

6 JUNE 2019

QA OF TRANSPORT FOR NSW'S 2019-20 PRICING PROPOSAL FOR COMPLIANCE WITH IPART DETERMINATION

THE INDEPENDENT PRICING AND REGULATORY
TRIBUNAL OF NSW (IPART)

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1 INTRODUCTION

On 20 May 2016, the Independent Pricing and Regulatory Tribunal of NSW (IPART) determined the maximum fares to apply from July 2016 to June 2019 for all Opal Sydney services in Sydney and surrounds (covering rail, light rail, buses and ferries). IPART's Determination was issued in the form of a maximum weighted average price change. On average, Adult Opal fares can increase by a maximum of 13% (including inflation) over the 3 years to June 2019.

Frontier Economics was engaged by IPART to undertake a Quality Assurance (QA) check of TfNSW's 2019-20 pricing proposal and provide assurance that the data and calculations used can be extracted and replicated to give average fares that comply with IPART's *Transport – maximum fares for Opal services*.

In its 2019-20 pricing proposal TfNSW has proposed to:

- increase all Opal fares and daily caps by CPI (1.9 per cent) from 24 June 2019; and
- decrease all weekly Opal caps.

We have reviewed the logic, calculations and assumptions underlying the TfNSW 2019-20 pricing proposal and are satisfied that the Average Adult Fare of \$2.61 for 2019-20 has been calculated appropriately.

- Following our on-site visit to TfNSW's offices on 31 May 2019, we can provide IPART with assurance that the data provided by TfNSW can be traced back to source data or information on TfNSW's database using SQL queries.
- Our replication of the proposed Average Adult Fare of \$2.61 is provided in Section 2. On the basis of our findings, we can provide IPART with the following assurances.
 - The 2019-20 Average Adult Fare of \$2.61 can be replicated using source data provided by TfNSW¹ on the trips on Opal Services made during the seven week representative period in 2018-19 under an Opal Card and under a Ticket. The period chosen was 11 March to 28 April 2019, comprising both normal travel weeks and weeks impacted by public holidays.
 - The assumptions that are made by TfNSW in calculating the proposed Trip Distribution for 2019-20 from the representative period in 2018-19 are documented and correctly used.
 - Any assumptions in calculating the proposed Trip Distribution for 2019-20 from the representative period in 2018-19 are correctly used to calculate weights in the proposed Trip Distribution and that this calculation can be replicated.
 - The Average Adult Fare is correctly calculated using this Trip Distribution and that this calculation can be replicated.
- The seven week representative period from 11 March to 28 April 2019 that TfNSW proposes to use as the starting point for the 2019-20 Trip Distribution is reasonable. Our sensitivity analysis of alternative representative periods is outlined in Section 3. On the basis of our findings, we can provide IPART with assurance that the Average Adult Fare would not be significantly different under the following alternative sample periods, all of which have a mix of holiday and normal weeks.
 - Alternative period 1: 26 November 2018 to 10 February 2019 (including Christmas/New year's and Australia day)

¹ In the Excel file entitled 'frontier support calcs 20190531'.

-
- Alternative period 2: 27 August to 14 October 2018 (including Labour day)
 - Alternative period 3: 23 April to 24 June 2018 (including Anzac day and the Queen's birthday)
 - Alternative period 4 (**representative period chosen by TfNSW**): 11 March to 28 April 2019 (including Good Friday/Easter Monday and Anzac day)
 - We have conducted high-level sensitivity analysis of the potential impact of Sydney's newly opened Metro North West line on the Average Adult Opal fare. We found the new rail line will have an immaterial impact on the Average Adult Opal fare. This is shown in Section 4.

On this basis we can provide assurance that the proposed increase in the Average Adult Opal fare does not exceed a 13% increase (from 2015-16) including inflation and that the TfNSW Pricing Proposal complies with IPART's Determination: *Transport – maximum fares for Opal services*.

2 REPLICATION OF TFNSW'S AVERAGE ADULT FARES

Frontier Economics has been able to replicate TfNSW's proposed Average Adult Fare of \$2.61 for 2019-20 as set out in **Table 1**. These figures have been calculated using source data provided by TfNSW on the trips on Opal Services made during the seven week representative period in 2018-19 using an Opal Card or using a Ticket. The period chosen was 11 March 2019 to 28 April 2019, comprising both normal travel weeks and weeks impacted by public holidays. **Table 1** below replicates the figures in Table 2 of TfNSW's pricing proposal.

Table 1: Average Adult Fare by product

Product group	2018-19 OBSERVED VALUES		2019-20 PROJECTED VALUES	
	Trip weighting	Average adult fare	Trip weighting	Average adult fare
Opal card	98.9%	\$2.56	98.9%	\$2.58
Ticket	1.1%	\$4.55	1.1%	\$4.68
TOTAL	100%	\$2.58	100%	\$2.61

Source: Frontier Economics calculations using data provided by TfNSW

To calculate the Average Adult Fare set out in **Table 1** above, a 'Trip Distribution' is required. The Trip Distribution reflects the number of trips taken for an Adult Fare for each price band, as a proportion of total Trips taken for that period. Frontier Economics has been able to replicate TfNSW's observed Trip Distribution for 2018-19 and proposed Opal card Trip Distribution for 2019-20 using the source data.

- The **observed** 2018-19 Trip Distributions and fares for **Opal reloadable card trips** is presented in **Table 2** below. This table replicates Table 3 of TfNSW's pricing proposal.
- The **projected** 2019-20 Trip Distributions and fares for **Opal reloadable card trips** is presented in **Table 3** below. This table replicates Table 4 of TfNSW's pricing proposal.
- The **observed** 2018-19 Trip Distributions and fares for **Single Trip Tickets** is presented in **Table 4** below. This table replicates Table 5 of TfNSW's pricing proposal.
- The **projected** 2019-20 Trip Distributions and fares for **Single Trip Tickets** is presented in **Table 5** below. This table replicates Table 6 of TfNSW's pricing proposal.

Table 2: Frontier Economics' replication of TfNSW's projected Opal card Trip Distribution and Average Adult fare for 2018-19

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	8%	8%	\$0.00	7%	6%	\$0.00	7%	6%	\$0.00
\$2.00	19%	22%	\$0.94	22%	26%	\$0.99	21%	25%	\$0.98
\$3.00	23%	25%	\$2.15	22%	25%	\$2.14	23%	25%	\$2.14
\$4.00	27%	29%	\$3.13	26%	26%	\$3.15	26%	26%	\$3.14
\$5.00	12%	10%	\$4.16	12%	10%	\$4.15	12%	10%	\$4.15
\$7.00	9%	7%	\$5.17	9%	6%	\$5.13	9%	6%	\$5.14
Over \$7.00	1%	1%	\$7.32	1%	1%	\$7.44	1%	1%	\$7.42
ALL	100%	100%	\$2.55	100%	100%	\$2.56	100%	100%	\$2.56

Source: Frontier Economics calculations using data provided by TfNSW

Table 3: Frontier Economics' replication of TfNSW's projected Opal card Trip Distribution and Average Adult fare for 2019-20

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	9%	9%	–	8%	9%	–	8%	9%	–
\$2.00	19%	18%	\$0.97	21%	22%	\$1.02	21%	21%	\$1.01
\$3.00	23%	26%	\$2.20	22%	26%	\$2.19	22%	26%	\$2.19
\$4.00	27%	28%	\$3.19	26%	26%	\$3.20	26%	26%	\$3.20
\$5.00	12%	10%	\$4.23	12%	10%	\$4.23	12%	10%	\$4.23
\$7.00	9%	7%	\$5.27	9%	6%	\$5.22	9%	6%	\$5.23
Over \$7.00	1%	1%	\$7.46	1%	1%	\$7.58	1%	1%	\$7.56
ALL	100%	100%	\$2.60	100%	100%	\$2.58	100%	100%	\$2.58

Source: Frontier Economics calculations using data provided by TfNSW

Table 4: Frontier Economics' replication of TfNSW's observed Single Trip Ticket Distribution and Average Adult fare for 2018-19

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	–	–	–	–	–	–	–	–	–
\$2.00	–	–	–	–	–	–	–	–	–
\$3.00	21%	21%	\$2.55	23%	25%	\$2.55	23%	24%	\$2.55
\$4.00	–	–	–	–	–	–	–	–	–
\$5.00	37%	35%	\$4.00	41%	40%	\$4.00	40%	39%	\$4.00
\$7.00	22%	23%	\$5.22	21%	22%	\$5.20	21%	22%	\$5.21
Over \$7.00	20%	20%	\$7.83	15%	14%	\$7.90	16%	16%	\$7.88
ALL	100%	100%	\$4.74	100%	100%	\$4.50	100%	100%	\$4.55

Source: Frontier Economics calculations using data provided by TfNSW

Table 5: Frontier Economics' replication of TfNSW's observed Single Trip Ticket Distribution and Average Adult fare for 2019-20

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	–	–	–	–	–	–	–	–	–
\$2.00	–	–	–	–	–	–	–	–	–
\$3.00	21%	21%	\$2.64	23%	25%	\$2.64	23%	24%	\$2.64
\$4.00	–	–	–	–	–	–	–	–	–
\$5.00	37%	35%	\$4.12	41%	40%	\$4.12	40%	39%	\$4.12
\$7.00	22%	23%	\$5.40	21%	22%	\$5.38	21%	22%	\$5.39
Over \$7.00	20%	20%	\$8.02	15%	14%	\$8.08	16%	16%	\$8.07
ALL	100%	100%	\$4.88	100%	100%	\$4.64	100%	100%	\$4.68

Source: Frontier Economics calculations using data provided by TfNSW

3 TESTING WHETHER THE 2018-19 SAMPLE PERIOD IS REASONABLE

TfNSW propose to use the seven week representative period from 11 March to 28 April 2019 as the starting point for the 2019-20 Trip Distribution. In this Section we outline sensitivity analysis of alternative representative periods. In order to facilitate this sensitivity analysis, we have been provided with a total of 30 weeks of Opal reloadable trip and Ticket data ranging from 23 April 2018 to 28 April 2019.

In **Figure 1**, **Figure 2**, **Figure 3**, and **Figure 4** we show how Trip Distributions vary across the different weeks for Opal reloadable (Adult), Opal reloadable (Concession), Single Trip Tickets (Adult) and Single Trip Tickets (Concession) trips, respectively. Holiday weeks are marked as 'H' in the X-axis of these charts. In **Table 6** through **Table 11**, we show how Trip Distribution and Average Adult Fares would differ under the following alternative sample periods, all of which have a mix of holiday and normal weeks.

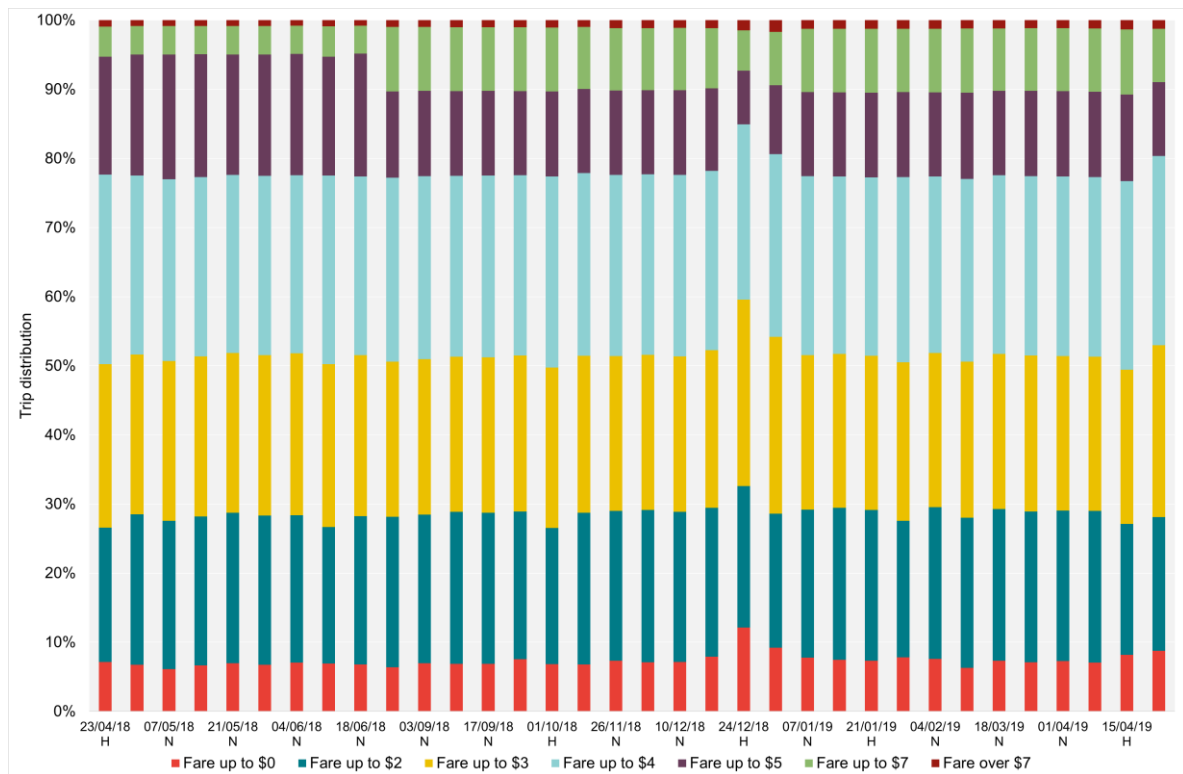
- Alternative period 1: 26 November 2018 to 10 February 2019 (including Christmas/New year's and Australia day)
- Alternative period 2: 27 August to 14 October 2018 (including Labour day)
- Alternative period 3: 23 April to 24 June 2018 (including Anzac day and the Queen's birthday)²
- Alternative period 4 (**representative period chosen by TfNSW**): 11 March to 28 April 2019 (including Good Friday/Easter Monday and Anzac day)

One point to note with respect to the data is that the TfNSW changed their treatment of contactless payment, from a data perspective, during the period. Based on information received from TfNSW, contactless payment was priced on a Single Trip equivalent basis through to 25 November 2018, after which it changed to a pricing structure more similar to Opal reloadable. Given this, TfNSW treated contactless payment as being a Single Trip up to 25 November 2018 and as being an Opal reloadable after this point. By means of context, Single Trips comprise 1% of all travel while contactless payment comprises around 1.5%. In light of this change in treatment, Alternative period 1 is the best direct comparator to the representative period chosen by TfNSW while Alternative periods 2 and 3 are still considered valid for comparison purposes.

On the basis of our analysis, we can provide assurance that the Trip Distribution and the Average Adult Fare would not be significantly different if an alternative sample period was used. The seven week representative period from 11 March to 28 April 2019 that TfNSW proposes to use as the starting point for the 2019-20 Trip Distribution is reasonable.

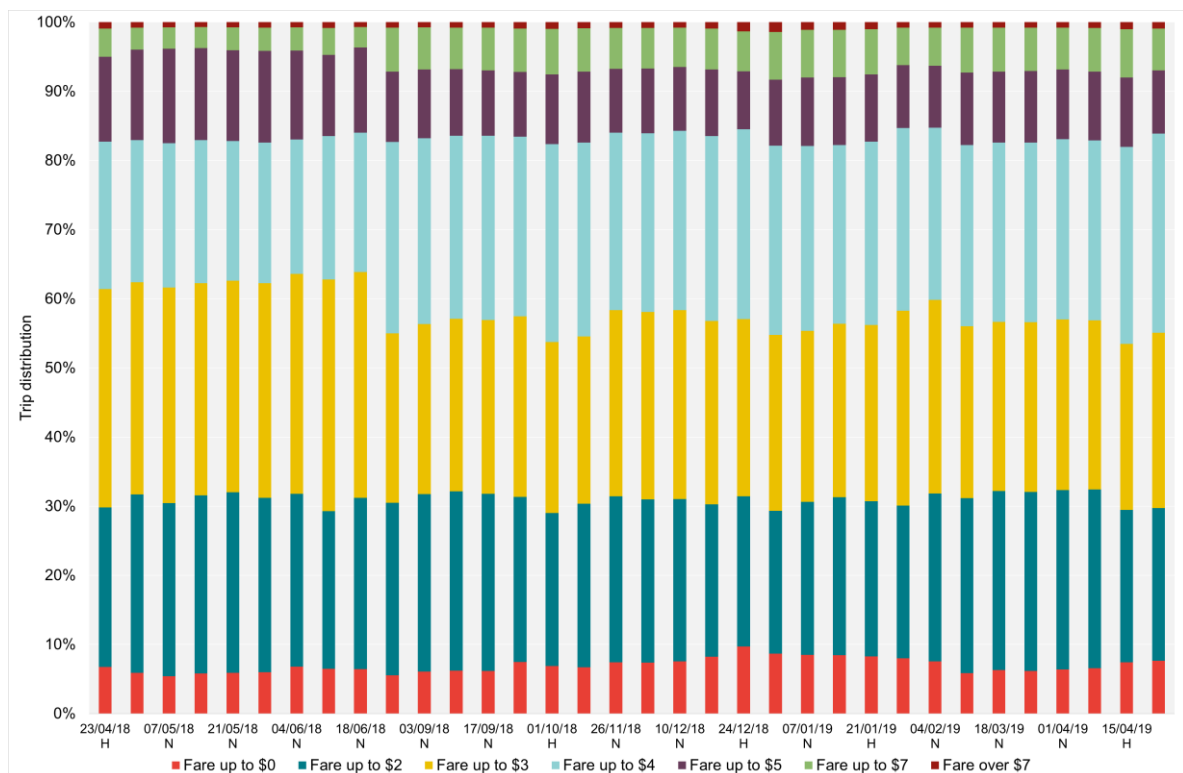
² Note - Alternative Period 3 is before the 2018-19 fare increase, so in order to compare this period to the representative period chosen by TfNSW we must use the 2018-19 fares. Given that we only had access to aggregated weekly data, we approximated this by increasing the average adult fare calculated over that period by the increase in fares seen between the 2017-18 and 2018-19 fare prices of 2.2 per cent. As daily and weekly caps were also increased by the same amount (except the Senior/Pensioner Gold Opal daily cap), we think this is an appropriate transformation with the data available.

Figure 1: Trip distribution – Adult opal reloadable



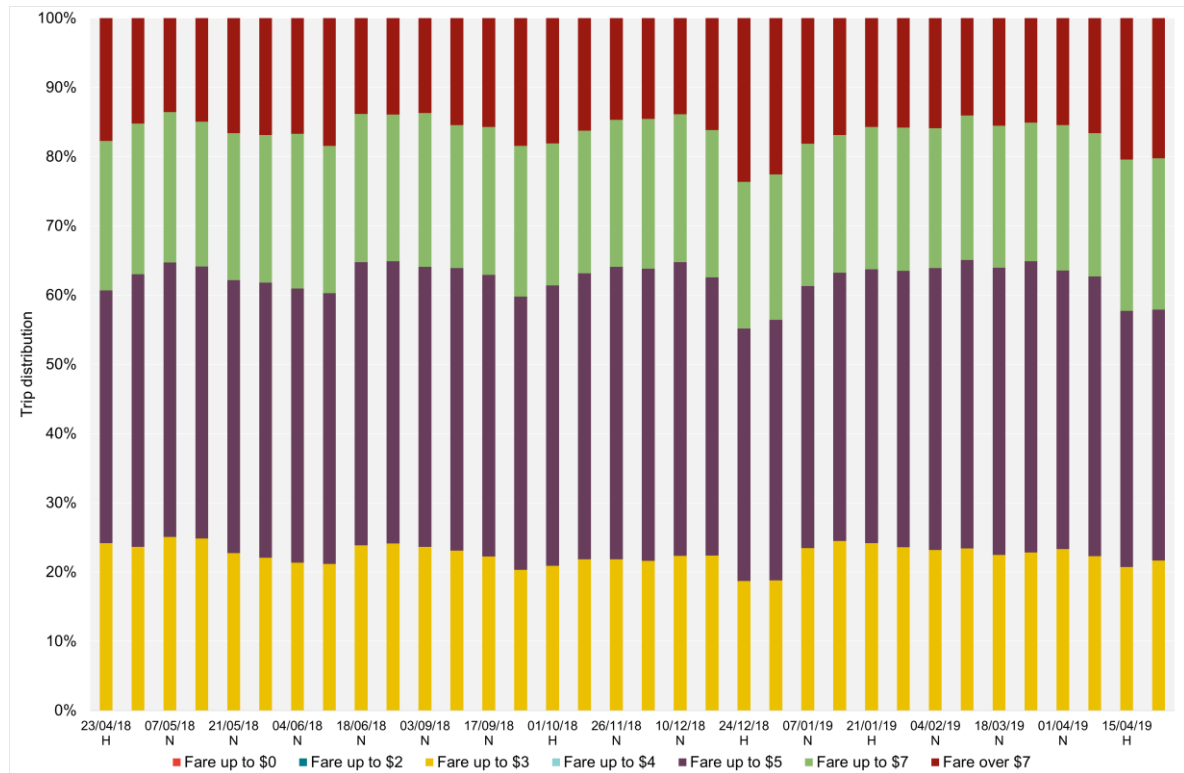
Source: Frontier Economics' analysis of data provided by TfNSW

Figure 2: Trip distribution – Concession opal reloadable



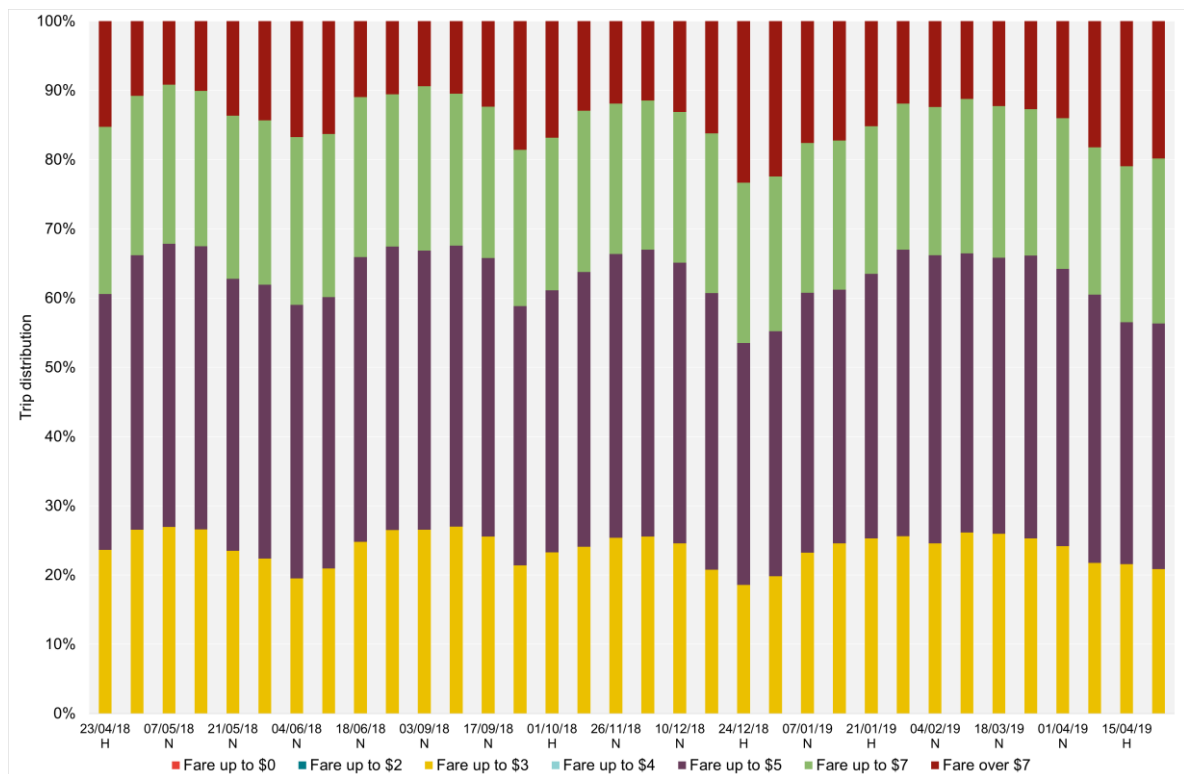
Source: Frontier Economics' analysis of data provided by TfNSW

Figure 3: Trip distribution – Adult single trip ticket



Source: Frontier Economics' analysis of data provided by TfNSW

Figure 4: Trip distribution – Concession single trip ticket



Source: Frontier Economics' analysis of data provided by TfNSW

Table 6: Difference between Alternative period 1 (26 November 2018 to 10 Feb 2019) and TfNSW's proposed representative period (11 March to 28 April 2019) – Opal reloadable

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	1%	1%	\$0.00	0%	2%	\$0.00	1%	2%	\$0.00
\$2.00	2%	0%	\$0.00	0%	-3%	-\$0.01	0%	-2%	-\$0.01
\$3.00	1%	1%	\$0.00	0%	2%	\$0.01	0%	2%	\$0.01
\$4.00	-1%	-2%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$5.00	-1%	0%	\$0.00	0%	-1%	\$0.00	0%	-1%	\$0.00
\$7.00	-1%	0%	\$0.03	0%	0%	\$0.01	0%	0%	\$0.01
Over \$7.00	0%	0%	-\$0.08	0%	0%	-\$0.04	0%	0%	-\$0.05
ALL	0%	0%	-\$0.08	0%	0%	-\$0.01	0%	0%	-\$0.02

Source: Frontier Economics' analysis of data provided by TfNSW

Table 7: Difference between Alternative period 2 (27 August to 14 October 2018) and TfNSW's proposed representative period (11 March to 28 April 2019) – Opal reloadable

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	-2%	-1%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$2.00	1%	0%	\$0.01	0%	-1%	\$0.01	0%	-1%	\$0.01
\$3.00	0%	0%	-\$0.01	0%	0%	\$0.00	0%	0%	\$0.00
\$4.00	0%	0%	\$0.00	0%	1%	-\$0.01	0%	1%	-\$0.01
\$5.00	1%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$7.00	1%	0%	-\$0.02	0%	0%	-\$0.01	0%	0%	-\$0.01
Over \$7.00	0%	0%	\$0.00	0%	0%	-\$0.03	0%	0%	-\$0.02
ALL	0%	0%	\$0.04	0%	0%	\$0.00	0%	0%	\$0.01

Source: Frontier Economics' analysis of data provided by TfNSW

Table 8: Difference between Alternative period 3 (23 April to 24 June 2018) and TfNSW's proposed representative period (11 March to 28 April 2019) – Opal reloadable

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	-1%	-1%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$2.00	0%	1%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$3.00	0%	8%	\$0.03	1%	7%	\$0.04	1%	7%	\$0.04
\$4.00	0%	-8%	\$0.02	0%	-6%	\$0.01	0%	-6%	\$0.02
\$5.00	5%	2%	\$0.13	5%	3%	\$0.13	5%	3%	\$0.13
\$7.00	-4%	-3%	\$0.62	-5%	-3%	\$0.72	-5%	-3%	\$0.71
Over \$7.00	0%	0%	\$0.15	0%	0%	\$0.15	0%	0%	\$0.15
ALL	0%	0%	\$0.04	0%	0%	\$0.01	0%	0%	\$0.01

Source: Frontier Economics' analysis of data provided by TfNSW

Table 9: Difference between Alternative period 1 (26 November 2018 to 10 Feb 2019) and TfNSW's proposed representative period (11 March to 28 April 2019) – Single trip

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$2.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$3.00	-1%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$4.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$5.00	1%	1%	\$0.00	-1%	0%	\$0.00	0%	0%	\$0.00
\$7.00	-1%	-1%	\$0.00	0%	0%	\$0.01	0%	0%	\$0.01
Over \$7.00	1%	0%	\$0.06	0%	1%	\$0.01	0%	0%	\$0.02
ALL	0%	0%	\$0.02	0%	0%	\$0.02	0%	0%	\$0.02

Source: Frontier Economics' analysis of data provided by TfNSW

Table 10: Difference between Alternative period 2 (27 August to 14 October 2018) and TfNSW's proposed representative period (11 March to 28 April 2019) – Single trip

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$2.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$3.00	0%	2%	\$0.00	0%	0%	\$0.00	0%	1%	\$0.00
\$4.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$5.00	4%	3%	\$0.00	-1%	0%	\$0.00	0%	1%	\$0.00
\$7.00	-1%	-1%	\$0.00	1%	1%	\$0.01	0%	0%	\$0.01
Over \$7.00	-2%	-4%	\$0.02	0%	-1%	-\$0.06	0%	-2%	-\$0.04
ALL	0%	0%	-\$0.12	0%	0%	\$0.01	0%	0%	-\$0.02

Source: Frontier Economics' analysis of data provided by TfNSW

Table 11: Difference between Alternative period 3 (23 April to 24 June 2018) and TfNSW's proposed representative period (11 March to 28 April 2019) – Single trip

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$2.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$3.00	2%	1%	\$0.06	0%	0%	\$0.06	1%	0%	\$0.06
\$4.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$5.00	1%	3%	\$0.09	-2%	0%	\$0.09	-1%	1%	\$0.09
\$7.00	0%	1%	\$0.12	1%	2%	\$0.14	1%	1%	\$0.13
Over \$7.00	-2%	-5%	\$0.13	0%	-2%	\$0.06	0%	-3%	\$0.08
ALL	0%	0%	(\$0.04)	0%	0%	\$0.09	0%	0%	\$0.06

Source: Frontier Economics' analysis of data provided by TfNSW

4 SENSITIVITY ANALYSIS OF THE OPENING OF THE NORTH WEST METRO

TfNSW's pricing proposal is based on the assumption that the opening of the Sydney Metro North West line will not materially impact Trip Distribution in 2019-20. This new 36 km rail line, running between Tallawong Station and Chatswood Station, was opened in May 2019 and includes 8 new stations and 5 upgraded stations.

There were reports that there were 500,000 trips³ made on the Sydney Metro North West in the first week, and we have developed three scenarios to capture the uncertainty around the impact of future patronage on the 2019-20 Trip Distribution and Average Adult Fare.

In undertaking this sensitivity analysis we have assumed:

- that this patronage represents additional trips,
- these trips are spread evenly over the Train Fare Bands 1 to 4—capturing both the minimum and maximum distance and fares on the Sydney Metro North West,
- all trips being charged the adult peak time fare, without accounting for the weekly cap of \$50, the Opal Transfer Discount of transferring between modes of transport and the extent to which Sydney Metro North West trips substitute for existing public transport trips.

For these reasons, the sensitivity analysis is likely to overestimate the potential impact on the 2019-20 Trip Distribution and Average Adult Fare.

However **Table 12**, **Table 13** and **Table 14** shows that.

- If the number of additional trips per week is 200,000:
 - the projected Average Adult Fare for Opal trips would increase by \$0.04, and
 - the proportion of trips in the \$5 to \$7 price band would increase by 1%, and
 - the average fare in the \$5 to \$7 price band would increase by \$0.07
- If the number of additional trips per week is 400,000:
 - the projected Average Adult Fare for Opal trips would increase by \$0.08, and
 - the proportion of trips in the \$5 to \$7 price band would increase by 2%, and
 - the average fare in the \$5 to \$7 price band would increase by \$0.13
- If the number of additional trips per week is 600,000:
 - the projected Average Adult Fare for Opal trips would increase by \$0.12, and
 - the proportion of trips in the \$5 to \$7 price band would increase by 2%, and
 - the average fare in the \$5 to \$7 price band would increase by \$0.18

³ *The Sydney Morning Herald*, "Glitches fail to deter commuters as 546,000 people board metro trains", 2 June 2019

As Opal trips comprise almost 99% of total trips, this increase of \$0.12 in the most extreme case impacts on the overall Average Adult Fare, increasing it to \$2.72. This is an increase of 9.3% on the 2015-16 Average Adult Fare, still below the 13% maximum permitted increase for Adult Fares from 2015-16 to 2018-19 of 13%, as set out in IPART's Determination.

We also calculated how many additional trips on the Sydney Metro North West would need to be taken under the previous assumptions for the Average Adult Fare to increase by the 13% on July 2016 prices set out in the determination. This number came out to be more than 1.1 million trips per week, based on the very broad assumptions explained previously.

Note that the purpose of our analysis in this section is to test the illustrative impact of the opening of the Sydney Metro North West on the 2019-20 Trip Distribution and Average Adult Fare. In order to do so, we simply add a number of trips to their respective fare bands. The results in **Table 12**, **Table 13** and **Table 14** therefore are likely to overstate the impacts on 2019-20 Trip Distribution and Average Adult Fare.

Due to the relatively small change in the expected 2019-20 Trip Distribution from the Sydney Metro North West and the fact that this sensitivity analysis is likely to overstate the impacts on the 2019-20 Trip Distribution and Average Adult Fare, TfNSW's proposed 2019-20 Trip Distribution is reasonable.

Table 12: Difference between Frontier Economics' sensitivity analysis of Sydney Metro North West trips on the projected 2019-20 Opal Trip Distribution – 200,000 additional trips

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$2.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$3.00	-1%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$4.00	0%	0%	\$0.01	0%	0%	\$0.01	0%	0%	\$0.01
\$5.00	0%	0%	\$0.01	0%	0%	\$0.01	0%	0%	\$0.01
\$7.00	1%	0%	\$0.08	1%	0%	\$0.07	1%	0%	\$0.07
Over \$7.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
ALL	0%	0%	\$0.05	0%	0%	\$0.04	0%	0%	\$0.04

Source: Frontier Economics' analysis of data provided by TfNSW

Table 13: Difference between Frontier Economics' sensitivity analysis of Sydney Metro North West trips on the projected 2019-20 Opal Trip Distribution – 400,000 additional trips

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$2.00	-1%	0%	\$0.00	-1%	0%	\$0.00	-1%	0%	\$0.00
\$3.00	-1%	0%	\$0.00	-1%	0%	\$0.00	-1%	0%	\$0.00
\$4.00	0%	0%	\$0.01	0%	0%	\$0.01	0%	0%	\$0.01
\$5.00	1%	0%	\$0.02	0%	0%	\$0.02	0%	0%	\$0.02
\$7.00	2%	0%	\$0.15	1%	0%	\$0.13	2%	0%	\$0.13
Over \$7.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
ALL	0%	0%	\$0.09	0%	0%	\$0.08	0%	0%	\$0.08

Source: Frontier Economics' analysis of data provided by TfNSW

Table 14: Difference between Frontier Economics' sensitivity analysis of Sydney Metro North West trips on the projected 2019-20 Opal Trip Distribution – 600,000 additional trips

FARE UP TO	HOLIDAY			NORMAL			TOTAL		
	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE	TRIP DISTRIBUTION		AVERAGE FARE
	Adult	Concession		Adult	Concession		Adult	Concession	
\$0.00	-1%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
\$2.00	-1%	0%	\$0.00	-1%	0%	\$0.00	-1%	0%	\$0.00
\$3.00	-2%	0%	\$0.00	-1%	0%	\$0.00	-1%	0%	\$0.00
\$4.00	0%	0%	\$0.02	0%	0%	\$0.02	0%	0%	\$0.02
\$5.00	1%	0%	\$0.03	1%	0%	\$0.02	1%	0%	\$0.02
\$7.00	3%	0%	\$0.20	2%	0%	\$0.18	2%	0%	\$0.18
Over \$7.00	0%	0%	\$0.00	0%	0%	\$0.00	0%	0%	\$0.00
ALL	0%	0%	\$0.14	0%	0%	\$0.11	0%	0%	\$0.12

Source: Frontier Economics' analysis of data provided by TfNSW

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