

Review of the Taxi Cost Fare Index Model: Taxi Fleet Mix Change

*Department of
Transport and Main
Roads*

Draft report

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1 Introduction

1.1 Background

The Department of Transport and Main Roads (DTMR), Queensland, currently uses the Taxi Cost Fare Index (TCFI) model to measure the cost of providing taxi services. The TCFI was developed in 2007 and adjusted in 2010 by PwC. In 2007, most taxis in Queensland were fuelled by LPG and petrol. Since then, there has been a shift from LPG vehicles to hybrid vehicles. Now, hybrid vehicles comprise 62.3% of Queensland's conventional taxi fleet and 50.8% of Queensland's total taxi fleet. This indicates that hybrid vehicles now represent the median taxi in Queensland.

The change in both vehicle type and the reduction in fuel consumption, are likely to have significant impacts on the cost weights in the current TCFI model, and potentially the inflators.

1.2 Scope of work

The current TCFI, set in 2007, was based on a median taxi being a vehicle solely designed for LPG consumption—the current TCFI assumed a Ford Falcon. With an increasing proportion of hybrid taxis, the median taxi has effectively changed in Brisbane to a hybrid vehicle (i.e. Toyota Camry Hybrid).

The review of the TCFI model did not just involve the fuel components of the model, but five other components—particularly those related to the purchase price of the vehicle since hybrid vehicles have a higher purchase price relative to standard LPG vehicles. As a result, every single cost weighting was updated as part of this review.

It is however important to note that this review was limited to the cost components and assumptions that are relevant to the median vehicle change to hybrid vehicle. For example, this review did not consider the number of shifts and average kilometres travelled per year.

1.3 Structure of report

This report consists of the following sections:

- Chapter 2 provides an overview of the approach undertaken to review the current TCFI model,
- Chapter 3 provides our key findings and decisions points which informed the revised TCFI estimates, and
- Chapter 4 presents a summary of our findings and our proposed next steps for the TCFI model.

2 *Our approach*

Our approach was developed to focus solely on updating the current TCFI to address the specific issue of how changes to the Queensland taxi fleet impact upon costs in the industry. Therefore, we adopted an approach which sought to:

- Minimise changes to the model, and
- Address the cost weights affected by the move to a hybrid taxi.

The key steps undertaken in this TCFI model review, which focuses on the recent changes in the Queensland taxi fleet, are set out below.

Step 1: Identify the model components affected by a hybrid vehicle

The first task was to review in detail which of the model components would be affected by the median vehicle changing to a hybrid vehicle. This task involved:

- Considering the current model components and indicators, and how aspects such as fuel type, vehicle model, etc. might amend the cost scale; and
- Reviewing in detail the 2007 report and supporting model to consider key assumptions that were assumed in developing the cost weightings.

Step 2: Estimate the current value of each cost component in the current model

The TCFI has been reviewed on a six-monthly basis, by obtaining and applying updated cost inflators to each cost component. The weightings (e.g. 45% weighting for labour), however, have not been amended since the TCFI update in 2007.

If any of the cost components changed as a result of the vehicle change (e.g. the size of the operating cost component decreased due to the median vehicle change), the cost weightings for ALL operating cost components would have to change. As the model was based on percentage weightings and not monetary weightings, this was not a straightforward process.

Subject to the underlying assumption for each individual cost component, this task involved one of the following steps:

- Obtaining the 2007 underlying monetary estimate and applying the specified inflator for that cost component to inflate the monetary estimates from September 2007 to September 2013 values; or
- Obtaining the current (September 2013) monetary estimates for the cost component based on the underlying assumption in the current model, e.g. the comprehensive insurance premium was sourced directly from the Taxi Industry Australia Insurance Broker (TIAIB).

In developing this, it is important to qualify that the monetary values were used purely to develop the cost weightings and are indicative only. For cost components that were identified to be unaffected by the median vehicle change, these new cost estimates were directly fed into the cost weighting calculation for their respective cost components.

Step 3: Review updates required for each cost component

In this step, we reviewed each of the affected cost components and proposed assumptions for deriving the new cost estimates.

To do this, we examined the detailed assumptions in the current model, such as how they are affected by the fleet type, vehicle purchase cost, etc. Depending on the underpinning assumption, we adopted one of the following approaches to estimating revised costs:

Our approach

- Where possible, we recalculated or obtained new cost estimates based on new input values that are associated with the new median vehicle, e.g. new purchase price, fuel consumption, etc.; or
- We proposed a percentage increase or decrease from the cost component's current value.

Step 4: Workshop to discuss and agree on key decision points and assumptions

In this step, PwC hosted a workshop² on 20th November 2013 that was attended by DTMR and the Taxi Council of Queensland (TCQ).

The purpose of the workshop was to:

- Discuss and agree on the assumptions for each cost component, and
- Come to a decision on four key decision points (refer to Table 2 for more details), which formed the basis for some cost estimates.

The decisions and assumptions that were agreed on were used to inform the revised cost estimates and index weightings.

Step 5: Assess inflators for each cost component

The final task involved us checking whether the inflators were still relevant to the respective cost component, following the updated cost weightings.

² Attendees from DTMR included Lee Baker, Amanda Gibbons, Janine Girvan, and Scott Notley. Attendees from TCQ included Benjamin Wash and Wayne Crookes.

3 Key findings and discussion points

3.1 Cost components affected by the median vehicle change

PwC identified five cost components that are likely to be directly affected by the median taxi changing to a hybrid vehicle.

Table 1 below identifies these cost components and the current 2007 TCFI assumptions, which explains why these cost components are expected to be affected by the median vehicle change.

Overall, 34% of the index weights of the current TCFI model were assessed as being affected by the median taxi change.

Table 1 Current 2007 cost component affected and unaffected by median vehicle change

Cost component	Current (2007) TCFI Model Assumptions (\$ in 2007 values)	Directly affected by hybrid vehicle?	2007 index weights ³	Comment (see Table 5 for detailed updates relevant to the revised TCFI model)
Driver labour	Based on traditional income sharing agreement, where drivers retain approximately 45% of the revenue (if they do not pay for the fuel, or 50% per cent if fuel is paid for by drivers), and operators retain approximately 5% of the revenue per taxi operated	No	45%	
Operator labour		No	5%	
Fuel	1. The average number of kilometres travelled per taxi in 2006 was 157,000 km per annum 2. The average LPG fuel price was 54.7 c/L 3. Average consumption of LPG in taxis of 4.5 km/L	Yes	14%	Hybrid vehicles consume petrol instead of LPG, and have lower fuel consumption.
Repair & Maintenance labour	1. Eight major services for eight hours each (64 hours in total) 2. Eight minor services for four hours each (32 hours in total) 3. An allowance of 35 hours of unplanned maintenance per annum 4. An average mechanics rate of \$55 per hour	Yes	5%	Hybrid vehicles may require less maintenance because they are newer vehicles.

³ Index weights indicate the percentage of operating cost that is attributed to each cost component.

Key findings and discussion points

Cost component	Current (2007) TCFI Model Assumptions (\$ in 2007 values)	Directly affected by hybrid vehicle?	2007 index weights ³	Comment (see Table 5 for detailed updates relevant to the revised TCFI model)
Parts & panels	<ol style="list-style-type: none"> In 2003/2004, the ACT repairs and maintenance cost including both maintenance labour and parts and panels was \$15,948. Applying 13.5% inflation over four years to inflate 2003/2004 to 2007 values. The 2007 labour maintenance cost was estimated in Repair & Maintenance labour cost. 	Yes	8%	Hybrid vehicles' battery is expected to be replaced every 2.7 years (refer to Table 5 for explanation).
Cleaning	<ol style="list-style-type: none"> An average of 208 hours per year spent cleaning a taxi An average hourly cost rate of \$14 per hour in 2007 This amounted to approximately \$8 per day.	No	2%	Refer to Table 5 for revisions to assumptions.
Comprehensive insurance	Comprehensive insurance from the Taxi Industry Australia Insurance Brokers (TIAIB) for a \$20,000 vehicle with a 40% no claim bonus.	Yes	3%	Hybrid vehicles have a higher vehicle value relative to LPG vehicles, and comprehensive insurance increases with vehicle value.
Third party insurance	Class 3 vehicles, with Input Tax Credit Entitlement (ITCE) for 12 months cover, from QBE insurer.	No	3%	
Vehicle leasing charges	<ol style="list-style-type: none"> 4 year lease at 8.5% interest with a 10% residual value The purchase value of vehicle was \$13,176 An annual fit-out cost of \$1,706 	Yes	3%	Vehicle leasing charges changes according to vehicle purchase price.
Network fees	In 2007, market quotes for network fees was \$8,145 per annum for Black and White Taxis and \$7,788 per annum for Yellow Cabs. This index weight was estimated as the average fee of these two networks, the two largest taxi networks in Queensland. This was estimated as \$7,967.	No	6%	
Other	<ol style="list-style-type: none"> Tyre cost of \$2,700 from ACT estimates based on lower-cost suppliers Personal accident work injury cost by TCQ at \$498 per annum Uniforms cost of \$600 according to ACT estimates Government charges of \$1,000 \$2,000 of other expenses. 	No	5%	Assume that hybrid vehicles do not impose additional costs that have not already been captured in the cost components above. Refer to Table 5 for revisions to assumptions.

Source: PwC, December 2007, *Review of Options for Adjusting Taxi Fares for Cost Movements in Queensland*; and prepared by PwC

3.2 The Proposed Revised TCFI Cost Component Assumptions

To calculate the revised TCFI, each cost component was re-estimated to reflect the cost component's current value or the median vehicle change.

For cost components assessed as likely to be affected by the median vehicle change, we examined the current TCFI's assumptions and updated or changed assumptions that are directly affected by the median vehicle change. For example, to estimate vehicle leasing charges, we changed the vehicle purchase value and interest rate, while retaining other assumptions such as lease period and residual value.

To estimate cost components assessed as unlikely to be affected by the median vehicle change, PwC applied the current TCFI's assumptions but escalated values to reflect current September 2013 values, or sourced updated values from appropriate sources.

In some instances where costs could be estimated based on more than one assumption, PwC identified options that were discussed and agreed during the workshop.

During the workshop with DTMR and TCQ, PwC presented proposed assumptions for each cost component, as well as four key decision points. Table 2 below states the four key decision points, cost components that were directly affected by each decision, and the options presented for each decision point.

Table 2 Key Decision Points

Key decision points	Cost components directly affected	Options
1. The median taxi type	Fuel cost Parts and panels cost Comprehensive insurance cost Vehicle leasing charges	Option 1: Toyota Prius Option 2: Toyota Prius V Option 3: Toyota Camry Hybrid
2. Fuel consumption under taxi driving conditions	Fuel cost	Option 1: Manufacturer's estimate Option 2: Applying a ratio to the manufacturer's estimate to increase fuel consumption reflecting taxi driving conditions
3. Repair and maintenance cost	Repair and maintenance cost	Option 1: No change to current assumptions Option 2: Decrease current estimate by 10%
4. Parts and panels cost	Parts and panels cost	Option 1: No change to current assumptions Option 2: Include hybrid battery cost in addition to current estimate

Source: Prepared by PwC from review of the current 2007 model and discussions with DTMR and TCQ.

The first decision point on the median taxi type was an overarching assumption which directly affected multiple cost components, while the other decision points were specific to individual cost components. This section therefore discusses the median taxi profile first, followed by the assumptions underpinning the individual cost estimates. This section also discusses the chosen options and any further changes to the assumptions which were agreed on during the workshop.

The Median Taxi Profile

The current TCFI model was derived based on the 'typical taxi', which was defined based on the taxi vehicle type with the largest number in the fleet. The median taxi's profile was the basis for the TCFI index weights estimation, and it affected all cost components in the TCFI.

Table 3 below presents the three median taxi options for the revised TCFI, as well as the assumed median taxi for the current TCFI model, for comparison purposes.

It is important to note that features discussed in Table 3 below are only features relevant to the median vehicle change (i.e. to a hybrid vehicle). Features that were not relevant to the change to hybrid vehicle but were assumptions that assist to define the 'median taxi' include the number of shifts, owner-driver vs. owner-operator taxis, etc. Such assumptions were not

reviewed or updated from the current 2007 TCFI model due to the specified scope of this review.

Table 3 Options for the Median Taxi Profile (relevant to vehicle type)

Features	Taxi type for current (2007) model ⁴	Potential taxi type for revised (2013) model		
		Option 1	Option 2	Option 3
Option				
Vehicle	Ford Falcon	Toyota Prius	Toyota Prius V	Toyota Camry Hybrid
Seats	5-seater	5-seater	7-seater	5-seater
Vehicle value	\$13,176	\$37,000 ¹	\$39,000 ¹	\$38,000 ¹
Fit-out cost	\$6,824	\$8,095	\$8,095	\$8,095
Fuel type	LPG	Unleaded petrol and electricity	Unleaded petrol and electricity	Unleaded petrol and electricity
Fuel consumption²	5.5 km/L	25.6 km/L	23.3 km/L	17.5 km/L
Average km travelled per year	157,000 km	157,000 km	157,000 km	157,000 km
Insurance assumption (TIAIB)	40% no claim bonus & \$20,000 agreed value (including fit-out), including all-charges	40% no claim bonus & \$45,000 agreed value (including fit-out), including all-charges	40% no claim bonus & \$47,000 agreed value (including fit-out), including all-charges	40% no claim bonus & \$46,000 agreed value (including fit-out), including all-charges
Additional cost		Battery cost approximately \$3,200 ³	Battery cost approximately \$6,300 ³	Battery cost approximately \$4,000 ³

Notes:

- Prices are full driveaway price for business registration (source from Toyota Australi a), excluding compulsory third party insurance premium for Class 1, with ITCE and 12 months cover (sourced from MAIC), and rounded up to the nearest thousand.
- Fuel consumption is manufacturer's estimate for urban cycle only. This is sourced from the Green Vehicle Guide, <http://www.greenvehicleguide.gov.au/GVGPublicUI>.
- Hybrid battery cost for all 3 vehicle were estimated as the mid-point taxi pricing cost (where taxi pricing was unavailable, the retail price was used) quoted by Downtown Toyota (Ian Ottaway) and Southside Toyota's (Nick Pittard) Parts Department in Brisbane on 10th December 2013. Quotes were received via e-mail. Please note that these estimates have been rounded up to the closest hundred.
- PwC, December 2007, *Review of Options for Adjusting Taxi Fares for Cost Movements in Queensland*

During the workshop, it was decided that the median vehicle for the revised TCFI model will be the Toyota Camry Hybrid. This is supported by DTMR's analysis of the Queensland fleet data, as at 22nd November 2013, that is presented in Table 4 below.

Table 4 Queensland Taxi Fleet Data

Licence types	Vehicle type	Number of vehicles
Conventional Taxi Service Licence	Honda Insight	1
	Honda Civic	1
	Toyota Prius	920
	Toyota Camry	733
	Non-hybrid vehicles	963
Wheelchair Accessible Taxi Service Licence		642
Total Queensland taxi fleet		3,260

Source: DTMR, data as at 22nd November 2013.

It is important to qualify that there was a change in the way the median vehicle was selected between the current and revised TCFI model. In the 2007 TCFI, the representative taxi was selected based on the vehicle type with the largest number in the taxi fleet. Based on the workshop between PwC, DTMR and TCQ, the median taxi for the revised TCFI was selected based on median operating cost; where the taxi fleet was sorted from the most to least

economical with the assumption that hybrid vehicles are more economical than other vehicles in the fleet.

Assumptions for individual cost components

Table 5 below discusses the assumptions underpinning the revised cost estimates for each cost component. It provides our assumptions for estimating each cost component, and the changes or decisions made during the workshop with DTMR and TCQ.

During the workshop, DTMR and TCQ also advised on some additional changes which were not within the effects of the median vehicle change, relating to cleaning and uniform costs. These changes are noted in the table below.

Table 5 Revised TCFI cost component assumptions

Cost components	Directly affected by hybrid vehicles?	Proposed assumption to estimate values for the revised (2013) model	Workshop decision
Driver labour	No	As per the current TCFI model, the weight was proposed to be determined based on traditional income sharing agreement, where drivers retain approximately 45% of revenue.	No change
Operator labour	No	As per the current TCFI model, the weight was proposed to be determined based on traditional income sharing agreement, where operators retain 5% of revenue.	No change
Fuel	Yes	<p>Fuel cost was proposed to be estimated based on the following assumptions:</p> <ul style="list-style-type: none"> • Average km travelled per year is 157,000km (as per the current TCFI model) • Unleaded petrol price is based on prices in metro Brisbane. It was assumed to be 147.6 c/L, which is the 6 month average unleaded petrol price between April 2013 and September 2013.⁴ • The manufacturer's urban cycle⁵ fuel consumption estimate for the Toyota Camry Hybrid is 17.5 km/L⁶ • Taxis consume more fuel per km travelled relative to private car users due to different usage characteristics. <p>We provided DTMR and TCQ with these options during the workshop:</p> <p><i>Option 1: Fuel consumption is equivalent to manufacturer's urban cycle fuel consumption estimate, i.e. 17.5 km/L.</i></p> <p><i>Option 2: Apply the proportion of the current TCFI model's assumed vs. urban cycle's fuel consumption, to the manufacturer's urban cycle fuel consumption estimate. Taxis are estimated to travel 82% of the urban cycle estimated distance for every litre of fuel. (refer to Appendix A for more information)</i></p>	Option 2 was selected. The applied fuel consumption is 14.4 km/L (estimated as 82% of 17.5 km/L).

⁴ FUELtrac, <http://www.aaa.asn.au/issues/petrol.htm>, assessed on 18th November 2013.

⁵ The urban cycle fuel consumption estimation is conducted according to Australian Design Rule (ADR) 81/02 involving a series of stop-start procedures with the vehicle travelling at a speed of up to 50km/h.

Cost components	Directly affected by hybrid vehicles?	Proposed assumption to estimate values for the revised (2013) model	Workshop decision
Repair & Maintenance labour	Yes	<p>Repair and maintenance labour cost may decrease because the Toyota Camry Hybrid is a relatively new vehicle and should need less servicing.</p> <p>We considered the following options:</p> <p><i>Option 1: No change to the current cost</i></p> <p><i>Option 2: Decrease the current cost by 10%</i></p>	Option 1 was selected.
Parts & panels	Yes	<p>Hybrid cars have an additional component, the hybrid battery, which is costly to change.</p> <p>Also, most Hybrid Camry taxis are new vehicles, which suggest they may incur less parts and panels cost, excluding the hybrid battery cost.</p> <p>We proposed the following options:</p> <p><i>Option 1: No change to the current cost</i></p> <p><i>Option 2: Add hybrid battery cost to the current cost</i></p> <p>We considered the following assumptions for estimating the hybrid battery cost:</p> <ul style="list-style-type: none"> The Toyota Camry Hybrid's hybrid battery cost is approximately \$4,000⁷. While hybrid cars' battery warranty covers the first 160,000 km travelled, hybrid batteries can last up to 350,000km or 500,000 km for a Prius⁸. We assumed each battery is changed once in 2.7 years, based on an average battery life of 425,000km (the mid-point of the range) for the Toyota Camry Hybrid. 	Option 2 was selected. The additional battery cost amounts to an average of \$1,478 per year. The total parts and panels cost is \$13,101 per year.
Cleaning	No	<p>As per the current TCFI model, we proposed the following assumptions:</p> <ul style="list-style-type: none"> An average of 208 hours per year is spent on cleaning An average hourly rate of \$14 per hour (2007 value). <p>Inflated to 2013 values based on CPI for Brisbane.</p>	Agreed that cleaning cost would be estimated as \$4 per day per vehicle, assuming this cleaning cost is incurred 365 days per year. Cleaning cost is estimated as \$1,860 per year.
Comprehensive insurance	Yes	<p>Retain the assumptions in the current TCFI model, with a change in agreed value. In other words, we propose to assume 40% no claim bonus and \$46,000 agreed value (purchase value with fit-out cost), with the inclusion of all administration and broker fees.</p>	No change

⁶ Green Vehicle Guide, <http://www.greenvehicleguide.gov.au/GVGPublicUI>, assessed on 25th November 2013.

⁷ Hybrid battery cost was estimated as the mid-point of taxi pricing cost (where taxi pricing was unavailable, the retail price was used) quoted by Downtown Toyota (Ian Ottaway) and Southside Toyota's (Nick Pittard) Parts Department in Brisbane on 10th December 2013. Quotes were received via e-mail. Please note that these estimates have been rounded up to the closest hundred.

⁸ Car Advice, July 2008, 'Toyota Prius the Taxi Champion', <http://www.caradvice.com.au/14639/toyota-prius-the-taxi-champion/>, assessed on 26th November 2013.

Key findings and discussion points

Cost components	Directly affected by hybrid vehicles?	Proposed assumption to estimate values for the revised (2013) model	Workshop decision
Third party insurance	No	Retain the assumptions in the current TCFI model, where third party insurance was estimated as the class 3 compulsory third party insurance premiums for 12 months with Input Tax Credit Entitlement (ITCE) for taxis (cars and station wagons only), sourced from Motor Accident Insurance Commission (MAIC).	No change
Vehicle leasing charges	Yes	Retain the assumptions in the current TCFI model, with a change in vehicle purchase price. The assumptions are: <ul style="list-style-type: none"> • 4 year lease at 8.03%⁹ interest with 10% residual value • Vehicle purchase value of \$38,000 • Annual fit-out cost of \$2,024 	Agreed to adjust the residual value to 5%.
Network fees	No	Retain the assumptions in the current TCFI model, where, network fee was estimated as the average between the two largest taxi networks in Queensland, Black and White (B&W) Cabs and Yellow Cabs.	No change
Other	No	Retain the assumptions in the current TCFI model, where other expenses include: <ul style="list-style-type: none"> • Tyres of \$2,700 from ACT estimates based on lower cost suppliers • Personal accident work injury cost of \$4,987 per annum • Uniform cost of \$600 based on ACT estimates • Government charges of \$1,000 • \$2,000 of other expenses (all \$ estimates are in 2007 values)	Agreed to exclude uniform cost from model. Other cost equates to \$7,353 in 2013 value.

Source: Prepared by PwC based on PwC, December 2007, *Review of Options for Adjusting Taxi Fares for Cost Movements in Queensland* and discussions with DTMR and TCQ.

Based on the assumptions and decision points discussed and agreed during the workshop, we derived the cost estimates for the proposed revised TCFI model. Table 6 displays the revised cost estimates, alongside cost estimates for the current TCFI model in both September 2007 and September 2013 (current) values.

⁹ Average 3 month interest rate between July and September 2013, sourced from Reserve Bank of Australia (RBA), October 2013, F05 Lending Indicator Rates, Small Business Term Loan Rate.

Table 6 TCFI revised cost estimates

Cost component	Current TCFI (2007) model Sept 2007 values ¹	Current TCFI (2007) model Sept 2013 values	Revised TCFI (2013) model Sept 2013 values ¹⁰
Driver labour	-	-	-
Operator labour	-	-	-
Fuel	\$ 19,084	\$ 24,858 ²	\$ 16,148
Repair & Maintenance labour	\$ 7,205	\$ 8,888 ³	\$ 8,888
Parts & panels	\$ 10,890	\$ 11,623 ⁴	\$ 13,101
Cleaning	\$ 2,912	\$ 3,454 ⁵	\$ 1,860
Comprehensive insurance	\$ 4,593	\$ 7,583 ⁶	\$ 7,726
Third party insurance	\$ 3,812	\$ 6,906 ⁷	\$ 6,906
Vehicle leasing charges	\$ 4,693	\$ 4,670 ⁸	\$ 12,606
Network fees	\$ 7,967	\$ 9,722 ⁹	\$ 9,722
Other	\$ 6,798	\$ 8,064 ⁵	\$ 7,353
Subtotal (exclude labour and plate lease fees)	\$ 67,954	\$ 85,770	\$ 84,309

Note: The TCFI excludes labour cost and plate lease fees, which indicates that the total operating cost is underestimated.

Source:

- ¹ PwC, December 2007, *Review of Options for Adjusting Taxi Fares for Cost Movements in Queensland*
- ² Inflated based on Brisbane Metro 6-month average LPG prices from September 2007 to September 2013.
- ³ Inflated based on Queensland Labour Price Index from September quarter in 2007 to September quarter in 2013.
- ⁴ Inflated based on Brisbane Consumer Price Index for Motor Vehicle Parts and Accessories from September quarter in 2007 to September quarter in 2013.
- ⁵ Inflated based on Brisbane Consumer Price Index for All groups from September quarter in 2007 to September quarter in 2013.
- ⁶ September 2013 insurance premium sourced from Taxi Industry Australia Insurance Broker (TIAIB), based on the current 2007 model assumptions.
- ⁷ September 2013 insurance premium sourced from Motor Accident Insurance Commission (MAIC) based on the current 2007 model assumptions.
- ⁸ Adjusted based on 3-month average small business term loan rate between September 2007 and September 2013, sourced from RBA, F05 Lending Indicator Rates.
- ⁹ Inflated based on the average of Yellow Cabs and Black and White Cabs radio service fees between September quarter in 2007 and 2013, sourced by TCQ.
- ¹⁰ Prepared by PwC based on assumptions that was discussed and agreed on with DTMR and TCQ.

Comparing the current and revised TCFI model estimates (i.e. in current September 2013 values), the key cost estimates affected by the median vehicle change are as follows:

- **Fuel cost** has decreased by approximately 35% due to the increased fuel efficiency of the Toyota Camry Hybrid relative to the 2007 median taxi (i.e. the Ford Falcon).
- **Repair and maintenance cost** has remained the same, which reflects the assumption that there will be no change in repair and maintenance cost between the new and old median vehicle.
- **Parts and panels cost** has increased by \$1,478, which reflects the average hybrid battery cost per year¹⁰.
- **Comprehensive insurance cost** has increased by \$143 due to Toyota Camry Hybrid's higher purchase price.

¹⁰ The annualised hybrid battery cost is estimated based on the quoted cost to purchasing a new hybrid battery (i.e. \$4,000, refer to Table 5) divided by the assumed battery life of 2.7 years (refer to Table 5). Please note that these figures are rounded figures, thus recalculating this cost may not provide the exact figure reported above.

- **Vehicle leasing charges** have increased by the largest percentage relative to the other cost components. It has increased by 70%, from \$4,670 to \$12,606. This is attributed to Toyota Camry Hybrid's higher purchase price.

The additional changes that were advised by DTMR and TCQ during the workshop has resulted in the following cost adjustments:

- **Cleaning cost** has decreased by 46%, from \$3,454 to \$1,860, due to a revision in the way the cost is estimated.
- **Other cost** has decreased by 9%, from \$8,064 to \$7,353, due to the exclusion of uniform costs.

Overall, the operating cost has decreased relative to the current TCFI model's cost estimates in current values. However, this decrease is mostly attributed to the additional cost revisions advised by DTMR and TCQ during the workshop.

When assessing the median vehicle change independently, this change results in an increase in operating costs by \$845. This suggests that the fuel cost savings from a hybrid vehicle is less than the additional cost incurred in parts and panels, comprehensive insurance and vehicle leasing charges. The additional cost revisions have resulted in a decrease of \$2,306.

3.3 The Proposed TCFI Index Weights

The revised TCFI index weights have been derived based on the cost estimates discussed above. Table 7 below presents the index weights for the current and revised model.

Table 7 Comparison between the 2007 and 2013 TCFI model

Cost component	Current TCFI (2007) model Sept 2007 values	Current TCFI (2007) index weights	Revised TCFI (2013) model Sept 2013 values	Revised TCFI (2013) index weights
Driver labour	-	45.0%	-	45.0%
Operator labour	-	5.0%	-	5.0%
Fuel	\$ 19,084	14.0%	\$ 16,148	9.6%
Repair & Maintenance labour	\$ 7,205	5.3%	\$ 8,888	5.3%
Parts & panels	\$ 10,890	8.0%	\$ 13,101	7.8%
Cleaning	\$ 2,912	2.1%	\$ 1,860	1.1%
Comprehensive insurance	\$ 4,593	3.4%	\$ 7,726	4.6%
Third party insurance	\$ 3,812	2.8%	\$ 6,906	4.1%
Vehicle leasing charges	\$ 4,693	3.5%	\$ 12,606	7.5%
Network fees	\$ 7,967	5.9%	\$ 9,722	5.8%
Other	\$ 6,798	5.0%	\$ 7,353	4.4%
Total	\$ 67,954	100%	\$ 84,309	100%

Note: Weights may not add up to 100% due to rounding error.

Source: PwC, December 2007, *Review of Options for Adjusting Taxi Fares for Cost Movements in Queensland*; and prepared by PwC.

The key changes in index weights between the current and revised models are as follows:

- **Fuel cost** weight decreased from 14% to 9.6%, which reflects the decrease in fuel cost.
- **Parts and panels cost** weight decreased from 8.0% to 7.8%. Though parts and panels cost have increased in monetary terms, index weights are calculated relative to the total operating cost. A decrease in its weight indicates that the percentage increase in parts and

panels cost is less than the percentage increase in total operating cost between the current and revised TCFI.

- **Cleaning cost** weight decreased from 2.1% to 1.1% due to the cost revision decided during the workshop.
- **Comprehensive insurance cost** weight increased by around one-third, from 3.4% to 4.6%. In current value terms, comprehensive insurance cost only increased marginally by \$143. However, comprehensive insurance cost increased by 65% between 2007 and 2013 in the current TCFI, as displayed in Table 6. Thus, the increase in weights for comprehensive insurance is explained by cost inflation between 2007 and 2013.
- **Third party insurance cost** weight increased from 2.8% to 4.1%. Similarly, this is attributed to the cost inflation in third party insurance between 2007 and 2013, which is evident in Table 6.
- **Vehicle leasing charges cost** weight increased from 3.5% to 7.5%, which reflects the increase in cost attributed to Toyota Camry Hybrid's higher purchasing cost.
- **Network fees cost** weight decreased from 5.9% to 5.8%, which reflects the cost adjustment between 2007 and 2013.
- **Other cost** weight decreased from 5.0% to 4.4% due to the cost revision decided during the workshop.

Overall, the fuel cost is still the most heavily weighted cost component, after driver and operator labour costs.

3.4 Inflatons for the revised TCFI model

Despite the change in cost weights, the underlying characteristic of each cost component remains largely the same. For example, the year-on-year increase in the parts and panels cost is still most accurately represented by the consumer price index (CPI) for motor vehicle parts and accessories, regardless of whether it includes battery cost or not. Thus, this means the associated inflator for most cost components remains the same.

However, there are a few exceptions where the median vehicle change has affected the cost component's associated inflators. This includes:

- Fuel cost will be inflated by the unleaded petrol price rather than the LPG price. This is attributed to the difference in fuel type between the new and old median vehicle. However, data for the new inflator can still be sourced from FUELtrac.
- Comprehensive insurance will be inflated based on an insured value of \$46,000 instead of \$20,000 for the previous median vehicle.

Table 8 summarises the inflators associated with the new cost components and indicates if the inflators have changed between the current and revised model.

Table 8 Inflatons for TCFI cost components

Cost component	Inflatons for the 2013 model	Source	Changes between current and revised model
Driver labour	Queensland Labour Price Index (LPI)	ABS	No change
Operator labour	Queensland LPI	ABS	No change
Fuel	Brisbane Metro Unleaded Petrol Price	FUELtrac	Changed from LPG price to unleaded petrol price

Key findings and discussion points

Cost component	Inflators for the 2013 model	Source	Changes between current and revised model
Repair & Maintenance labour	Queensland LPI	ABS	No change
Parts & panels	Brisbane CPI for Motor Vehicle Parts and Accessories	ABS	No change
Cleaning	Brisbane CPI for all sectors	ABS	No change
Comprehensive insurance	Premium for M RATE (40% no claim bonus & \$46,000 agreed value) including all charges	TIAIB	Insured value has changed from \$20,000 to \$46,000 depending on vehicle type
Third party insurance	Class 3 CTP Premium for 12 months with Input Taxi Credit Entitlement (ITCE)	Motor Accident Insurance Commission (MAIC)	No change
Vehicle leasing charges	Small business term loan rates*	RBA	No change
Network fees	Average of Yellow Cabs and B&W Cabs radio dues/service fees	Yellow Cabs and B&W Cabs	No change
Other	Brisbane CPI for all sectors	ABS	No change

Source: Prepared by PwC based on PwC, December 2007, *Review of Options for Adjusting Taxi Fares for Cost Movements in Queensland*.

4 Conclusion

4.1 Summary

The TFCI model is used to measure the cost of providing taxi services in Queensland. When the current TFCI was developed, it was developed based on the representative vehicle at that time, which was assumed to be a Ford Falcon. Now, hybrid vehicles comprise 62.3% of Queensland's conventional taxi fleet and 50.8% of Queensland's total taxi fleet; which makes hybrid vehicle representative of the median taxi in Queensland.

This review was conducted to revise the TFCI to be representative of the current median vehicle, assumed to be a Toyota Camry Hybrid.

Based on assumptions that have been discussed and agreed on by DTMR and TCQ, PwC has revised the cost estimates and index weights for all cost components within the TFCI. The summary of the revised TFCI is presented in Table 9 below.

Table 9 Summary of the Revised TFCI

Cost component	Cost weight	Escalation basis	Mid-year submission	End of year submission	Alternative timeframe (other than 6 month)
Driver labour	45.0%	QLD Labour Price Index (LPI)			
Operator labour	5.0%	<i>Source: ABS Cat no 6345.0 Table 2b. Total Hourly Rates of Pay Excluding Bonuses: All Sectors by State, Original (Quarterly Index Numbers)</i>	Mar quarter compared to previous Sep quarter	Sep quarter compared to Mar quarter	In the case where a TFCI review did not result in an increase in taxi fares, the escalation factors should reflect changes in cost since the most recent fare increase (instead of usual 6 month period). The change in relevant period impacts estimates of fuel cost slightly differently to other cost components. In the case of fuel, the average price over the previous 6 month period should be compared to the average price over the current 12
Maintenance labour	5.3%				
Fuel	9.6%	Brisbane Metro Unleaded Petrol Price <i>Source: FUELtrac provided by TCQ</i>	6-month average of Mar compared to 6-month average of last Mar	6-month average of Sep compared to 6-month average of Mar	
Parts & panels	7.8%	CPI Motor vehicle parts and accessories (Brisbane) <i>Source: ABS Cat no. 6401.0 Table 13. CPI: Group, Sub-groups and Expenditure Class, Index Numbers by Capital City</i>	Mar quarter compared to previous Sep quarter	Sep quarter compared to Mar quarter	
Cleaning	1.1%	CPI: All groups (Brisbane) <i>Source: ABS Cat no. 6401.0 Table 1 and 2.</i>	Mar quarter compared to previous Sep quarter	Sep quarter compared to Mar quarter	
Other	4.4%	<i>CPI: All Groups, Index Numbers and Percentage Changes</i>			
Comprehensive insurance	4.6%	Premium for M RATE (40% No Claim Bonus & 46,000 Agreed Value) including all charges <i>Source: Taxi Industry Australia Insurance Brokers (TIAIB) provided by TCQ</i>	Mar compared to previous Sep	Mar compared to previous Sep	
Third party insurance	4.1%	Class 3 CTP premiums for 12 months with Input Taxi Credit Entitlement (ITCE) for Taxi (cars and station wagons only) <i>Source: Motor Accident Insurance Commission (MAIC) provide by TCQ</i>	Apr rates compared to previous Oct rates ¹¹	Oct rates compared to Apr rates	

¹¹ Rates should be quoted for the beginning of the month, e.g. 1st of April or 1st of October.

Cost component	Cost weight	Escalation basis	Mid-year submission	End of year submission	Alternative timeframe (other than 6 month)
Vehicle leasing charges	7.5%	Small Business Term Loan Rate <i>Source: Reserve Bank of Australia (RBA) Fo5 Lending Indicator Rates</i>	3-month average of Mar quarter compared to 3-month average of previous Sep quarter	3-month average of Sep quarter compared to 3-month average Mar quarter	month period (assuming the most recent fare increase was 12 months ago).
Network fees	5.8%	Yellow Cabs and B&W Cabs radio dues/service fees (adjusting 12 months annual charges into monthly fees include GST) <i>Source: Yellow Cabs and B&W Cabs General Manager, provided by TCQ</i>	Mar quarter average fee compared to previous Sep quarter average fee	Sep quarter average fee compared to Mar quarter average fee	

Note: Weights may not add up to 100% due to rounding error.
 Source: Prepared by PwC based on PwC, December 2007, *Review of Options for Adjusting Taxi Fares for Cost Movements in Queensland*.

4.2 Limitations

This review was limited to cost components that were affected by the median vehicle change. It precluded other cost components in the TCFI model, with the exception of a few revisions to the current cost estimates.

This poses some limitations to this review. For example:

- Cost components and assumptions that were not relevant to the median vehicle changing to hybrid vehicle were excluded from this review. This means that a large proportion of the assumptions underpinning the revised TCFI are still based on to the taxi industry in 2007, which may have changed over time.
- The current TCFI’s cost estimates were based the pre-2007 TCFI, supplemented with survey and research conducted by other states. This may not be representative of the Queensland’s taxi operating cost given the difference in regulatory backdrop and market type.

To address some of these limitations, DTMR may consider undertaking a full TCFI review, as well as conducting a survey amongst Queensland taxi drivers and operators, to gather local data that can inform these cost estimates.

Appendix A

Fuel consumption

Driving conditions for taxis differ greatly from those of private vehicles. For example, taxis are more likely to wait for passengers with the engine running and be stuck in congested traffic, relative to private car users. These driving conditions results in higher fuel consumption per km travelled.

In the current TCFI model, the assumed fuel consumption for the median vehicle (Ford Falcon) is 4.5km/L, which is lower than the manufacturer's estimation for urban cycle¹² of 5.5km/L¹³. This indicates that the taxis are able to travel 82% of the manufacturer's estimated travel distance, for every litre of fuel consumed.

This is supported by a few other taxi industry surveys, which indicated average fuel consumption to be close to the assumed fuel consumption of 4.5km/L. Other fuel consumption estimates are as follows:

- New South Wales' Centre for International Economics' Survey in 2011, indicated that the average fuel consumption for taxis is 4.6km/L¹⁴. Majority of the taxi vehicles in this survey were Ford Falcons, which makes this estimate most comparable to the current TCFI model's assumed fuel consumption.
- Western Australia's 2007 Taxi Cost Index survey estimated an average fuel consumption of 5.8km/L.
- Australian Taxation Office's (ATO) issued a small business benchmark for taxi drivers and operators, which indicated an average fuel consumption of 5.6km/L for LPG fuel.¹⁵

The US Department of Energy estimated the average fuel consumption for Toyota Prius taxis to be 20.4km/L¹⁶. This is 80% of the manufacturer's urban cycle estimate of 25.6km/L¹⁷. This supports the current TCFI model's taxi fuel consumption estimate, which is 82% of the manufacturer's estimate.

Therefore, we proposed to estimate fuel consumption with the same assumption used in the 2007 TCFI model (i.e. for every litre of fuel consumed, a taxi travels 82% of the manufacturer's estimated distance under the urban cycle driving condition). This was presented as *Option 2* during the workshop.

¹² Urban cycle fuel consumption is estimated based on the Australian Design Rules (ADR) 81/02 involving a series of stop-start procedure with the vehicle travelling at up to 50km/h.

¹³ Green Vehicle Guide, www.greenvehicleguide.gov.au/GVGPublicUI, assessed on 25th November 2013.

¹⁴ This estimate is back calculated based on an assumed average LPG price of 60.9 c/L.

¹⁵ Australian Taxation Office (ATO), Small business benchmark: Taxi drivers and operators, <http://www.ato.gov.au/Business/Small-business-benchmarks/In-detail/Benchmarks-A-Z/R-Z/Taxi-drivers-and-operators---issued-2013/>, assessed on 25th November 2013.

¹⁶ U.S. Department of Energy, 'Hybrid Taxis Give Fuel Economy a Lift', <http://www.afdc.energy.gov/pdfs/45148.pdf>, assessed on 25th November 2013.

¹⁷ Green Vehicle Guide, www.greenvehicleguide.gov.au/GVGPublicUI, assessed on 25th November 2013.

