

Victorian Official Fare Compliance Series

May 2022



Table of Contents

Table of Contents	2
Executive Summary	3
Background	4
Overview of the fare compliance survey	4
Definition and types of fare evasion	4
Data collection methodology	5
Survey scope	5
Calculation of fare compliance estimates	6
Results	7
Data collected	7
Fare compliance rates	7
Fare evasion behaviour	9
Fare compliance on metropolitan train	11
Fare compliance on metropolitan tram	12
Fare compliance on metropolitan bus	14
Fare compliance on regional train	15
Revenue impact of fare evasion	16
Appendix A - Precision and disaggregation of survey results	17
Confidence levels for survey estimates	17
Fare compliance estimates by mode	17
Estimated rates of fare evasion behaviour	18
Fare evasion estimates by ticket type	19
Fare evasion estimates for metropolitan train	20
Fare evasion estimates for tram	21
Fare evasion estimates for metropolitan bus	22
Fare evasion estimates for regional train	23
Appendix B - Revenue impact calculation	24

Executive Summary

As a part of the May 2022 fare compliance survey, the three metropolitan modes of transport of bus, tram and train were covered along with regional train services within the commuter belt. The impacts of COVID-19 have seen lower patronage across the transport network in Victoria throughout 2020 and to-date in 2022. Despite this, sample sizes are in line with pre-COVID surveys.

Compliance on the metropolitan network is high, with compliance at 95.9 percent for May 2022. COVID-19 impacts prevented the survey being run in May 2020, October 2020, and October 2021: as such trends cannot be drawn for this period. To provide context for these figures, in May 2021 fare compliance on the metropolitan network was 93.8 percent.

The year-on-year increase in metropolitan network fare compliance has been largely influenced by an increase of fare compliance on bus services. May 2022 bus fare compliance of 95.6 percent is an increase from results collected in October 2019 of 90.6 percent.

Tram compliance rates of 96.3 percent in May 2022 shows a slight year-on-year increase in compliance rates, from 96.2 percent in May 2021.

Metropolitan train compliance rates of 95.9 percent in May 2022 show a similar increase from the 95.8 percent observed in May 2021.

Compliance levels on regional train services continue to generally be lower than on metropolitan services. Regional train compliance rates in May 2022 of 90.4 percent are lower than results recorded in May 2021 of 91.2 percent.

The results from the May 2022 have been used to estimate the revenue impact of fare evasion over the period January to June 2022. The revenue impact is estimated at \$9.8 million for this period, comprising \$7.1 million on the metropolitan network and \$2.7 million on regional trains. This revenue loss is lower than past surveys due to the lower patronage on the network compared to pre-COVID surveys.

Background

Overview of the fare compliance survey

Fare compliance surveys are conducted by Public Transport Victoria (formerly by Metlink) in May and October each year to measure the rate of fare compliance on the public transport network. It is also a requirement of the metropolitan train and tram Franchise Agreements that fare compliance surveys are conducted in each half year period.

Fare compliance surveys have been conducted on metropolitan trains, trams and buses since 2005 and on regional train services since October 2012. In 2020, the impact of COVID-19 necessitated that the fare compliance survey not be run in either May or October 2020. Results were obtained in May 2021, however the continued impact of COVID-19 prevented the survey from running in October 2021. May 2022 therefore represents the second set of results obtained since October 2019.

Methodology and analysis requirements for the fare compliance survey are detailed in the survey practice notes¹ and outlined below. Results are reported to the public transport operators after each survey.

Definition and types of fare evasion

Fare evasion constitutes those who are travelling on public transport without a valid ticket. The fare evasion rate represents the percentage of all trips that are made without a valid ticket, including those taken on a concession ticket without a valid concession entitlement. The fare compliance rate is therefore the percentage of all trips that are made with valid tickets, and where appropriate, valid concessions. The fare compliance rate is equal to 100% minus the fare evasion rate.

Since May 2013, fare compliance on myki has been surveyed; prior to that both Metcard and myki fare compliance were surveyed. Regional train tickets are also included in the survey on regional trains.

The survey captures a range of fare evasion behaviours grouped into the following categories:

- *No ticket* – passengers travelling without a ticket or myki card
- *Runner* – passengers who when intercepted or believe they are about to be intercepted, get off the vehicle to avoid a ticket check
- *Full fare breach* – passengers travelling with an invalid full fare ticket (myki not touched on or with insufficient balance; validated but time expired or defaced/damaged or not validated; regional train ticket not valid for zone or off-peak ticket used at peak time)
- *Concession breach* – passengers travelling with an invalid concession ticket with a valid concession entitlement
- *No entitlement* – passengers travelling with a concession ticket (valid or invalid), without a valid concession entitlement

¹ Metropolitan Fare Evasion survey, May 2016 Practice Note – TRIM reference DOC/16/153590, Regional Train Fare Evasion Survey – May 2016 Practice Note – TRIM reference DOC/16/153636

- *Hoverer / purchaser* – passengers who remain close to a validator or ticket vending machine and validate, touch on or purchase a ticket only when there is a chance of interception; this behaviour is generally confined to trams and buses where validators are on board the vehicle
- *Insufficient balance* - passengers travelling multiple Zones with an insufficient myki money balance. The Victorian Fares and Ticketing Manual 2017 states that passengers are required to have a sufficient balance to cover all travel made.

Fare evasion using myki is also grouped into the following categories:

- *myki with insufficient balance* – where a myki has a zero or negative balance, due to the passenger not topping up the card before travel. A myki with insufficient balance cannot be touched on and therefore no fare is paid.
- *myki not touched on (with balance)* – where a myki card has funds but has not been touched on and therefore the passenger is not paying a fare for travel.
- *Ineffective myki* – where a myki card is defective such that it cannot be read by the Hand Held Device or Fare Payment Device, and therefore no fare is paid.

While any of these behaviours may in fact be accidental or deliberate fare evasion, the survey does not attempt to determine passenger intent and does not distinguish between the two.

Data collection methodology

The fare compliance survey is conducted by teams of Authorised Officers accompanied by survey staff. Survey teams on tram and bus have three surveyors and two Authorised Officers, while teams on trains normally have four Authorised Officers and three surveyors. Authorised Officers are provided by the operator. Digital data capture technology was used in the May 2022 survey, with a surveyor recording the data for each Authorised Officer where possible. A COVID-safe plan was developed in conjunction with, and agreed to by, DoT, all operators and EY Sweeney.

The teams are rostered to survey on specified routes or lines, on weekdays and weekends at set times. Survey methods vary by mode to accommodate differences in operating environments, for example, train passengers must touch on prior to boarding and prior to entering a platform, while tram and bus passengers may defer purchase or touch on until on-board. In general, the survey team boards a train, tram or bus and moves through the vehicle with Authorised Officers checking tickets and survey staff recording passenger counts and the types of tickets and fare evasion encountered. During peak times, surveying of train passengers may take place on platforms rather than on train carriages, due to crowding.

The survey of regional train is broadly similar to that conducted on metropolitan services. The May 2022 survey was conducted by conductors travelling on regional trains, accompanied by survey staff. On boarding a regional train service, the conductor and survey staff move through the entire train with conductors checking all tickets and survey staff recording the data as presented by conductors.

All evasions are recorded regardless of whether or not they would have attracted a 'Report of Non Compliance' in normal operation.

Survey scope

The metropolitan fare compliance survey is conducted on a representative sample of all train lines, tram routes and bus routes within the metropolitan area, with the exception of school bus routes. Surveys are

conducted between 7am and 7pm on weekdays and between 10am and 5pm on weekends. There are no surveys on buses on Sundays.

The survey program is designed to run over a four week period in May and October each year. The number of surveys completed depends on multiple factors including frequency of services, passenger numbers, size of each sample and survey hours per shift. Minimum sample sizes are determined by a formula set down in the survey practice note.

The regional train fare compliance survey encompasses all lines within the 'commuter belt', which is defined as rail lines extending as far out as Bendigo, Ballarat, Geelong, Traralgon and Seymour. The survey covers combinations of inbound and outbound services by am, off-peak and pm time bands, and by day type (weekday, Saturdays and Sundays).

Calculation of fare compliance estimates

Fare compliance estimates are derived from appropriately weighted survey data using statistical estimation procedures.

The weightings ensure that the survey results are representative of the true population, and not just of the sample collected. This corrects for the effects of any disproportionate sampling that may occur as a result of the sampling and scheduling process. This practice has been employed since 2008.

Ticket touch-ons and validations data (after application of validation rates) are used to determine the total number of trips in each survey strata, against which the survey data is weighted. Weights are determined for each location (train line, tram depot, bus areas), day of week (weekday, weekend) and time of day (am peak, off peak, pm peak) combination.

The primary aim of the survey is to measure the modal level fare compliance rates across the metropolitan network and on the regional train commuter belt train services. Although tickets are checked at various locations and times it is not possible to accurately report fare compliance rates for each strata or disaggregation within the survey as there is not always an adequate sample within each strata to report a meaningful result. Fare compliance rates for particular strata, such as location or time of day, are only reported where a meaningful and comparable result can be derived from the survey data as presented by conductors.

Following a review in consultation with the University of Melbourne's Statistical Consulting Centre, the statistical procedures for deriving the fare compliance estimates from the survey data were refined for the May 2010 survey. The new methods produce comparable estimates to previous surveys, but also provide a measure of precision for each estimate, including disaggregated estimates by location, time of day etc. The precision measures, or confidence intervals, indicate the extent to which the fare compliance estimates, particularly the disaggregated estimates, can be reasonably compared.

Details of the estimation procedures are included in technical reports provided by the University of Melbourne's Statistical Consulting Centre².

Please note: Figures are rounded to one decimal place throughout. This may mean that some combined results are impacted.

² Estimation programs for PTV's metropolitan fare compliance survey – TRIM reference DOC/14/139095.

Results

Data collected

In the May 2022 survey, over 30 thousand passengers were surveyed on the metropolitan network and nearly 10 thousand on V/Line train services. The numbers of passengers and services surveyed on each mode are shown in Table 1.

Table 1: Passengers Surveyed, May 2022 Fare Compliance Survey

Mode	Metropolitan Train	Tram	Metropolitan Bus	Metropolitan Network	Regional Train
Tickets Checked	10,296	10,777	10,841	31,914	9,628
Services Surveyed	1,159	1,345	2,711	5,215	416

Fare compliance rates

Estimated rates of fare compliance for all surveys from 2016 to date are shown in Figure 1 and the results from 2005 to date are shown in Table 2. Confidence levels for each estimate and disaggregated estimates by location, time of day and day type are set out in Appendix A - Precision and disaggregation of survey results.

Figure 1: Estimated fare compliance rate by mode (May 2016 - May 2022)

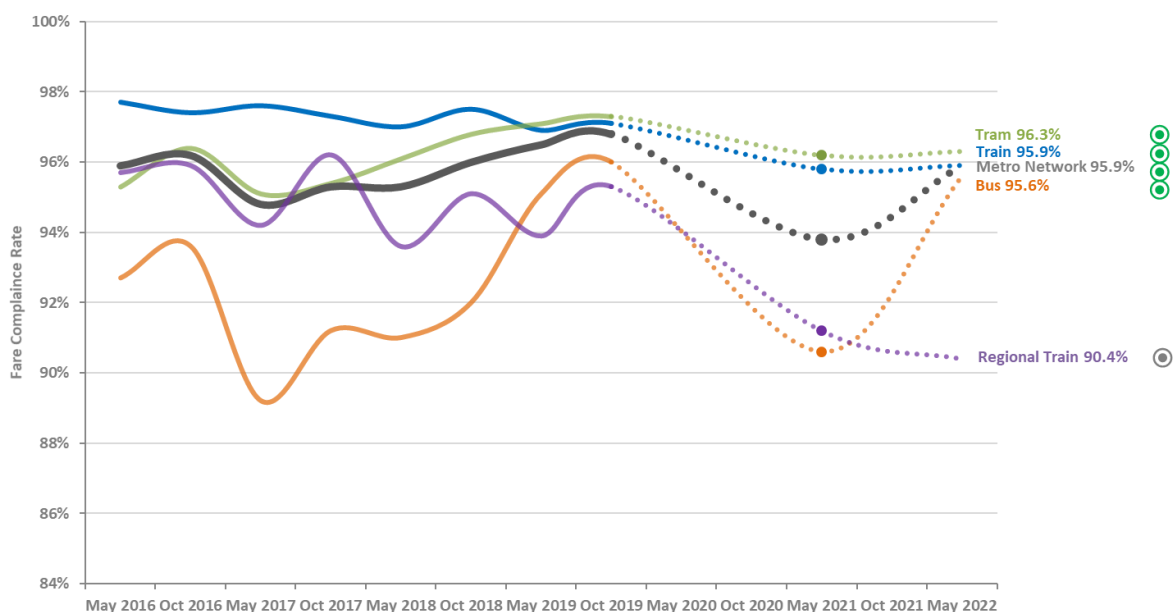


Table 2: Estimated fare compliance rate by mode (2005 - 2022) %

Survey Period	Metropolitan Train	Tram	Bus	Metropolitan Network	Regional Train
May 2005	86.5	80.6			
Oct 2005	89.3	84.7	83.9	86.6	
May 2006	89.4	86.9	90.1	88.6	
Oct 2006	90.4	88.9	91.9	90.1	
May 2007	86.1	90.8	91.9	88.9	
Oct 2007		90.6	92.9		
May 2008	93.7	90.2	92.6	92.2	
Oct 2008	92.5	88.0	93.1	91.0	
May 2009	92.3	85.9	94.4	90.4	
Oct 2009	91.2	87.4	94.1	90.4	
May 2010	90.6	83.7	93.4	88.7	
Oct 2010	89.0	81.2	92.7	86.9	
May 2011	90.2	79.7	90.8	86.5	
Oct 2011	91.5	81.6	92.4	88.1	
May 2012	88.3	86.7	91.7	88.5	
Oct 2012	91.2	89.5	90.9	90.6	
May 2013	90.1	88.1	84.0	88.1	
Oct 2013	91.6	92.0	88.8	91.1	
May 2014	93.7	91.2	87.3	91.3	95.1
Oct 2014	95.9	94.0	91.3	94.1	93.0
May 2015	97.3	95.2	91.3	95.0	93.9
Oct 2015	97.4	95.2	94.9	96.2	95.1
May 2016	97.7	95.3	92.7	95.9	95.7
Oct 2016	97.4	96.4	93.6	96.2	95.9
May 2017	97.6	95.1	89.2	94.8	94.2
Oct 2017	97.3	95.4	91.2	95.3	96.2
May 2018	97.0	96.1	91.0	95.3	93.6
Oct 2018	97.5	96.8	92.0	96.0	95.1
May 2019	96.9	97.1	95.1	96.5	93.9
Oct 2019	97.1	97.3	96.0	96.8	95.3
May 2020					
Oct 2020					
May 2021	95.8	96.2	90.6	93.8	91.2
Oct 2021					
May 2022	95.9	96.3	95.6	95.9	90.4

Note: survey not run in May and October 2020 due to COVID-related impacts.

Fare evasion behaviour

Table 3 and Figure 2 show fare evasion behaviour for the current survey by metropolitan mode and for regional trains. The most common forms of fare evasion in the May 2022 survey were no ticket and runners.

Table 3: Fare evasion behaviour by mode (May 2022 survey) %

Fare evasion behaviour	Metropolitan train	Tram	Metropolitan bus	Metropolitan network	Regional train
No ticket	1.5	1.8	2.9	2.0	1.6
Runner	1.0	1.0	0.5	0.8	-
Full fare breach	0.5	0.6	0.5	0.5	3.2
Concession breach	0.4	0.1	0.3	0.3	1.1
No entitlement	0.7	0.1	0.0	0.3	1.8
Hoverer/purchaser	0.0	0.1	0.0	0.0	-
Insufficient balance (V/Line only)	-	-	-	-	2.0
Invalid other (V/Line only)	-	-	-	-	0.0
Total	4.1	3.7	4.4	4.1	9.6

Note: not all fare evasion behaviours are relevant to all modes, as indicated by ‘-’

Figure 2: Fare evasion behaviour by mode (May 2022 survey) %

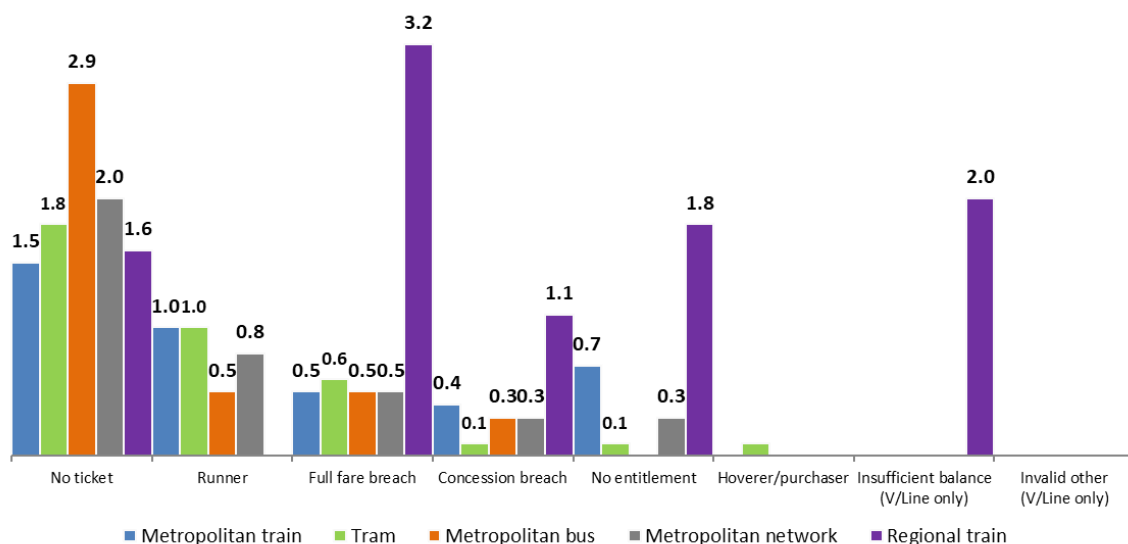


Figure 3 shows the incidence of different types of fare evasion behaviour on the metropolitan network since 2016.

Figure 3: Fare evasion behaviour, metropolitan network (May 2016 - May 2022)

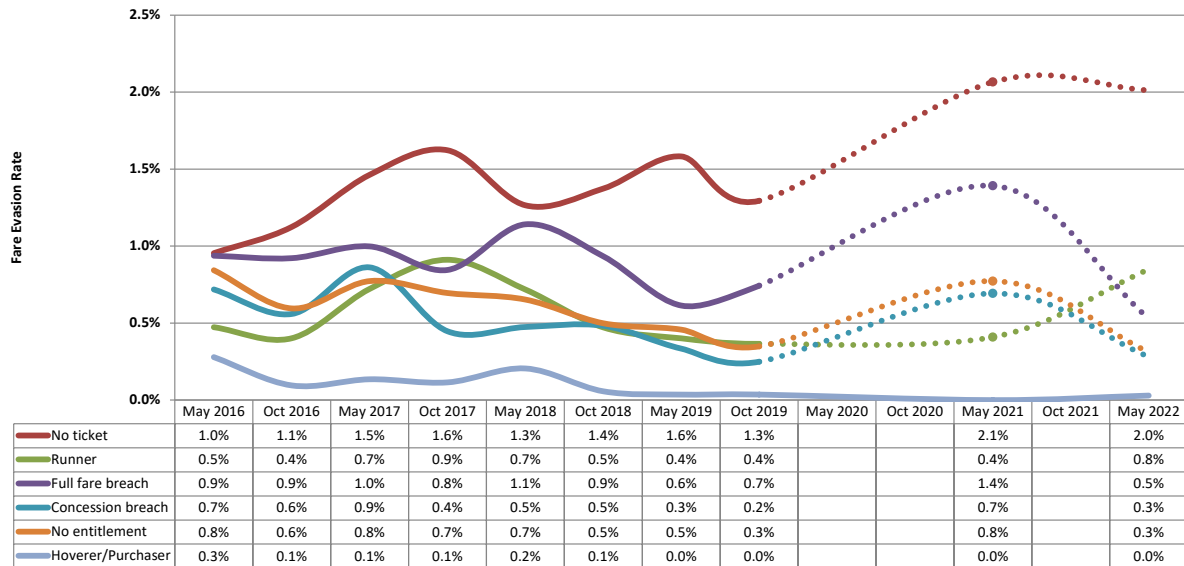
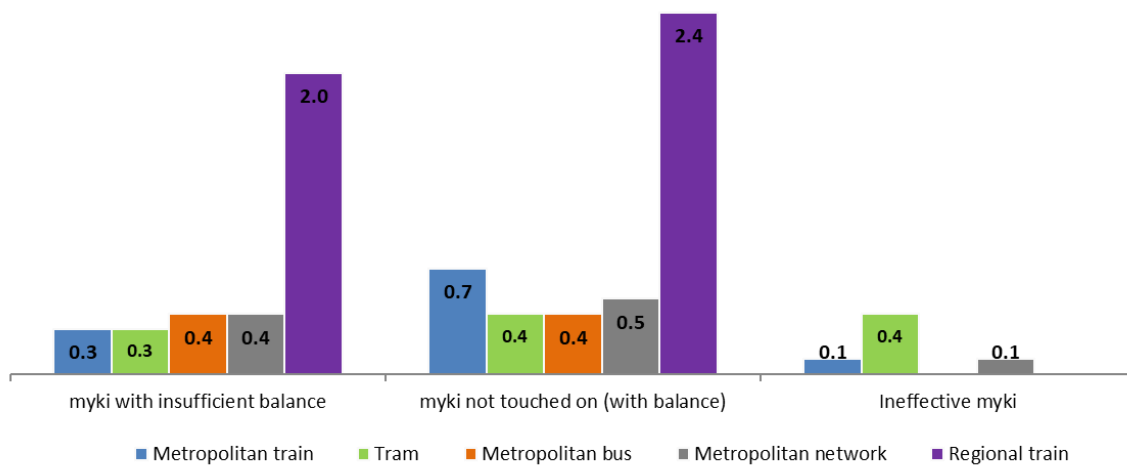


Table 4 and Figure 4 show myki fare evasion behaviour for the current survey for the metropolitan modes and regional train. The rates shown include both full fare and concession fare myki breaches.

Table 4: myki fare evasion behaviour by mode (May 2022 survey) %

myki Fare Evasion Behaviour	Metropolitan Train	Tram	Metropolitan Bus	Metropolitan Network	Regional Train
myki with insufficient balance	0.3	0.3	0.4	0.4	2.0
myki not touched on (with balance)	0.7	0.4	0.4	0.5	2.4
Ineffective myki	0.1	0.4	0.0	0.1	0.0

Figure 4: myki fare evasion behavior by mode (May 2022 survey) %



Fare compliance on metropolitan train

Figure 5: Fare evasion behaviour, metropolitan train (May 2016 - May 2022)

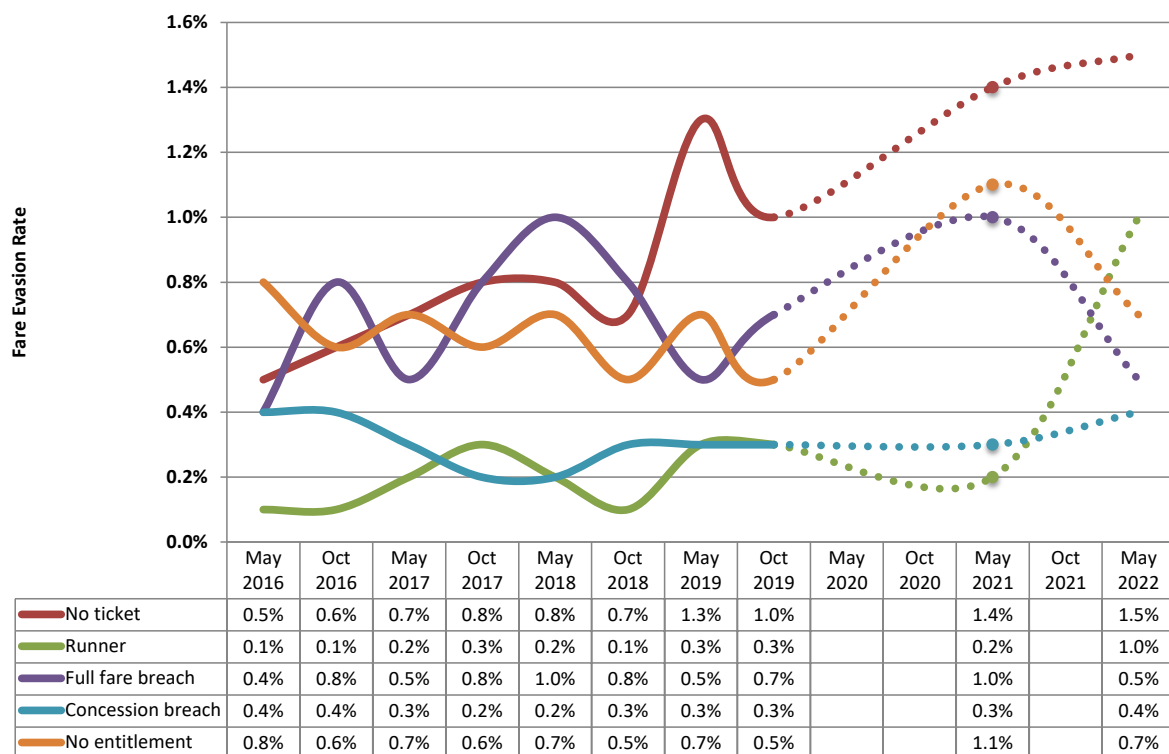
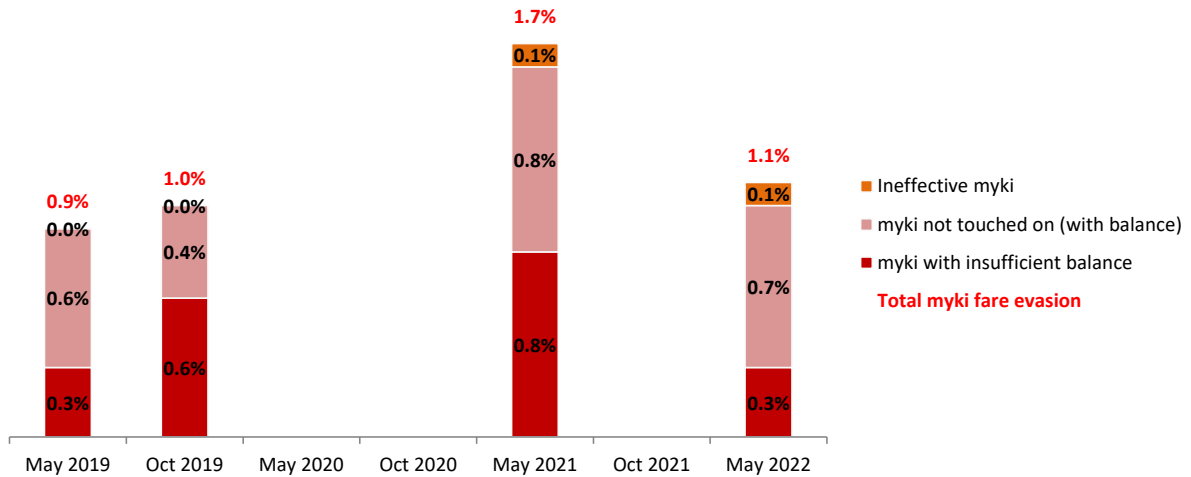


Figure 5 shows the incidence of fare evasion behaviour on metropolitan train since May 2009. Metropolitan train fare compliance XX.

Figure 6 shows the incidence of myki fare evasion behaviour on metropolitan train from May 2019 to May 2022.

Figure 6: myki fare evasion behaviour, metropolitan train (May 2019 - May 2022)



Fare compliance on metropolitan tram

Figure 7 shows the incidence of fare evasion behaviour on tram since May 2016.

Figure 7: Fare evasion behaviour, metropolitan tram (May 2016 - May 2022)

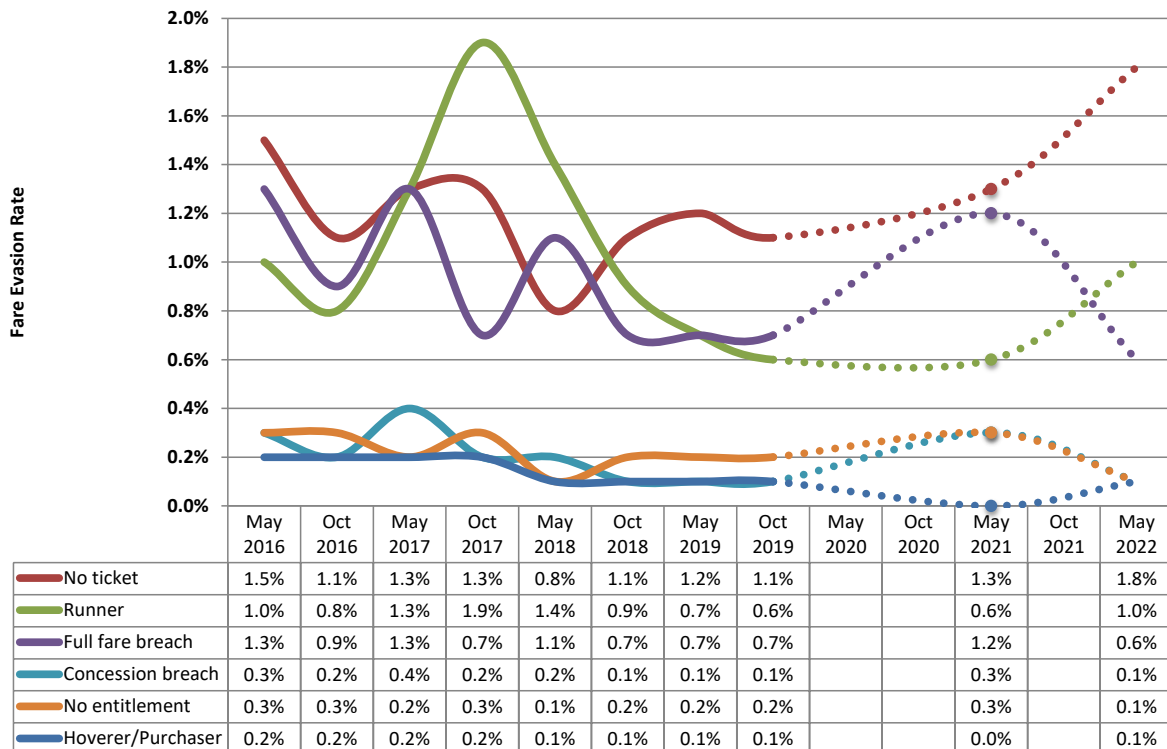
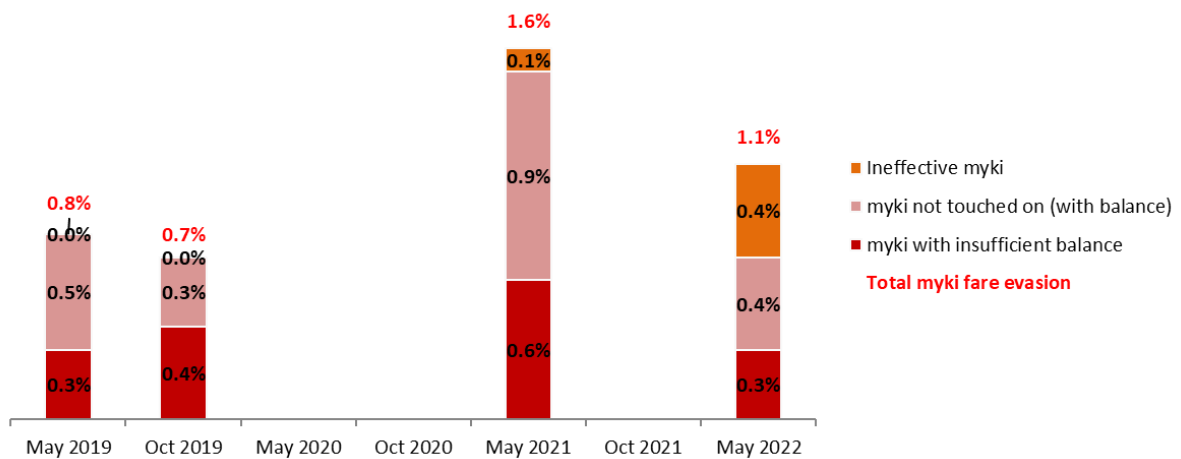


Figure 8 shows the incidence of myki fare evasion behaviour on metropolitan tram from May 2019 to May 2022.

Figure 8: myki fare evasion behaviour, metropolitan tram (May 2019 - May 2022)

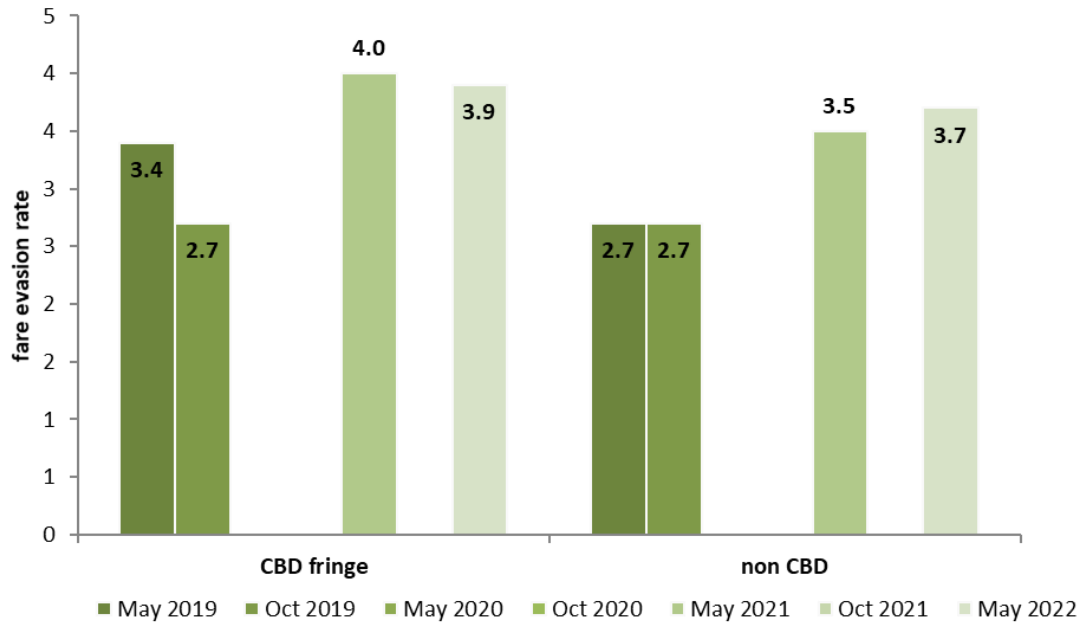


In the October 2014 fare compliance survey a new measure was added to monitor the difference between the fare compliance rate in the CBD, CBD fringe and non CBD. Table 5 and Figure 9 show the incidence of fare evasion by area on tram. No significant difference was observed between CBD fringe and non CBD areas in the May 2022 survey

Table 5: Fare evasion rate by area, tram (May 2022)

	Estimate	95% confidence interval
CBD	no longer measured	-
CBD fringe	3.9	2.9, 4.9
non CBD	3.7	3.1, 4.3

Figure 9: Fare evasion rate by area, tram (May 2019 - May 2022)



Fare compliance on metropolitan bus

Figure 10: Fare evasion behaviour, metropolitan bus (May 2016 - May 2022)

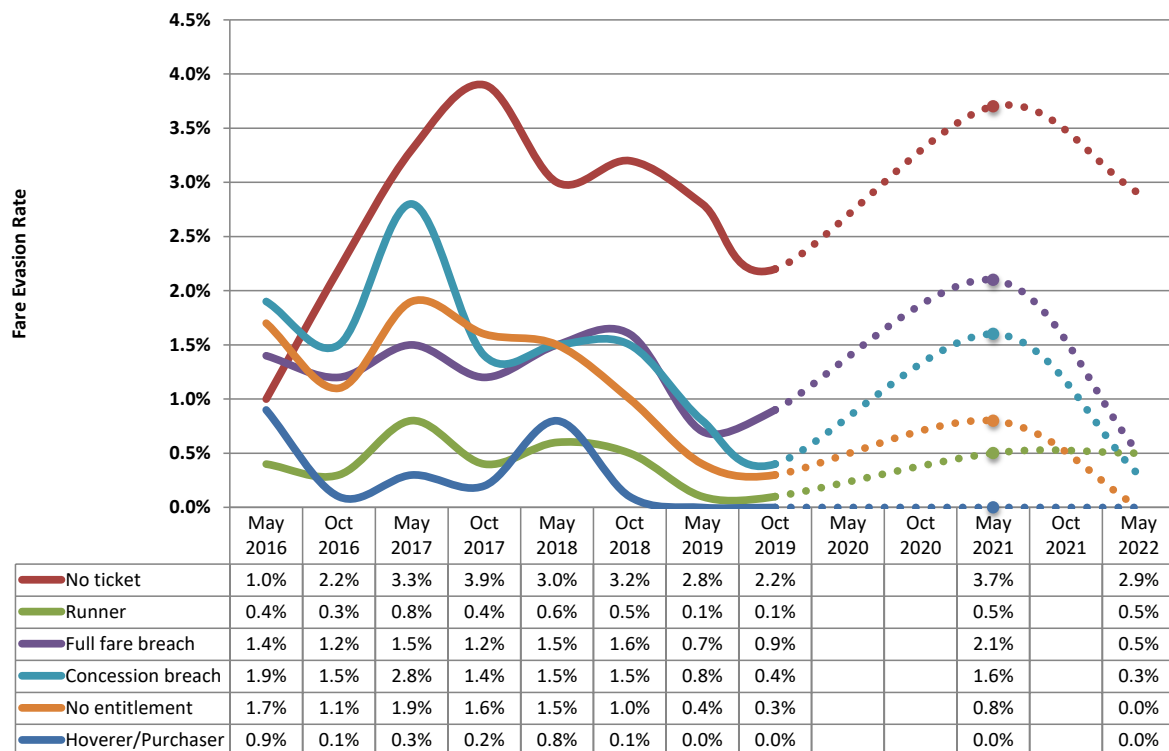
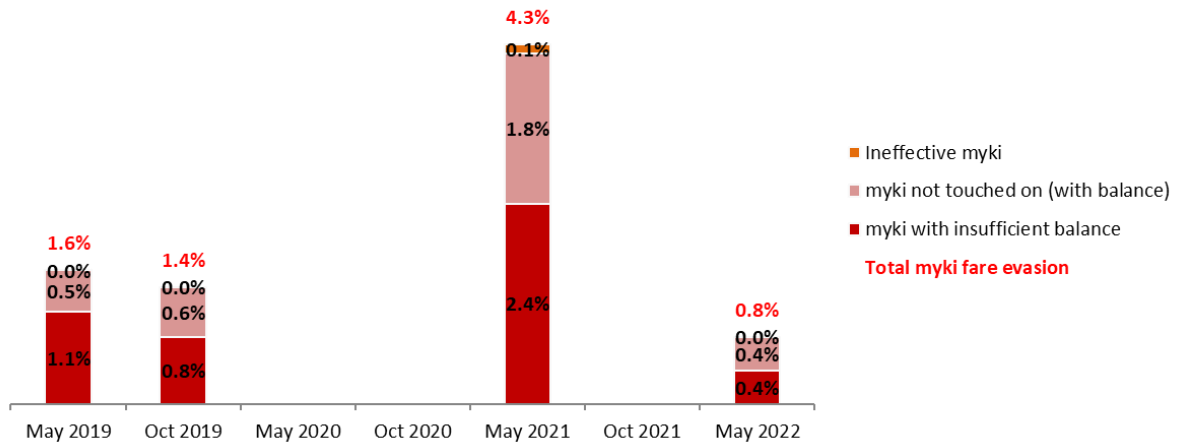


Figure 10 shows the incidence of fare evasion behaviour on metropolitan bus since May 2016.

Figure 11 shows the incidence of myki fare evasion behaviour on metropolitan bus from May 2019 to May 2022.

Figure 11: myki fare evasion behaviour, metropolitan bus (May 2019 - May 2022)



Fare compliance on regional train

Fare compliance surveys on regional train were introduced as part of the October 2012 survey.

Figure 12 shows the incidence of fare evasion behaviour on regional train from May 2016 to May 2022.

Figure 12: Fare evasion behaviour, regional train (May 2016 - May 2022)

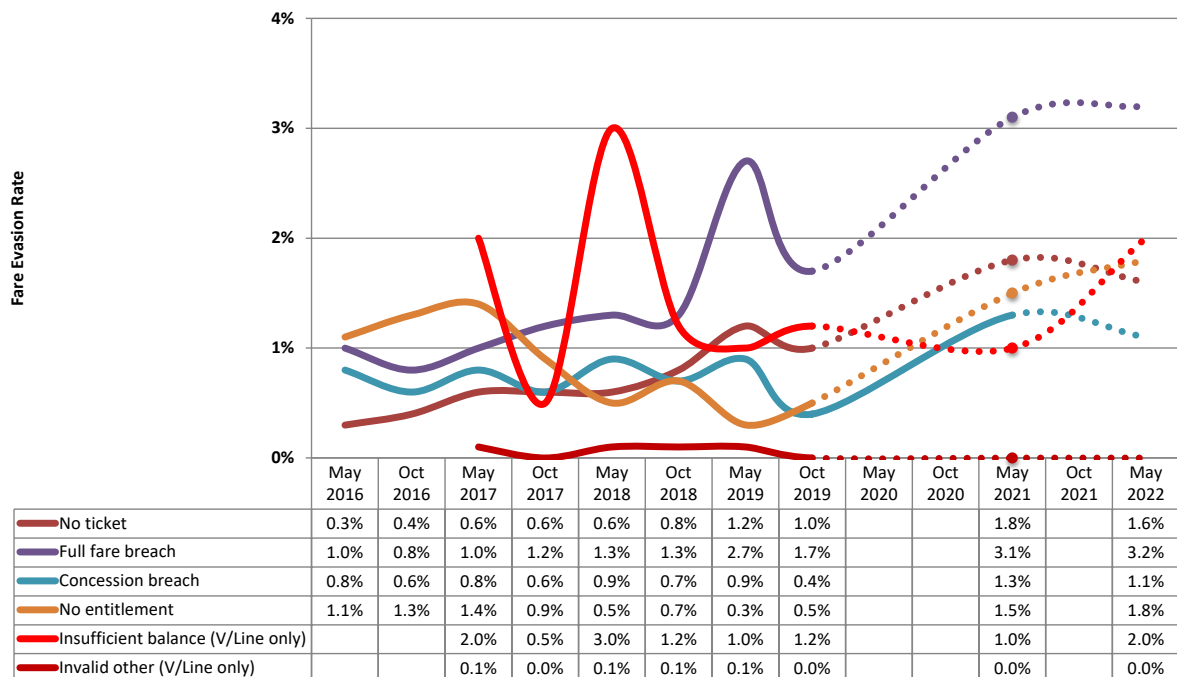
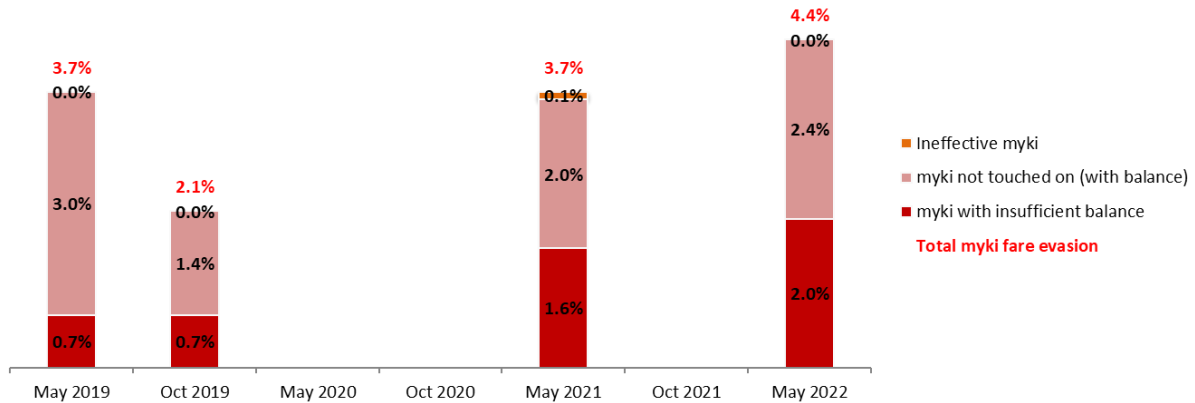


Figure 13 shows the incidence of myki fare evasion on regional train from May 2019 to May 2022.

Figure 13: myki fare evasion behaviour, regional train (May 2019 - May 2022)



Revenue impact of fare evasion

The revenue impact of fare evasion is an estimate of the value of fare revenue lost through fare evasion. Appendix B - Revenue impact calculation sets out the calculations applied to estimate the revenue impact.

The results of the May 2022 fare compliance survey is used to estimate the revenue impact of fare evasion. For the period January to June 2022, the revenue impact is estimated at \$7.1 million on the metropolitan network and \$2.7 million for regional trains; a total impact of \$9.8 million. Revenue impact has been provided for the 6-month period as the survey was not run in October 2021 due to COVID-related impacts. A full calendar year estimate will be provided following the October 2022 wave.

Table 7 shows the estimated revenue lost to fare evasion for this period. The estimated cost impact is exclusive of GST.

Table 7 - Estimated fare compliance revenue impact (May 2022) \$

	Metropolitan Train	Tram	Metropolitan Bus	Metropolitan Network	Regional Train	Total
Jan - Jun 2022	2.7	2.2	2.2	7.1	2.7	9.8

Appendix A - Precision and disaggregation of survey results

Confidence levels for survey estimates

The fare compliance survey is a sample survey, which means that a sample of public transport trips are surveyed in order to deduce the fare compliance rate across all trips on the public transport network. For this reason, the fare compliance rates produced by the survey are estimates and not exact measures of fare compliance.

Since 2010 the fare compliance survey and estimation procedures have enabled the calculation of a precision measure, in the form of a 95 per cent confidence interval, for each estimate. The 95 per cent confidence interval is interpreted as the range of values in which we are 95 per cent certain that the true measure occurs. For example, where a fare compliance estimate has a 95 per cent confidence interval of 96.9 to 98.5, we are 95 per cent certain that the true rate of fare compliance is within this range.

The confidence intervals provide an indication of the precision of each estimate, including the disaggregated estimates by location, day type and time of day. This measure of precision is used to indicate the validity of any comparison between estimates. For example, where the confidence intervals of two estimates overlap, it cannot be said with high confidence that either estimate is higher or lower than the other.

Fare compliance estimates by mode

Table 20 shows the estimated fare compliance rates and 95 per cent confidence intervals for each mode surveyed in the May 2022 survey. Estimates of the fare compliance rates exclusive of no entitlement fare evasion are also included, as these are used in the revenue impact calculations.

Table 6: Estimated fare compliance rates (May 2022) %

Fare compliance estimate	Metropolitan Train	Tram	Metropolitan Bus	Regional Train
Fare evasion rate	95.9	96.3	95.6	90.4
95% confidence interval	94.7, 97.1	95.8, 96.8	95.1, 96.1	87.1, 93.7
Fare evasion rate, excl. no entitlement	96.5	96.4	95.6	92.1
95% confidence interval	95.4, 97.6	95.9, 96.9	95.1, 96.1	89.4, 94.8

Estimated rates of fare evasion behaviour

Table 21 shows the estimates and 95 per cent confidence intervals (95% CI) for rates of each type of fare evasion behaviour per mode.

Table 7: Estimates of types of fare evasion per mode (May 2022) %

Types of fare evasion behaviour	Train	Train 95% CI	Tram	Tram 95% CI	Metropolitan Bus	Bus 95% CI	Regional Train	Regional Train 95% CI
No ticket	1.5	1.1, 1.9	1.8	1.5, 2.1	2.9	2.5, 3.3	1.6	0.9, 2.3
Runner	1.0	0.1, 1.9	1.0	0.7, 1.3	0.5	0.2, 0.8		
Full fare breach	0.5	0.3, 0.7	0.6	0.4, 0.8	0.5	0.3, 0.7	3.2	1.2, 5.2
Concession fare breach	0.4	0.2, 0.6	0.1	0.0, 0.2	0.3	0.2, 0.4	1.1	0.6, 1.6
No entitlement	0.7	0.5, 0.9	0.1	0.0, 0.2	0.0	0.0, 0.1	1.8	0.3, 3.3
Hoverer/Purchaser			0.1	0.0, 0.2	0.0	0.0, 0.0		
Insufficient balance							2.0	1.2, 2.8
Invalid other							0.0	0.0, 0.1
Total	4.1	2.9, 5.3	3.7	3.2, 4.2	4.4	3.9, 4.9	9.6	6.3, 12.9

Table 22 shows the estimates and 95 per cent confidence intervals (95% CI) for rates of each type of myki fare evasion behaviour per mode.

Table 8: Estimates of types of myki fare evasion per mode (May 2022) %

myki fare evasion behaviour	Train	Train 95% CI	Tram	Tram 95% CI	Metropolitan Bus	Bus 95% CI	Regional Train	Regional Train 95% CI
myki with insufficient balance	0.3	0.2, 0.4	0.3	0.2, 0.4	0.4	0.3, 0.5	2.0	1.2, 2.8
myki not touched on (with balance)	0.7	0.5, 0.9	0.4	0.2, 0.6	0.4	0.3, 0.5	2.4	1.5, 3.3
Ineffective myki	0.1	0.0, 0.2	0.4	0.2, 0.6	0.0	0.0, 0.0	0.0	0.0, 0.0

Fare evasion estimates by ticket type

As of 29th December 2012, myki is the sole ticket system operational on the metropolitan network and Metcard fare compliance is no longer included in the fare compliance survey. The roll out of myki onto regional train commuter belt trains was completed in March 2014, however regional train tickets can still be used for journeys that continue beyond the commuter belt. Since May 2013 the improper use of myki and regional train tickets has been separately identified in the regional train fare compliance survey.

Table 23 reports three types of breach (full fare breach, concession fare breach and no entitlement) for myki and regional train tickets

Table 9: Estimates for myki and regional train ticket fare evasion on regional train (May 2022)

Fare evasion behaviour	Regional ticket	Regional ticket 95% CI	myki	myki 95% CI
Full fare breach	0.0	0.0, 0.0	3.2	1.2, 5.2
Concession fare breach	0.0	0.0, 0.0	1.1	0.6, 1.6
No entitlement	0.6	0.1, 1.1	1.2	0.0, 2.5

Table 24 shows the rates of myki and other ticket type usage.

Table 10: Estimates for myki and other ticket type usage on regional train (May 2022)

myki behaviour	Estimate (%)	95% CI
Valid myki	81.0	66.2, 95.8
Invalid myki	7.4	4.5, 10.3
Total myki	88.4	72.0, 100.0
Valid regional ticket	6.8	4.0, 9.6
Invalid regional ticket	0.0	0.0, 0.1
Total regional ticket	7.4	4.3, 10.5
Valid other ticket (inc. free entitlement)	2.7	1.9, 3.5
No ticket	1.6	0.9, 2.3

Fare evasion estimates for metropolitan train

Table 25 shows the estimates of fare evasion rates and 95 per cent confidence intervals on metropolitan train by day type, time of day, and train line.

Table 11: Fare evasion estimates by strata, metropolitan train (May 2022)

Train Strata	Fare evasion estimate (%)	95% confidence interval
Overall	4.1	2.9, 5.3
Day Type		
Weekday	4.1	2.8, 5.4
Weekend	4.1	2.9, 5.3
Time of Day		
Monday to Friday, am peak	5.1	1.5, 8.7
Monday to Friday , off peak	4.0	2.7, 5.3
Monday to Friday , pm peak	3.5	2.2, 4.8
Line Group		
Alamein/Glen Waverley	4.8	2.2, 7.4
Dandenong/Pakenham	5.1	1.0, 9.2
Frankston	3.9	1.9, 5.9
Lilydale/Belgrave	2.5	1.0, 4.0
Sandringham	4.3	2.5, 6.1
South Morang/Hurstbridge	5.6	0.2, 11.0
Sunbury	3.5	1.0, 6.0
Upfield/Craigieburn	3.7	2.2, 5.2
Werribee/Williamstown	3.5	1.6, 5.4

Fare evasion estimates for tram

Table 14 shows the estimates of fare evasion rates and 95 per cent confidence intervals on tram by day type, time of day, and the tram depot from which the surveyed route originates.

Table 12: Fare evasion estimates by strata - tram

Tram Strata	Fare evasion estimate (%)	95% confidence interval
Overall	3.7	3.2, 4.2
Day Type		
Weekday	3.5	2.9, 4.1
Weekend	4.6	3.3, 5.9
Time of Day		
Monday to Friday, am peak	3.0	2.1, 3.9
Monday to Friday, off peak	2.9	2.1, 3.7
Monday to Friday, pm peak	4.5	3.3, 5.7
Depot		
Brunswick	6.3	4.5, 8.1
Camberwell	3.1	1.5, 4.7
Essendon	2.1	0.8, 3.4
Glenhuntly	3.4	1.9, 4.9
Kew	3.4	2.1, 4.7
Malvern	4.3	2.6, 6.0
Preston	3.6	2.0, 5.2
Southbank	2.9	1.7, 4.1
Area		
	Estimate	95% confidence interval
CBD	No longer measured	0.0
CBD Fringe	3.9	2.9, 4.9
Non CBD	3.7	3.1, 4.3

Fare evasion estimates for metropolitan bus

Table 15 shows the estimates of fare evasion rates and 95 per cent confidence intervals on metropolitan bus by day type and location.

Table 13: Fare evasion estimates by strata - metropolitan bus (May 2022)

Bus Strata	Fare evasion estimate (%)	95% confidence interval
Overall	4.4	3.9, 4.9
Day Type		
Weekday	4.4	3.9, 4.9
Saturday	5.0	3.0, 7.0
Location		
Altona Gate SC	3.8	1.8, 5.8
Box Hill RS	4.7	2.0, 7.4
Broadmeadows RS	6.8	3.7, 9.9
Chadstone SC	4.5	1.6, 7.4
Dandenong RS	5.0	2.0, 8.0
Doncaster SC	4.0	1.8, 6.2
Epping Plaza SC	4.1	2.2, 6.0
Footscray RS	7.1	2.4, 11.8
Fountain Gate SC	4.5	1.8, 7.2
Frankston RS	7.7	3.0, 12.4
Glen Waverley RS	3.3	1.2, 5.4
Greensborough SC	2.3	0.0, 4.7
Highpoint SC	4.6	1.8, 7.4
Knox City SC	4.4	1.9, 6.9
Lilydale RS	2.2	0.0, 4.4
Lonsdale St CBD	1.7	0.0, 3.6
Melton RS	6.6	1.7, 11.5
Monash University Clayton	2.4	0.3, 4.5
Moonee Ponds IC	4.5	2.4, 6.6
Northland SC	5.3	2.7, 7.9
Oakleigh RS	3.2	0.9, 5.5
Reservoir RS	6.1	3.5, 8.7
Ringwood RS	2.9	0.7, 5.1
Southland SC	3.8	0.7, 6.9
South Morang RS	4.6	1.4, 7.8
St Albans RS	3.5	1.2, 5.8
Sunshine RS	3.9	1.3, 6.5
Werribee Plaza SC	6.7	3.2, 10.2

Fare evasion estimates for regional train

Table 16 shows the estimates of fare evasion rates and 95 per cent confidence intervals on regional train by time of day, day type, direction and line.

Table 14: Fare evasion estimates by strata, regional train (May 2022)

Regional train strata	Fare evasion estimate (%)	95% confidence intervals
Overall	9.6	6.3, 12.9
Time of day / day type		
Peak	9.2	6.3, 12.1
Off peak	10.0	4.7, 15.3
Monday to Friday	9.8	6.1, 13.5
Saturday	8.5	6.0, 11.0
Sunday	8.7	5.8, 11.6
Direction		
To City (up)	12.8	5.5, 20.1
From City (down)	7.3	5.4, 9.2
Line		
Eastern	23.6	0.0, 47.4
North Eastern	5.4	3.0, 7.8
Northern	6.6	2.3, 10.9
Western	10.0	6.6, 13.4
South Western	7.4	3.5, 11.3

Appendix B - Revenue impact calculation

The level of fare compliance has an impact on fare revenue. The method used to estimate revenue lost uses the following inputs:

1. F_{mode} Fare evasion rate exclusive of 'No entitlement' – disaggregated by mode
2. C_{mode} 'No entitlement' – disaggregated by mode
3. T_{mode} Modal patronage as per cent of total patronage, for the period
4. $R_{network}$ Revenue for half year (this is network-wide, not available disaggregated by mode)
5. N Nominal concession ticket discount.

Step 1: Revenue impact percent (I_{mode})³

For each mode, $I_{mode} = (1 - N) \times C_{mode} + F_{mode}$ (1)

Step 2: Imputed half-year revenue by mode

With an integrated fare system there is no obvious way of disaggregating revenue generation by mode. The working definition, (employed here), is that revenue by mode is proportional to patronage by mode.

So for each mode, $R_{mode} = T_{mode} \times R_{network}$ (2)

Step 3: Estimated revenue impact in dollars (\$)

For each mode, $S_{mode} = I_{mode} \times R_{mode} \div (1 - I_{mode})$ (3)

³ This is equivalent to the previously agreed formulation of $I_{mode} = (1 - N) \times P_{mode} \times (1 - V_{mode}) + F_{mode}$, where P is the percentage of trips made by concession users and V is the valid concession percentage

Table 17 shows each of the inputs for each mode and the subsequent estimates of the impact on revenue.

Table 15: Calculation of the revenue impact of fare evasion (January – June 2022)

Category	Ref	Metropolitan train	Tram	Metropolitan bus	Metropolitan Network	V/Line train
Fare Evasion (excl. 'No entitlement')	F	3.5%	3.6%	4.4%		7.9%
No entitlement	C	0.7%	0.1%	0.0%		1.8%
Proportion of metropolitan patronage (%)	T	38.4%	34.3%	27.3%		
Revenue* for half year (\$m)	R				172.8	28.6
Assume conc. discount on average is	N	50.0%	50.0%	50.0%		50.0%
Revenue impact (%)	Eqn 1**	3.9%	3.7%	4.4%		8.7%
Revenue* for the half year By Mode (\$m)	Eqn 2**	66.4	59.3	47.2		
Revenue* impact by mode (\$m)	Eqn 3**	2.7	2.2	2.2	7.1	2.7