacement cost by determining an average vehicle price and multiplying by the number of vehicles
- We assumed economic life based on data reported by TfNSW for this review, except for ferries. For that mode, we made a judgement based on a range of depreciable asset lives reported by Sydney Ferries in 2012.
- We used a post-tax real WACC consistent with our WACC estimates for public transport services as the discount rate (see Final Report - Information Paper 10 - WACC).

Determining the efficient level of these 17 costs

In line with our general view that customers should not pay for inefficiencies, we adjusted each of the 17 cost categories for each mode to reflect the CIE's recommended operating cost efficiency savings in 2014-15.

These savings varied across the operating cost categories but on average these adjustments were:

- -30% for rail
- -20% of bus
- -10% for ferries

We are unable to publically release our determined efficient incremental cost values as they reflect commercial in confidence information.

Allocating efficient cost categories to capacity or usage, and PJ or pkm

We defined capacity and usage costs as follows:

- Capacity costs are the costs required to meet the largest peak demand. They include:
  - asset ownership costs, and
  - other costs that do not vary with patronage, such as maintenance of ticketing system equipment.
- Usage costs are the costs that, once capacity has been established, vary either with the total number of passengers served or the number of passenger km provided. They consist largely of operating costs, such as:
  - vehicle maintenance costs
  - fuel costs, and
  - crewing costs.

Capacity costs should be reflected in peak fares, and usage costs in both peak and off-peak fares

- Peak demand drives capacity, so peak fares should include the incremental capacity costs.
- Usage costs are incurred in all periods, so the incremental usage costs should be reflected in both peak and off-peak fares.
- Incremental costs are equal to:

  b in the off-peak period

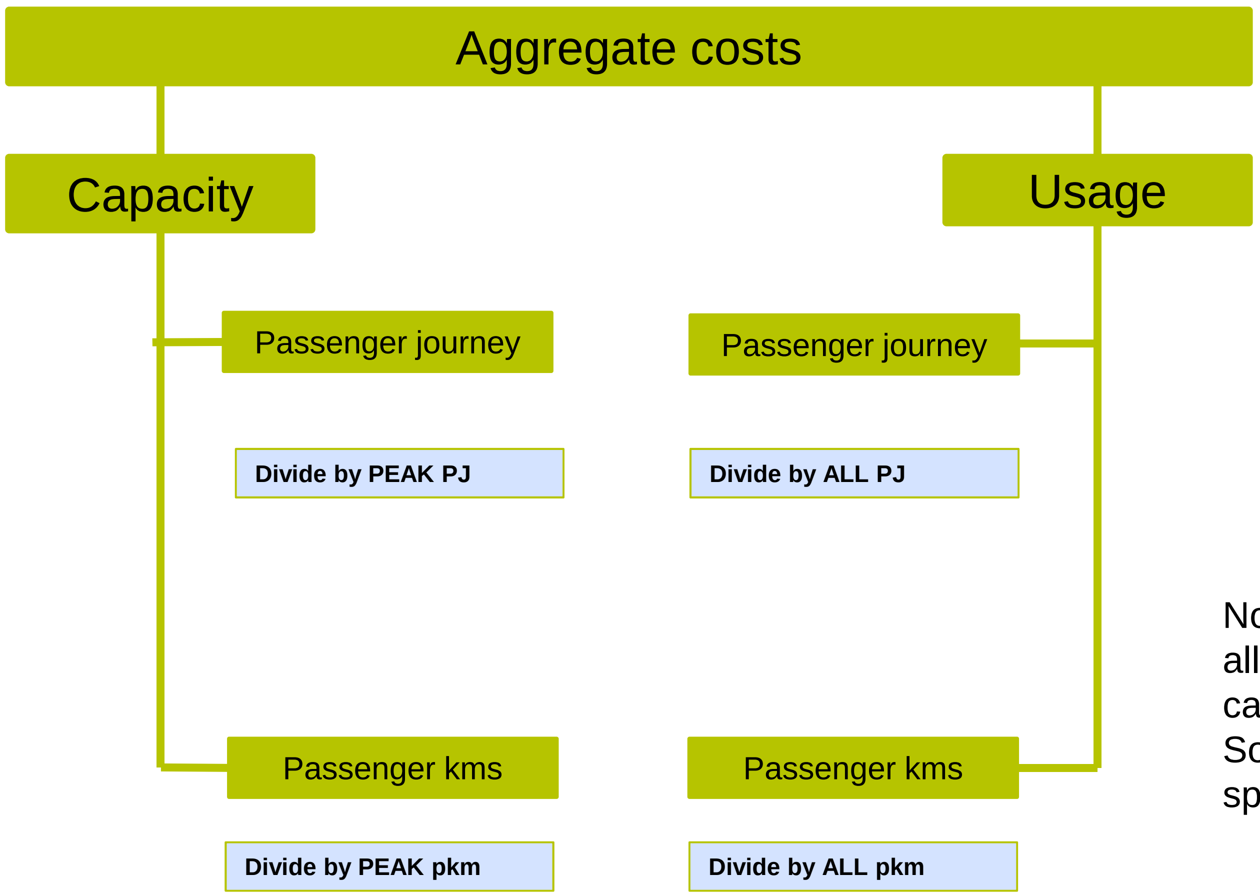
  B + b in the peak period

  where:

  b is the efficient incremental financial usage costs per journey

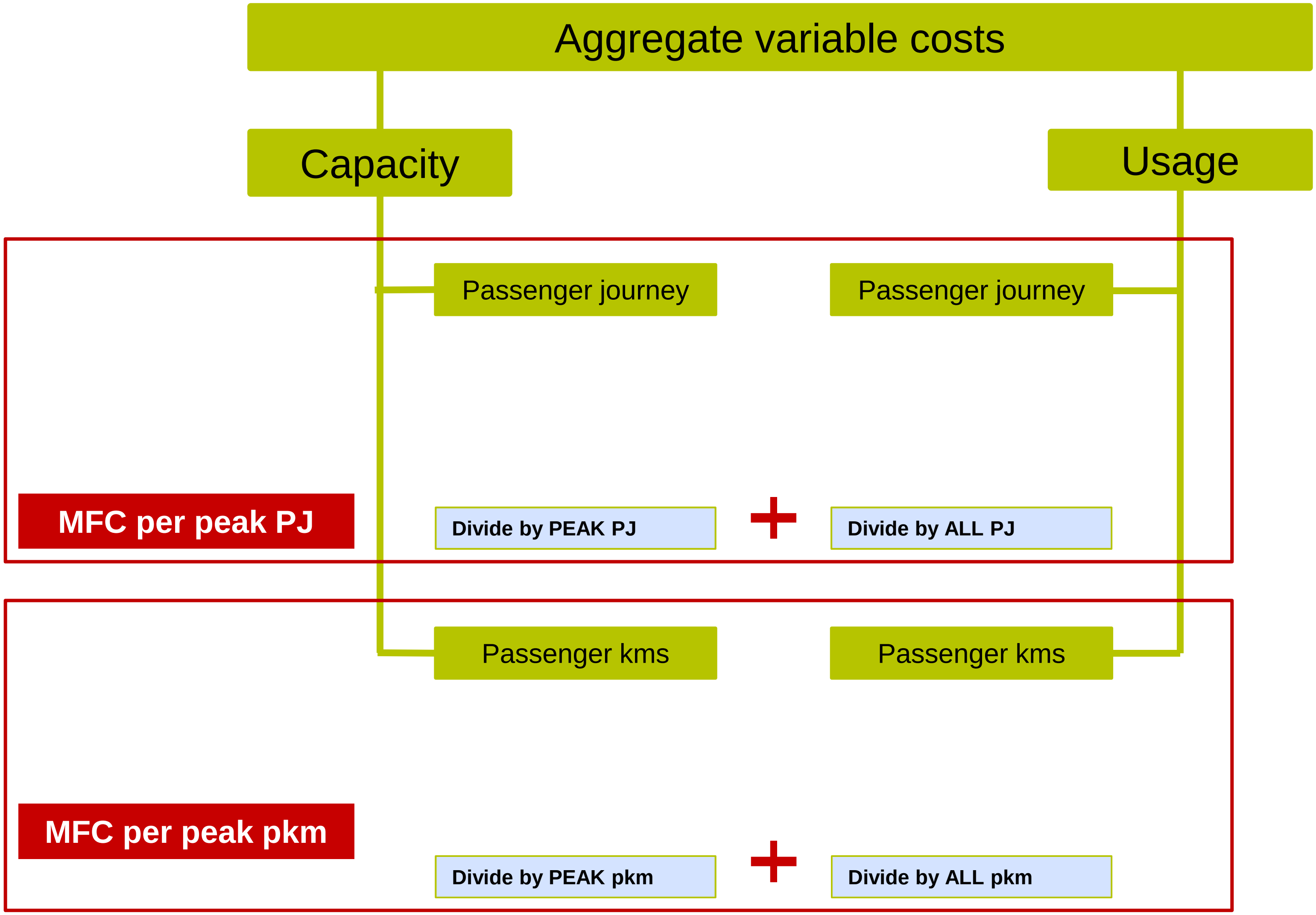
  B is the efficient incremental financial capacity costs per peak journey

Our approach for allocating costs

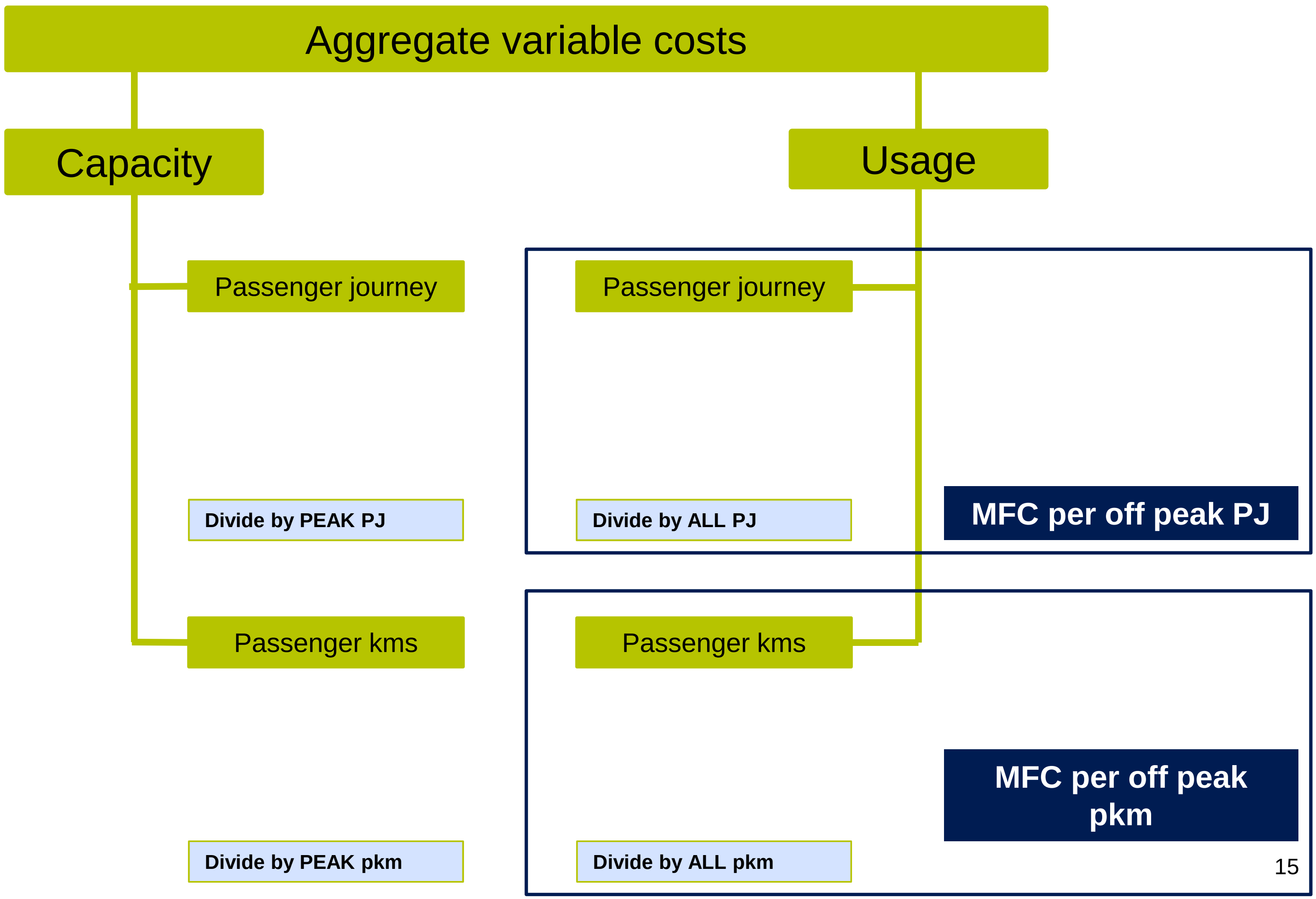


Not all costs are allocated 100% capacity or usage. Some costs are split between them

Peak marginal financial costs



Off peak marginal financial costs



Allocating cost categories to capacity or usage and to PJ or pkm

In most cost categories, the percentage we allocated to capacity or usage and PJ or pkm was the same for all modes. One exception was the annuitised fleet capital costs category:

- For most modes, we allocated 100% to capacity and 100% of these costs to pkm, as fleet size is driven by peak pkm demand.
- For ferry, we allocated 60% to capacity, as patronage data indicates that 60% of the ferry fleet suffices to satisfy demand in the weekday road peak.
- For light rail and ferry, we allocated 100% to PJ as this allocation better reflects the light rail network and fleet costs are driven more by PJ than pkm.

For other vehicle operating costs, we allocated 100% to usage and to pkm.

For network and customer interface costs, we allocated 100% to passenger journeys (PJ).

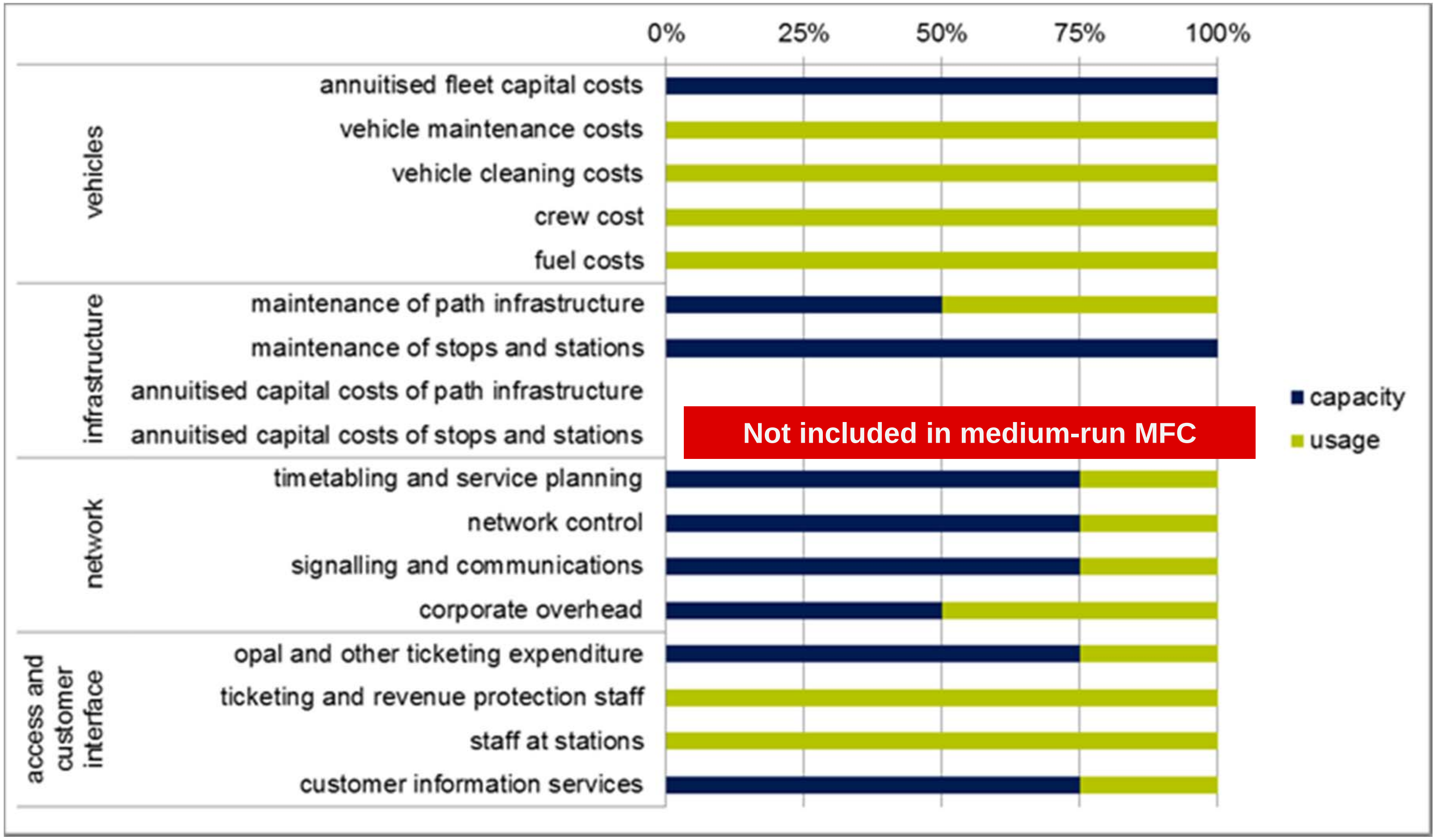
For network and customer interface costs, it is less clear, so we allocated 75% of these costs to capacity, except for:

- Ticketing staff, and staff at stations (100% to usage)
- Corporate overhead (50% to capacity).

For maintenance of path infrastructure (eg, rail tracks), we allocated 50% capacity and 50% PJ.

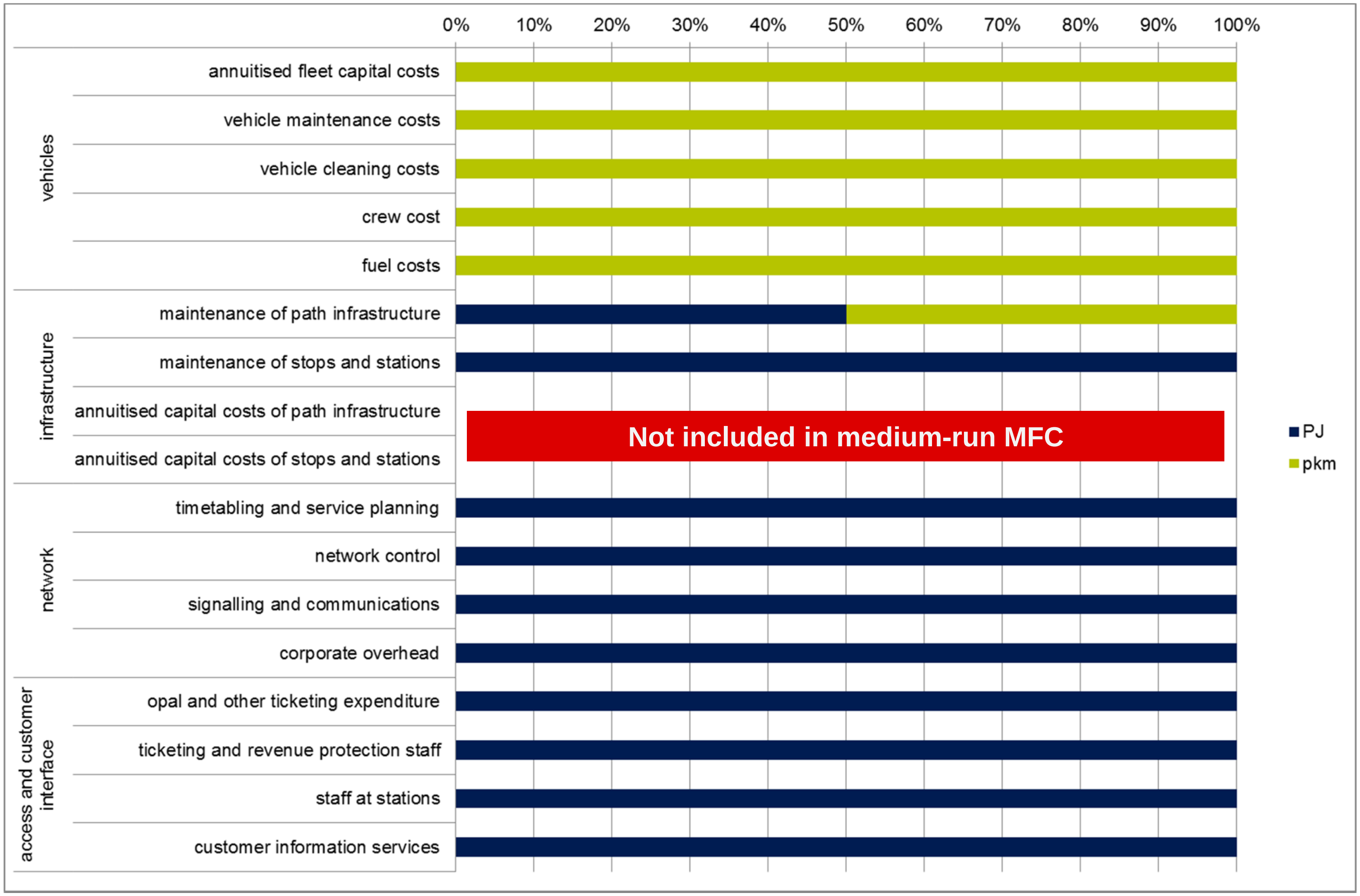
For maintenance of stops and stations, we allocated 100% capacity and 100% PJ.

Our cost allocations between capacity and usage



Note for ferry, we allocated 60% to capacity

Our cost allocations between PJ and pkm



Our cost allocations by mode