

# **Fit for Purpose?**

## **A Review of Aspects of the CAA Triennial Funding Review**

**A report prepared for the New Zealand Aviation Federation**

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## Table of contents

<b>1. Executive summary .....</b>	<b>4</b>
<b>2. Introduction .....</b>	<b>5</b>
<b>3. Funding of the Medical Unit .....</b>	<b>5</b>
3.1 Background .....	5
3.2 Overview .....	6
3.3 Medical pricing and the CAA's Medical Unit.....	7
3.4 Pricing and the application fee .....	10
3.5 Detailed analysis of specifically identified goods.....	11
3.6 Proposed reclassification of services .....	14
3.7 Recommendations .....	15
3.8 Practicality of recommended changes.....	15
3.9 Stakeholder support for the proposed changes .....	15
3.10 Medical funding concluding remarks.....	16
<b>4. Aviation fuel levy .....</b>	<b>17</b>
4.1 Large domestic freight operators .....	18
4.2 Agricultural operators .....	24
<b>5. Conclusions .....</b>	<b>27</b>
<b>Appendix 1: Assessment of the number of medicals.....</b>	<b>28</b>
<b>Appendix 2: Breakdowns of proposals .....</b>	<b>30</b>

## List of tables

Table 1: Current CAA split .....	9
Table 2: Proposed changes .....	14
Table 3: MoT's notional domestic freight fleet.....	18
Table 4: Levy calculations as presented by the MoT .....	19
Table 5: Capacity utilisation sensitivity .....	20
Table 6: Average flight times .....	20
Table 7: MoT's notional agricultural fleet.....	25
Table 8: Implications for the notional operator .....	26
Table 9: Aerowork's agricultural fleet.....	26
Table 10: Implications of the different levies for Aerowork's cost comparison.....	26
Table 11: Phoenix's aviation fleet .....	27
Table 12: Implications of the different levies for Phoenix's cost comparison.....	27
Table 13: Medicals issued .....	28
Table 14: Forecast medical applications opened.....	28
Table 15: Proposal 2 breakdown, user pays AMC .....	30
Table 16: Proposal 3 breakdown, user pays AMC and related extras .....	30
Table 17: Proposal 4 breakdown, all functions discussed are removed from application fee .....	31

## List of figures

Figure 1: MoT's estimates of notional fleets .....	18
Figure 2: Freightways Group .....	23

## 1. Executive summary

This report examines certain aspects of the Civil Aviation Authority's (CAA) triennial funding review. The report focuses firstly on the medical certification application fee and concludes that, based on our application of the Treasury's guidelines, the cost of a medical application should decrease from \$183 (excl. GST) to \$70 (excl. GST) with an offsetting increase in fees for the specific users of associated services. Secondly, we consider two aspects of the analysis carried out by the MoT of the proposal for an aviation fuel levy to replace most other levies placed on the aviation industry to fund the CAA. Our analysis concludes that the MoT should reassess its analysis of the likely impacts of a fuel levy, and in particular the impacts on a typical large domestic freight operator and a typical agricultural operator.

In relation to medical certification, all pilots are required to hold a current medical certificate in order to be considered fit to fly. The duration of a medical certificate depends on the current age and health of a pilot. The medical certification process is overseen by the CAA's Medical Unit. Funding for the Medical Unit is on a cost-recovery basis with the costs recovered through a flat medical application fee. To date this fee has been calculated as the total funding the medical unit requires divided by the expected number of applications received in a given year. That is, the Medical Unit has been funded solely by the medical certificate applicants who benefit by being certified to fly, and all applicants contribute evenly to the funding. However, in the current funding review the CAA has proposed that the club of aviation consumers also benefits from having a regulated medical certification process. This lead the CAA to break down the functions of the medical unit and classify them as benefiting either the medical applicants, or the industry as a whole. The CAA found that 52% of the services benefit (and therefore should be funded by) the applicants and 48% benefit (and therefore should be funded by) the industry users. This resulted in an application fee of \$183 excl. GST. This application fee would be charged to all applicants and would cover all the functions of the Medical Unit that are deemed to benefit the applicants.

In this report we review the CAA's classification of the services of the Medical Unit and find that three services (Accredited Medical Conclusions, assessment review and correspondence and review of cardiology assessments) included in the flat application fee do not benefit all applicants evenly. Instead they benefit the small subset of users who require these ancillary services. We therefore recommend that these services be funded through an hourly fee on the individuals who use these services and not through the universal flat application fee that is imposed on all applicants for medical certification, the great bulk of whom do not require these additional services. We also recommend that the CAA's unspecified costs relating to the medical certification process be recovered through the levy on the club of aviation users and not from the applicants. This is because these costs are associated with the general operation and existence of the Medical Unit which benefit the aviation industry as a whole. With these proposed changes the general medical application fee would drop to approximately \$70 (excl. GST).

The second aspect of this report focuses on the analysis presented in a recent report by the Ministry of Transport (MoT) on a proposed aviation fuel levy. In its report the MoT created theoretical operators with representative aircraft fleets within each sector of the aviation industry in New Zealand. This was done to present the likely costs that operators within the aviation industry would face under a fuel levy compared with the current and proposed CAA levies. This report focuses on two of these fleets: firstly, the fleet of a large domestic freight operator; and secondly, that of an

agricultural operator. Our focus is on how representative the hypothetical fleets are of their respective subsectors of the New Zealand aviation industry.

The large domestic freight operator fleet constructed in the MoT's analysis consists of 13 aircraft, 6 of which are large Boeing jet aircraft. This resulted in an approximate fuel levy cost to the operator of \$1.6m compared with freight and safety levies under the CAA's proposed regime of around \$200,000. The MoT's analysis indicates that a fuel levy may over-charge large freight operators. Our analysis, however, which is largely based on known freight operators and the New Zealand aircraft register, found it unlikely that a large domestic freight operator would have the fleet size assumed by the MoT. We found that while a fuel levy is likely to be costlier to a freight operator than the CAA's proposed regime, the difference between the two funding approaches would probably not be as large as presented by the MoT's report.

The agricultural fleet presented in the MoT's report consisted of 3 helicopters. It seems that this theoretical operator is assumed to spend approximately half its time in agricultural and half in other commercial operations. The MoT's analysis suggests that a representative agricultural operator would pay approximately twice as much under a fuel levy as it would under the CAA's proposed levies. The figures we obtained from two actual agricultural operators in New Zealand – Ravensdown Aerowork Ltd and Phoenix Aviation Ltd - indicated these two operators would pay more under the CAA's proposed levies than under a fuel levy. Our findings suggest the MoT should reassess its analysis of the implications of a fuel levy on large domestic freight and agricultural operators in New Zealand.

## **2. Introduction**

TDB Advisory has been engaged by the New Zealand Aviation Federation (NZAF) to conduct an independent review of two specific aspects of the CAA's triennial funding review.

This report has been developed in two sections that are both aimed at further understanding and addressing concerns raised during the CAA's triennial funding review. The first addresses the question of how the CAA should charge for its services around medical certifications. The second considers specific aspects of the proposal for a fuel levy in New Zealand as a possible replacement to current levy schemes. As requested by the AOPA and NZAF, our analysis focuses on the MoT's calculations of the costs a fuel levy would impose on typical large domestic freight and agricultural aviation operators in New Zealand.

## **3. Funding of the Medical Unit**

### **3.1 Background**

In New Zealand for a pilot to be considered "current" (that is, legally allowed to fly), one item he/she must hold is a current medical certificate. These medical certificates are issued by a medical examiner (ME) and they are issued if and only if it is deemed that an applicant is fit and able as defined under the Civil Aviation Rules (CAR) Part 67 and prescribed General Directions issued by the Director of the CAA under section 27G of the Act. A medical certificate is valid for between 6 and 60 months depending on the level of medical (one example is there are different requirements for a private pilot

and a commercial pilot) and the age of the applicant in question.<sup>1</sup> The Medical Unit within the CAA has the overall function of overseeing and regulating the MEs and the medical certification process.

To date the cost of the Medical Unit within the CAA has been borne by the pilots who have applied for medical certificates. Currently each applicant must fill out an 'Application for Medical Certificate' form which comes with a preliminary medical application fee (currently \$272 excl. GST). This cost was calculated in 2012 as the approximate operating cost of the Medical Unit (\$2.2m) divided by the approximate number of medicals that are applied for in a given year (8,000).<sup>2</sup> The fee is flat and covers the entirety of the funding required by the Medical Unit on an expected cost-recovery basis.

Cost-recovery funding approaches (such as that used by the CAA's Medical Unit) typically aim at raising funds from the participants or groups that benefit from the good or services provided on a 'user pays' basis. In NZ aviation the groups who benefit consist of:

- pilots, who gain employment or personal utility from recreational aviation use;
- consumers, being patrons of aviation; and
- the general public, who receive less direct benefits from having the option available and gain possible benefits from consumption by others (being family, friends or colleagues).

The current approach to recovering the Medical Unit's costs is that the pilot applying for a medical covers the cost they impose on the Medical Unit. This is consistent with treating the medical certificate as a 'private good' and charging for this private good through a universal flat fee to all users: ie, a good whose only beneficiary is the direct user (in this case the individual pilot) and all users consume the same amount of the good.

During the course of the 2016-2019 funding review for the CAA it has been proposed that a pilot's medical certificate is not solely a private good and that it has some benefit to the aviation industry as a whole. On this argument, the services that the CAA's Medical Unit provides should be partially funded through a levy to the "club" of participants (being ultimately the consumers of aviation) and possibly – but less likely – the public through taxation. The funding review has proposed that 48% of the Medical Unit should be considered a 'club good' and therefore funded by industry participants and not the pilot applying. This results in the proposed application fee for the medical certificate being \$183 excl. GST.

## **3.2 Overview**

In our subsequent analysis we take the CAA's proposed split of the Medical Unit's services between club goods and private goods as given and focus on the appropriate basis for charging for the private goods.

We first outline the funding objective for the CAA and the Treasury's guidelines for regulatory funding. We then present an analysis of the current CAA proposal for charging for the private-good component

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<sup>1</sup> According to CAR part 67.61.

<sup>2</sup> CAA Funding Business Case, 11 July 2012.

of the Medical Unit, taking into account the Treasury guidelines. We then present the funding approach that best:

- maintains the CAA's goal of cost recovery; and
- ensures an equitable, efficient and sustainable outcome for users.

To do this, the current functions of the Medical Unit are presented and separated into the functions that the CAA has deemed appropriate to be funded by the applicants (deemed to be private goods), and which have been deemed appropriate to be funded by the club of aviation users through a levy. Our analysis of the charging for private goods concludes that if a CAA function benefits all applicants equally then a flat application fee to all applicants is appropriate. However, if a function only benefits a small proportion of applicants, and it is not excessively costly to charge individual users, the expense should not be recouped through a fee to the entire group of applicants but rather funded through an hourly fee (as is done in by other functions of the CAA such as surveillance). We identify three such functions:

1. Accredited medical conclusions, which are required when further medical investigation is needed for a specific applicant to pass (approximately 10% of all applicants require this);
2. Assessment review and correspondence, which relates to a specific ME corresponding with the CAA about a specific applicant; and
3. Review of cardiology assessments, which relates to reviewing simple bloodwork for a specific applicant in the event that it is needed.

Our analysis of the club goods largely agrees with the determinations of the CAA with the exception of administration and miscellaneous costs associated with the Medical Unit's existence which should be considered club goods and not private.

It is therefore recommended that the cost of the three private goods identified above be removed from the application fee, and the miscellaneous administration expense be funded through the club good component (therefore also removing it from the application fee calculation). With these changes, we estimate that the cost of the medical application would be reduced from \$183 to approximately \$70 excl. GST. In our view this fee would represent a more efficient and equitable charging regime.

### **3.3 Medical pricing and the CAA's Medical Unit**

#### **3.3.1 Funding objective for the CAA's Medical Unit**

The CAA aims to fund its regulatory functions through fees and levies that promote safety and security within the aviation industry, encourage industry participation to compete, invest and innovate, and are practical and stable over time.<sup>3</sup> The CAA notes that these objectives involve trade-offs and there is a need for ongoing rebalancing of revenue sources between different parts of the aviation sector in order to achieve best outcomes given the government's policy objectives.

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<sup>3</sup> P4, CAA Discussion Document on the Funding Framework for Regulatory Services, 2106-18.

Consistent with the cost-recovery funding approach to government-provided goods and services we distinguish between three types of goods or services: “public goods”; “club goods”; and “private goods”. Each good or service type carries with it a different cost recovery/funding approach as the impacts of the goods differ in terms of who they are attributable to, who carries the risk and therefore who should ‘foot the bill’.

The NZ Treasury defines a **public good** as:

*“[having] the property that excluding people from its benefits is either difficult or costly, and its use by one person does not detract from its use by another.”*

In other words, a public good is one that is non-excludable (it is hard or impossible to stop others from consuming) and non-rivalrous (otherwise known as non-subtractable, where one person’s consumption does not impact someone else’s). A public park and a public fireworks display are instances of public goods. Public goods are best funded through a tax or levy on the entire community as everyone has the option to consume the good.

A **club good** is defined as:

*“[having] the property that people can be excluded from its benefits at low cost, but its use by one person does not detract from its use by another.”*

That is, a club good is a good that is excludable but non-rivalrous. Club goods are best funded through a levy on the group of people who have access to the good as these are the people who consume or have the option of consuming the good.

Finally, the definition of a **private good** is:

*“[having] the property that people can be excluded from its benefits at low cost, and its use by one person conflicts with its use by another.”*

A private good is a good that is excludable and rivalrous: ie, a good that only the direct user benefits from. A private good is best funded through a fee-for-service as there is a direct beneficiary of the good or service. There are a number of ways in which this fee-for-service can be charged. For instance, there can be a universal fee to all beneficiaries. This is preferred when all who privately benefit from the good or service receive the same level of benefit. Alternatively, this can be on an hourly basis to the individual that is directly benefiting from the good or service. There are equity and efficiency implications for each charging practice given the specific private good or service.

### **3.3.2 CAA’s public, club and private split**

According to the CAA, its Medical Unit’s activities can be split into 22 functions. The CAA estimates that these functions account for 13,217 hours of work per year (6.35 annual full time equivalents). The CAA has proposed that not all of these hours are spent creating private goods, therefore the total costs should not be completely recouped from the applicants through the application fee (as is currently the case). Having a pilot that has been medically accredited through a system with strong checks and balances has benefit to the users of aviation services. For instance, passengers on a commercial flight are consuming a club good (it’s excludable – a passenger has to pay for their ticket – but for the most part non-rivalrous). They receive some benefit in knowing that their pilot has been medically approved to fly the aircraft that they are on by a well-maintained and reliable system. At the same time that pilot receives some benefit as he/she is able to fly.



Table 1 presents the 22 functions of the Medical Unit and the hours spent on each function. This gives a representative weighting of each function's presence within the Medical Unit.

**Table 1: Current CAA split**

Service Code	Service Code Description	Total hours	Club hours	Private hours
132	Medical Certification-Unspecified	1,706	256	1,450
133	Medical Certification - Routine - Data capture	2,364	237	2,127
134	Medical certification - AMC	2,555	1,277.5	1,277.5
135	Provision of client information to Medical Examiners	465		465
136	Review existing audit protocols and establish guidelines for external audit programme	3	3	
137	Establish monitoring programme for MEs including on-site visits and reviews	11		11
141	Personnel licensing general advice to clients & industry	1		1
142	Medical Suspension, Revocation, Cancellation	1,631	1,631	
143	Assessment Review and Correspondence	1,127		1,127
144	Training and Appointment of Medical Examiners	483	483	
145	Responding to requests from certificate holders & general public	897	897	
150	Maintain quarterly contact with CASA to discuss and review standard between countries	143	143	
160	Safety investigation - accidents	7	7	
174	Develop and Maintain the Medical Manual	283	283	
175	Convener	149	149	
401	Review of cardiology assessments	378		378
405	Meetings and Interviews by industry sector	6	6	
948	Processing of chargeable external exemption applications	1		1
1107	Managing the Medical Examiner Programme	25	25	
1125	Develop & Maintain General Directions	63	63	
1173	Digitisation of medical assessments and documents	669	669	
	Other direct activity included in o/h codes (travel, conferences, etc.)	150	150	
		<b>13,117</b>	<b>6,280</b>	<b>6,838</b>
			<b>48%</b>	<b>52%</b>

Table 1 also provides the CAA's classification of each function between club good and private good. The CAA proposes that 48% of the Medical Unit's costs be classed as club goods and therefore be recouped through an industry-based levy and 52% as private goods, recovered from the individual through a medical application fee. This fee must be paid regardless of whether the applicant passes or fails their assessment.

Currently the CAA has recommended that the price of the medical application fee be set at \$183 excl. GST. This estimate is based on an approximate total operating Medical Unit cost of \$2.284m, an expected number of annual medical applications of 6,500<sup>4</sup> and the 48/52 split mentioned above. That is,

$$Fee = \frac{Cost * \% Private Good}{\sim No. Medicals}$$

<sup>4</sup> Appendix 1 presents an analysis of the assumed number of medicals and concludes that 6,500 is an appropriate estimate.

which is,

$$\frac{\$2.2875m * 0.52}{6,500} = \$183$$

As shown above, the way in which the application fee is calculated groups all private goods together. All private costs are lumped into one application fee that is distributed evenly across all users. This is equitable and efficient if the benefits of the good are evenly distributed across all those who receive it. However, if this is not the case there are allocative and dynamic efficiency problems because the service is mispriced.

### 3.4 Pricing and the application fee

As presented in Table 1, the 22 functions of the Medical Unit are classified by the CAA as either club or private goods. The specified club goods are:

1. provision of client information to medical examiners;
2. review existing audit protocols and establish guidelines for external audit programme;
3. medical suspension, revocation, cancellation;
4. responding to requests from certificate holders & general public;
5. maintain quarterly contact with CASA to discuss and review standard between countries;
6. safety investigation – accidents;
7. develop and maintain the medical manual;
8. convenor;
9. meetings and interviews by industry sector;
10. managing the medical examiner programme;
11. develop & maintain general directions;
12. digitisation of medical assessments and documents; and
13. other direct activity included in o/h codes (travel, conferences).

The functions specified by the CAA as being private goods are:

1. provision of client information to medical examiners;
2. establish monitoring programme for MEs including on-site visits and review of selected MEs;
3. personnel licensing general advice to clients & industry;
4. assessment review and correspondence;
5. review of cardiology assessments; and
6. processing of chargeable external exemption applications.

Lastly, the functions that are split by the CAA between club and private are:

1. Medical Certification – unspecified, 15/85 club/private split;
2. Medical Certification – routine data capture, 10/90 club/private split; and
3. Medical certification – accredited medical conclusion, 50/50 club/private split.

In most cases we agree with the CAA's categorisation of its functions. However, as is discussed in the next subsection the method of charging for three of the private goods should be reconsidered and certain costs currently classified as private should in fact be classified as club goods.

### **3.5 Detailed analysis of specifically identified goods**

This subsection focuses on four of the 22 functions of the Medical Unit. We discuss the possibility that that three of the functions (accredited medical conclusions, assessment review and correspondence and review of cardiology assessments) do not benefit all the applicants but only benefit individual applicants. This raises the possibility that the group of applicants is cross-subsidising the individuals who require the three functions. The costs associated with the three functions arise because the specific applicant requires them (and they benefit the direct user). More equitable and efficient outcomes are reached when the costs are not recouped as part of a flat general application fee but rather are recouped through an hourly fee.

The fourth good (unspecified medical certification costs) that is analysed relates largely to the administrative and miscellaneous functions of the Medical Unit. These costs benefit the club as a whole and hence should be borne by all users, unless they are specifically attributable to individual users. Therefore, it is proposed that these unspecified costs should be classified as club goods and recouped through a levy on aviation users and not directly from the applicant.

#### **3.5.1 Accredited Medical Conclusion (AMC)**

The first function of the Medical Unit assessed in more detail is the function that relates to accredited medical conclusions (AMCs). The AMCs account for approximately 19% (2,555 hours) of the Medical Unit's time.

An AMC is recommended following a medical examination if the medical examiner (ME) cannot reach a definitive conclusion on the applicant's ability to fly safely. In this case the specific applicant is referred on and further, more specialised tests, may be required. The application is passed back to the CAA Medical Unit which then assesses the claim and either:

1. passes the application back to the ME in question to make a ruling (meaning that the Medical Unit assessor does not see extra testing to be necessary and the ME should make a final ruling); or
2. the assessor in the Medical Unit sees the need for further testing and requires the applicant to undertake further testing, and there are appeal procedures following this if the pilot disagrees with the outcome.

Historically, approximately 10% of medicals opened (applied for) require an AMC in some form.<sup>5</sup> As outlined in Table 1, the CAA has deemed that an AMC should be treated as 50% funded by levy and 50% as private, with the private portion paid through the flat application fee.

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<sup>5</sup> CAA figures report that from 2012 to 2016 to date 9.98% of medicals require an AMC to be opened on average each year with a maximum of 10.2% and a minimum of 9.7%.

Effectively the application fee (paid by all medical applicants) includes a portion that covers the fees in the event an applicant is required to undertake an AMC. This can be looked at as the group of private beneficiaries covering the cost of a relatively few private beneficiaries within that group. The CAA specifies that “the AMC process provides individual case consideration for applicants who do not meet the medical standards”.<sup>6</sup> This is an example of cross-subsidisation among the group of private beneficiaries. Effectively at the point of an AMC, the applicant has failed the initial medical evaluation and the applicant has the option to walk away from the process entirely. Therefore, it is sensible that the AMC be charged on an hourly basis and not included in the application fee.

There may however be plausible reasons why an AMC should stay as part of the general uniform application fee. Firstly, if the fees associated with an AMC are high (considering only the fees relevant to the CAA’s function and not the fees that the applicant will be facing from the doctor themselves) then this may induce undue pressure on the ME from the applicant to not recommend an AMC in borderline situations.

In our view, if there is pressure on MEs to pass borderline cases and not recommend an AMC, this pressure will already be occurring under the current system. If there is a disproportionately high increase in total fees for a borderline case this could become a concern. However, an hourly fee is incremental (ie, will not cause large one-off fee surprises for the user). Furthermore, most borderline cases will be generally settled easily and therefore not require a large additional cost to the individual applicant through the hourly basis of the charging for the private goods.

Secondly, introducing an hourly fee increases administration costs as the private user will need to be billed directly by the CAA and records will need to be kept. In some cases, the increase in transaction costs may be material as an agency may have to start up an entirely new billing and record keeping department. This can be costly if the function does not already exist. In the case of the CAA, however, this function is already set up through the surveillance and auditing functions of the CAA. There may be a cost associated with upscaling this function, however, the total cost of increased administration and monitoring does not seem to be a systemic factor in why the AMCs cannot be paid for on an hourly basis by the direct beneficiary.

One risk of having an hourly fee is that if the application ends up being declined there may be credit risk for the CAA. However, this is the same for the doctors who make the rulings and this issue has not been raised by any MEs therefore it can be assumed that this risk is either low or the non-payers are so few that it does not make a large difference to the bottom line.

In summary, there are, some potential down sides to an hourly fee approach to the AMCs, such as increased administration costs. However, those extra costs would be recouped from the individuals who are requiring the service, therefore little or no additional financial burden would be placed on the CAA. Also, there may be an increased risk of default from applicants. However, the MEs hold the same risk currently and it does not appear to be a major problem that has arisen during consultations. It is therefore reasonable to conclude that the costs and risks associated with an hourly fee approach

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<sup>6</sup> Page 18 of The CAA’s “Medical Examiners’ – Medical Manual, Part 2 – The Medical Certification System”.

for AMCs are outweighed by the benefits associated with the equity and efficiency gains that can be made by applying it.

### **3.5.2    *Assessment review and correspondence***

The second function of the Medical Unit addressed in more detail is the function that relates to assessment correspondence. This function accounts for approximately 8.5% (1,127 hours) of the Medical Unit's time and has been classified by the CAA as a good that should be paid for by all beneficiaries of the private good and hence be covered in the cost of the initial application fee.

Similar to the AMCs, it seems likely that this service is not used by the entire group of applicants that are being assessed. That is, an ME does not need to confer with the Medical Unit on every application. If it did the percentage of time taken up would be much higher. Therefore, it appears that this is also a case where participants funding the goods as a group are subsidising the individual assessments where the ME has to seek further advice.

It should be noted however that the CAA (which holds the greatest knowledge) considers this function to be important and does not want to dis-incentivise its use. At times, clarification is necessary and, if not available, could result in extra fees to the applicant through a costlier AMC. The CAA's position on this matter seems to be one of simplicity and accessibility on this front, where an ME can get in contact without having to concern themselves with extra billing and reporting. In our view this is valid reasoning. However, it does not change the fact that that applicants are funding a portion of the Medical Unit where a few are using more resources than others. Again this is cross-subsidisation and is not consistent with general user-pays and cost-recovery principles.

### **3.5.3    *Review of cardiology assessments***

The review of cardiology assessments function accounts for approximately 2.9% (378 hours) of the Medical Unit's time. Similar to the assessment review and correspondence function detailed above, this function relates to situations where there are reviews of cases where it may not be necessary for a complete AMC to be opened, for instance reviewing results of simple blood work. It therefore seems logical that if it is deemed the assessment review and correspondence category (discussed above) should not be charged to all applicants through the flat application fee and is actually through an hourly rate, then it should follow that the review of cardiology assessments should also be viewed this way.

### **3.5.4    *Unspecified***

Lastly, we consider a function of the Medical Unit that appears ambiguous: "unspecified". Classifying a portion of a business unit's time as unspecified is not uncommon. However, in this situation the unspecified unit accounts for 12.9% of the Medical Unit's time (1,706 hours) which warrants further investigation. Also the CAA has deemed that this "unspecified" use of the Medical Unit's time should be split into 15% club and 85% private. This is a quite specific split and it is our opinion that more granulated information is needed in order to understand what is club good, what is private-group good (which should be attached to the application fee) and what should be a private-user charge. The CAA has reported that these charges are largely administrative and the 15/85 split comes from what is generally related to the medical certification process (excluding the AMC process). Our analysis in

the next section puts aside the need for more data and analyses the data we have in order to classify the unspecified function of the Medical Unit.

### 3.6 Proposed reclassification of services

This section of the report presents the pricing implications of reclassifying certain functions of the CAA as analysed in the previous section. Table 2 presents the proposed changes.<sup>7</sup> These proposed changes more closely align pricing of the CAA's functions with the Treasury's guidelines and generally accepted economic principles.

**Table 2: Proposed changes**

Proposal	1	2	3	4
Accredited medical conclusion	no change	50/50, prvt-hr/club	50/50, prvt-hr/club	50/50, prvt-hr/club
Assessment review and correspondence	no change	no change	private hourly charge	private hourly charge
Review of cardiology assessments	no change	no change	private hourly charge	private hourly charge
Unspecified	no change	no change	no change	club
%club	47.9%	47.9%	47.9%	58.9%
% private application	52.1%	42.4%	30.9%	19.9%
% private hourly	0.0%	9.7%	21.2%	21.2%
<b>Application fee excl. GST</b>	<b>\$183</b>	<b>\$149</b>	<b>\$109</b>	<b>\$70</b>

#### 3.6.1 Proposal 1: no change to current CAA recommendations

The first proposal in Table 2 presents (as a baseline) the club/private split as currently proposed by the CAA, with the application fee remaining at \$183 excl. GST.

#### 3.6.2 Proposal 2: private-club portion of the AMC is treated as a private-user good

Proposal 2 takes the 50% of the AMC hours specified as private (1,127.5) by the CAA and removes them from the application fee calculation. The individual that requires the service will cover the CAA's costs associated with the service through an hourly rate. This is similar to much of the CAA's surveillance funding. Excluding the AMC cost decreases the estimated private component of the of the Medical Unit's funding through the application fee to 42% and increases the estimated variable cost of the remaining private cost to 10%. This results in the general application fee charged to approximately \$149 excl. GST.

#### 3.6.3 Proposal 3: AMC and special review charges reclassified to be private-user goods

As detailed in the previous subsection, as well as the AMC, the assessment review and correspondence and the review of cardiology assessments can be viewed as being private goods that are appropriately charged through an hourly fee and not a flat fee. Proposal 3 presented in Table 2 details the outcome if the AMC and the two special review charges are not included in the application fee and therefore charged on an hourly fee basis. If this were the case, then the private component for the Medical Unit's funding recouped through the application fee falls to approximately 31%, the estimated private component of the Medical Unit's funding recouped through hourly fees increases to approximately 21%. This results the application fee for a medical being \$109 excl. GST.

<sup>7</sup> Appendix 2 presents a detailed breakdown of the cost-allocation and charging implications of the proposals.

### **3.6.4    *Proposal 4: all functions discussed are removed from the application fee***

Lastly we consider a scenario where not only the AMC and other related speciality review costs are borne by the direct beneficiary, but also the unspecified costs are funded through a levy and not applied to the application fee.

Any unspecified or miscellaneous charges are considered to be a cost of business for the Medical Unit and therefore a club goods that are necessary for the existence of a Medical Unit. Further to this, the breakdown of the functions of the Medical Unit provided by the CAA (containing 22 individual hourly expense departments) seems to cover all applicable costs that a pilot should need to cover. Therefore, again, the remainder of the operating cost of the Medical Unit should be borne by the club that is benefiting from its existence, being in this case the club good which will be funded ultimately through levies to the industry.

Distributing the Medical Unit's costs in this way result in funding from public-club being around 59% and private being 41%. Of this 41%, 20% would be recouped through an application fee to all applicants and (an estimated) 21% from an hourly rate. This would make the appropriate application fee around \$70 excl. GST.

## **3.7       Recommendations**

The adoption of proposal 4 is recommended. It is our opinion that the AMC costs should not be paid for evenly by private users, many of whom will never require it themselves. Given this it is also our opinion that the related review services should also be charged on an hourly user pays basis. This is because these services are not supplied by the CAA to the majority of private users. In addition, the unspecified administrative costs are for the good of the club as they are a cost of doing business. If the existence of the Medical Unit is considered a club good (which we propose that it is), then these costs should be recouped through an industry levy.

## **3.8       Practicality of recommended changes**

The practicality and sustainability of the funding mechanism needs to be carefully considered as having an operating CAA is necessary for a stable, reliable and internationally recognised New Zealand aviation sector. Therefore, we must ensure that the funding structure we propose is consistent with the CAA operating as a feasible going concern.

In our discussion above, we considered two challenges to the recommended proposals. Firstly, transaction costs will be greater and there will be increases in administrative costs within the CAA relating to billing and record keeping. However, the CAA has a long history of direct billing for its surveillance capacity.

Secondly, there would be some additional risk of non-payment from users. This risk in our view is low and is not considered pivotal in the decision.

## **3.9       Stakeholder support for the proposed changes**

The CAA has carried out two consultations and is, at the time of writing this report, in the final stage of a third. The first consultation was a series of seminars around the country where CAA delegates

met with stakeholders from different regions in New Zealand.<sup>8</sup> During these seminars there was support for a greater split of costs within the medical certification.<sup>9</sup> This support, however, did not specify the detail that we are now proposing. The support was for a general change to the status-quo to incorporate a club-private split and not the two-stage pricing that has been recommended in this report.

These seminars with stakeholders led to the CAA issuing a discussion document<sup>10</sup> that outlined proposed changes and a second consultation process. During this consultation, stakeholders were asked:

“Should the CAA introduce a two-stage fee for medical certification in which:

1. the applicant pays a fee for their initial application. If their certificate is granted straight away, then that will be the only fee paid?
2. the applicant will also pay an additional charge representative of the incremental cost of an Accredited Medical Conclusion (AMC) process only if that is required? Do you agree that cost recovery from medical applicants should only cover only the costs of managing and carrying out the oversight of the medical certification process? This will mean levy funding will cover the other Medical Unit costs which are not related to supporting the application process.”

That is, essentially what this report is proposing was asked directly to the key stakeholders. Of the 62 who responded, 42 agreed (~68%), 6 substantially agreed (~10%), 5 partially agreed (~8%) and 9 disagreed (~14%). This shows that there is strong support for the use of a two-stage medical pricing mechanism.

### **3.10 Medical funding concluding remarks**

In summary, TDB recommends that the allocation of costs within the Medical Unit by the CAA be altered. Currently the CAA splits the functions of its Medical Unit into club goods (being goods that benefit all users of aviation products), and private goods that benefit the individual applicants who are charged a uniform application fee.

The CAA’s proposed charging scheme has its advantages in that it reduces transaction and monitoring costs by grouping all costs together. However, this treatment does not promote allocative or dynamic economic efficiency. It charges the general users more than the cost they impose on the system (assuming they do not require an AMC or further review) which may slow the growth rate of applications unnecessarily. The current charging system is also inequitable in our view as the general user is paying for the costs imposed by the small group of applicants who require an AMC or other review. Hence, we recommend that the costs associated with the AMC and related review functions

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<sup>8</sup> According to the CAA’s “Summary of issues raised at seminars” document, seminars were held between 6<sup>th</sup> and the 15<sup>th</sup> August 2014. There were two seminars in each of Nelson, Christchurch, Queenstown, Auckland, Palmerston North and Wellington, and there were over 170 attendees.

<sup>9</sup> Bullet 2 page 3, “Summary of issues raised at seminars”.

<sup>10</sup> “Funding framework for regulatory services 2015-18”



which do not benefit the all private beneficiaries be charged on an hourly fee basis to the direct beneficiary.

Further to this, goods that are not defined and have a large general administrative purpose should be treated as a general cost of business that contributes to the existence of the Medical Unit. These general costs should therefore be treated as a club good and should be recouped through a levy.

Given these conclusions, this report recommends that the Medical Unit should be funded approximately 59% through a levy, approximately 20% by a medical application fee and approximately 21% funded on an hourly fee basis. This would result in the application fee for a medical being around \$70 excl. GST.

## 4. Aviation fuel levy

This section of the report considers two specific aspects of the analysis by the Ministry of Transport (MoT) about the potential of funding the CAA through an aviation fuel levy. The two specific aspects we consider are the implications of a fuel levy on:

- large domestic freight operators; and
- agricultural operators.

The possibility of imposing a fuel levy was proposed by AOPA and reviewed by the MoT in the report titled “Analysis of an Aviation Fuel Levy 2015”.<sup>11</sup> The MoT concluded that a fuel levy should not be adopted in New Zealand.

Our report does not address the general question of the appropriateness of a fuel levy for New Zealand. We focus solely on the estimates by the MoT of the implications of a fuel levy for large freight carriers and agricultural operators in New Zealand.

The MoT’s analysis presents a case study of (presumably representative) notional fleets within the different industries operating in the aviation sector in New Zealand (ie crop dusting, air freight, passenger airlines, skydiving, recreational users and charters). Figure 1 presents a table taken directly from the MoT’s report. The table presents the notional fleets created for the MoT’s analysis. From these notional fleets, historical flight data was reportedly analysed to estimate hours flown and fuel burnt by each fleet. These estimates were used to compare what each notional fleet would contribute to the CAA under a fuel levy compared with their contributions under the system of levies and fees proposed by the CAA.

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<sup>11</sup> For ease of reference we refer to the joint CAA/MoT analysis and report as the MoT’s analysis/report.

Figure 1: MoT's estimates of notional fleets

Operator type	Number of aircraft	Annual domestic hours flown	Annual fuel use (L)
Agricultural	3	958	111,845
Domestic airline	16	24,628	11,124,116
Large domestic freight	16	11,020	21,329,777
Freight – half domestic / half international	12	4909	5,736,890
Skydiving	1	777	149,251
Helicopters and small aeroplanes	4	591	64,522
Jet charter	1	56	41,471
Recreational user (50 hours)	1	50	1,100
Recreational user (200 hours)	1	200	8,000

The large domestic freight operator's notional fleet presented in Figure 1 is out of date. The CAA and MoT have seen fit to alter this fleet since the fuel levy analysis was carried out. Its fleet size has decreased from 16 to 13 aircraft and hours flown have decreased from 11,020 hours to 10,625 hours. No conclusions have been drastically affected by this change and, it is our understanding that the CAA and the MoT retain the overall conclusions presented in their fuel levy analysis.

## 4.1 Large domestic freight operators

### 4.1.1 Proposed notional fleet

As outlined in Table 3 below, the MoT's proposed notional freight fleet comprises: five Fairchild SA227-AC's; two Fokker F27 Mk 500's; three Boeing 737-3B7's; a Boeing 737-3S1; a Boeing 737-476; and a Boeing 737-4Q8. These 13 aircraft fly an estimated 10,625 hours per year and burn an estimated 21,209,972 litres of fuel per year. Furthermore, they fly an estimated 6,770 flights per year which means that each aircraft is flying an approximate average of 1.4 flights per day.

Table 3: MoT's notional domestic freight fleet

Aircraft	Freight hours flown 2013 (based on stat returns)	Fuel usage (L/hr)	Estimated fuel usage (L/yr.)	Number of freight flights 2013 (based on stat returns)	Payload (kgs) (based on reference)
1. Fairchild SA227-AC	452	320	144,531	270	2,540
2. Fairchild SA227-AC	362	320	115,949	373	2,540
3. Fairchild SA227-AC	530	320	169,680	581	2,540
4. Fairchild SA227-AC	547	320	174,995	587	2,540
5. Fairchild SA227-AC	232	320	74,394	178	2,540
6. Fokker B.V. F27 Mk 500	358	1,250	447,450	414	10,400
7. Fokker B.V. F27 Mk 501	546	1,250	682,962	608	10,400
8. Boeing 737-476	745	2,000	1,489,900	363	21,365
9. Boeing 737-3B7	742	3,125	2,317,188	603	21,365
10. Boeing 737-3B7	1,451	3,125	4,535,531	642	21,365
11. Boeing 737-3B7	1,655	2,000	3,309,580	769	21,365
12. Boeing 737-3S1	1,546	3,125	4,829,750	633	21,365
13. Boeing 737-4Q8	1,459	2,000	2,918,060	749	21,365
<b>Totals</b>	<b>10,625</b>	<b>19,475</b>	<b>21,209,970</b>	<b>6,770</b>	<b>161,690</b>

Table 4 on the next page presents the breakdown of the costs to a freight operator through firstly a fuel levy and secondly freight levy and safety levies (as proposed by the CAA).

#### 4.1.2 Calculated costs for freight vs. fuel levy

As calculated and agreed by the CAA/MoT and AOPA, a fuel levy would need to be 7.8 cents per litre of fuel sold, and this levy would only affect those flying domestically. Given this, the estimated cost to the notional freight operator (as depicted by Table 4) of a fuel levy would be approximately \$1.65m. Conversely, assuming an average utilisation rate of 60% for the freight operators, the levies proposed by the CAA – \$3 per tonne freight levy and the operator safety levy which is charged on aircraft weight category – would cost approximately \$202,000. The difference between these two calculations is striking (the fuel levy costs the user approximately 8.2 times more than the proposed CAA levies). In the subsection below we seek to better understand what is behind this large estimated difference.

**Table 4: Levy calculations as presented by the MoT**

		Fuel levy paid (\$0.078 per litre)	Freight levy (\$3 per tonne with assumed 60% capacity)	Operator safety levy (based on MCTOW weight class)	Total safety levy per aircraft (GST excl)
Aircraft					
1.	Fairchild SA227-AC	\$11,273	\$1,234	\$1,200	\$2,434
2.	Fairchild SA227-AC	\$9,044	\$1,705	\$1,200	\$2,905
3.	Fairchild SA227-AC	\$13,235	\$2,656	\$1,200	\$3,856
4.	Fairchild SA227-AC	\$13,650	\$2,684	\$1,200	\$3,884
5.	Fairchild SA227-AC	\$5,803	\$814	\$1,200	\$2,014
6.	Fokker B.V. F27 Mk 500	\$34,901	\$7,750	\$2,900	\$10,650
7.	Fokker B.V. F27 Mk 501	\$53,271	\$11,382	\$2,900	\$14,282
8.	Boeing 737-476	\$116,212	\$13,960	\$2,900	\$16,860
9.	Boeing 737-3B7	\$180,741	\$23,190	\$2,900	\$26,090
10.	Boeing 737-3B7	\$353,771	\$24,689	\$2,900	\$27,589
11.	Boeing 737-3B7	\$258,147	\$29,573	\$2,900	\$32,473
12.	Boeing 737-3S1	\$376,721	\$24,343	\$2,900	\$27,243
13.	Boeing 737-4Q8	\$227,609	\$28,804	\$2,900	\$31,704
<b>Totals</b>		<b>\$1,654,378</b>	<b>\$172,785</b>	<b>\$29,200</b>	<b>\$201,985</b>

#### 4.1.3 Freight operations in New Zealand: a sensitivity analysis

This report now considers how representative the MoT's notional fleet is of the New Zealand domestic air freight industry. This section presents three sensitivity analyses – firstly of the capacity assumed in the MoT's calculations; secondly, the average flight-times assumed by the MoT's analysis; and lastly the make-up of the fleet. This is followed by an overall consideration of the New Zealand freight industry and the representativeness of the proposed notional fleet.

##### 4.1.4 Scenario 1: demand fluctuations for air freight

A key assumption underlying the analysis of the MoT is the average capacity utilisation rate of the fleet. It is likely that the capacity utilisation rate will fluctuate over time with changes in demand driven by factors such as, the business cycle.

**Table 5: Capacity utilisation sensitivity**

<b>% capacity utilisation</b>	<b>Total payable freight levy</b>
60%	\$201,985
70%	\$230,783
90%	\$259,581
100%	\$317,176

Table 5 outlines the total levy paid by the notional freight operator under capacity utilisation rates ranging from 60% (as assumed by the CAA) to 100%. It shows that if the average utilised capacity for this specific notional operator increases from 60% to 100%, the levy cost to that operator would increase by 57% (from approximately \$115K) to approximately \$317K. This is relatively sensitive but is not comparable to the \$1.6m the operator would incur under a fuel levy. In this case it still appears a fuel levy would disproportionately tax large domestic freight operators.

#### **4.1.5 Scenario 2: flight times in New Zealand**

Table 6 presents a breakdown of the hours per flight of the MoT's notional fleet. This gives a good indication of the likely distance freight routes for each aircraft. Table 6 shows average flight time per aircraft is 1.5 hours. This is quite uninformative given that within the fleet there are both propeller and jet aircraft that might be operating routes over many parts of the country. However, when that is broken into sub-sets of the fleet, the average flight time of a given jet aircraft (of all the Boeing aircraft) jumps to approximately 2 hours. This seems high given that to our understanding the jet aircraft are limited by where they can fly due to runway and facility limitations at smaller airports. Also, logistically these aircraft have a greater payload and therefore will likely be used to fly into major hubs where their cargo can be more easily passed to land freight vessels to be distributed to surrounding areas.

**Table 6: Average flight times**

	<b>Aircraft</b>	<b>Freight hours flown 2013 (based on stat returns)</b>	<b>Number of freight flights</b>	<b>Average projected flight time per aircraft (hrs)</b>
			<b>2013 (based on stat returns)</b>	
1.	Fairchild SA227-AC	452	270	1.67
2.	Fairchild SA227-AC	362	373	0.97
3.	Fairchild SA227-AC	530	581	0.91
4.	Fairchild SA227-AC	547	587	0.93
5.	Fairchild SA227-AC	232	178	1.31
6.	Fokker B.V. F27 Mk 500	358	414	0.86
7.	Fokker B.V. F27 Mk 501	546	608	0.90
8.	Boeing 737-476	745	363	2.05
9.	Boeing 737-3B7	742	603	1.23
10.	Boeing 737-3B7	1451	642	2.26
11.	Boeing 737-3B7	1655	769	2.15
12.	Boeing 737-3S1	1546	633	2.44
13.	Boeing 737-4Q8	1459	749	1.95
<b>Averages</b>		<b>817</b>	<b>521</b>	<b>1.51</b>

It seems likely that the key routes of the Boeing aircraft within the fleet will be between Dunedin, Christchurch, Wellington and Auckland. Air New Zealand can carry a passenger direct from Dunedin

to Auckland in 1 hour 45 minutes.<sup>12</sup> If this is from Auckland to Christchurch this reduces to 1 hour 20 minutes. Wellington to Dunedin, gate to gate, takes approximately 1 hour 15 minutes, and all other flights between these hubs can be done in approximately an hour or less. With these (albeit passenger) comparables, the two hour estimates for the Boeing aircraft seem quantitatively high. Given this, if we half the Boeing fleets' hours – making the average flight time 1 hour – the total fleets' fuel levy costs decrease to approximately \$900,000. This reduces the ratio of the fuel levy costs to the freight and operations levies costs from 8.2 times to approximately 4.4. This shows a high sensitivity of the fuel levy cost to the assumed flight time and also the aircraft type. It appears the large jet aircraft have a larger impact in cost under a fuel levy than propeller driven aircraft.

This may indicate that larger operations that involve jet aircraft may be harmed financially more by the fuel levy than smaller ones. Alternatively, it may indicate that larger operations that have the capital and demand to run large jet aircraft are extracting benefits not available to smaller operations through the freight levy merely through the scale of their operation. However, the real dollar cost to a user of the notional fleet remains high.

#### **4.1.6 Scenario 3: fleet selection**

Motivated by the high sensitivity of aircraft type to cost incurred under a fuel levy this study now compares two new notional fleets derived directly from the MoT's notional fleet. Consider two extreme cases. The first is that of a large operator that only runs large freight aircraft such as the six Boeing 737s in the MoT's fleet. Secondly, a smaller operation that only contains the five propeller-driven Fairchild aircraft in the MoT's fleet.

Firstly, if just the Boeing fleet is considered (assuming again the high notional flight times), the six aircraft are expected to burn 19.4m litres of fuel in a given year. This results in a fuel levy cost of approximately \$1.5m. Conversely (again assuming the 60% capacity demand) the freight and safety levies would cost the operator approximately \$162,000. This is a multiple of 9.3, the highest that has been seen in the analysis.

If the fleet of propeller-driven Fairchild aircraft are considered (again working from the MoT's assumptions) the fuel levy cost is around \$53,000 and the freight and safety levies are around \$15,000. This decreases the multiple to approximately 3.5 (the smallest that has been seen by the analysis) but has also highlighted that the high dollar costs to operators is much less likely for smaller operators.

#### **4.1.7 New Zealand air freight industry and likely fleet construction**

The analysis thus far has focused heavily on the MoT's construction of a notional fleet with the understanding that the MoT has better access to sensitive company flight data. We now aim to assess how likely the MoT's fleet is in the actual NZ freight industry.

An interesting aspect of air freight within New Zealand is that there appears to be very few large operators that actually own fleet. For instance, according to the New Zealand aircraft register, NZ Post does not directly own any aircraft. The same is true for Mainfreight, DHL and any others that have large scale domestic operations within New Zealand. This may be an artificial conclusion as most of

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<sup>12</sup> This is on an Airbus A320 which has a reasonably comparative cruising speed as a Boeing 737-300 aircraft.

these large logistics firms have operations that are centered around larger international hubs and therefore have aircraft (that possibly fly to and within New Zealand) that are registered outside of New Zealand. However, that makes them not a true domestic operator. In fact, there only seem to be two firms that have aircraft registered in their name for the purpose of freight. The first and largest is AirWork Flight Operations Limited (owned by AirWork Holdings) and the second is NZ Air Freight Limited (owned by Freightways).

According to the CAA aircraft register, AirWork has under its name eight large jet aircraft and seven propeller aircraft.<sup>13</sup> This make-up is similar to the MoT's notional fleet with a mix of propeller and jet driven aircraft. However, after reviewing Airwork's annual reports it seems that (while relatively comparable to the MoT fleet) Airwork leases space on their aircraft to many freight operators, much of which will be intermingled. The annual reports also show they lease aircraft to firms, and of their fleet they own passenger aircraft, medical aircraft and freight aircraft. Lastly, their annual reports indicate they have operations in New Zealand and Australia, and it also reports a different fleet construction, 13 jet aircraft fitted for freight and 8 propeller aircraft.<sup>14</sup> Of the non-jet aircraft they are reported to own, it is not specified which are equipped for freight and which are not, also it is not clear where each of these aircraft operate. There is reference to non-freight sectors and also no reference to leasing agreements of the business as a whole. Therefore, it is not clear which of these aircraft are utilised for freight and by who.

These inconsistencies and uncertainties about the fleet make it difficult to determine: firstly, which aircraft operate within New Zealand and which are used for freight; and secondly, which aircraft have been leased or loaned to other freight firms. Therefore, it seems unlikely that Airwork would be a typical domestic operator and so it is possible a notional built to represent a New Zealand operation should not have a similar fleet make-up as them.

The second operator, NZ Air Freight Ltd. is owned by the umbrella corporation Freightways. According to their website Freightways also owns all the companies outlined in Figure 2. Some of the companies that operate under this umbrella that likely utilise aircraft in their operation include (but may not be limited to) New Zealand Couriers, Post Haste, Pass the Parcel, Castle Parcels, Now Couriers, Kiwi Express, Air Freight NZ Cargo, DX Mail and Fieldair.

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<sup>13</sup> Four Boeing 737-400s, four 737-300s, two Fokkers, four Fairchilds and one Jetstream 32 aircraft

<sup>14</sup> Five 737-300s (four equipped for freight), twelve 737-400 (nine equipped for freight), two Jetstream 32s, 2 Fokker F27-500s, three Fairchild SA227s and one Piper Chieftain.

Figure 2: Freightways Group



According to the CAA aircraft register, the NZ Air Freight fleet consists of three Jetstream 3200 series aircraft. This propeller driven aircraft has an approximate payload of half a larger Boeing represented in the notional fleet.<sup>15</sup> Also, NZ Air Freight has five Convair type aircraft (large propeller aircraft with a payload of over two times that of the Fairchild).<sup>16</sup> This fleet, unlike the notional fleet with small propeller aircraft and large jet aircraft, contains all propeller driven aircraft. The effect on the cost to the operator with a fuel levy versus freight and safety levies would likely be more similar to that of the fleet constructed with all propeller driven aircraft fleet in the previous section. However, this cannot be concluded with certainty due to lack of information on the aircraft fuel usage and Freightways sales and transport data. That means it is likely companies operating within Freightways would still pay more under a fuel levy than freight and safety levies however the dollar cost will likely not be close to that of the MoT's fleet.

In our view the MoT needs to readdress the idea of a typical 'domestic freight operator'. This needs to be considered because it seems that neither AirWork Flight Operations Ltd. nor NZ Air Freight Ltd. are in fact freight operators. They appear to be aircraft operators that lease space to the firms under their umbrella corporations. This means that neither of these companies would pay any of either levy and the increased cost would be passed directly on. Therefore, if we assume that the NZ Air Freight fleet is committed to the deliveries of the nine companies (which are all major operations in NZ and specified above) that require air freight on a usual basis, the typical domestic operator looks a lot smaller. Consider the eight aircraft registered to NZ Air Freight and divide that by the nine actual freight firms (that would bear the cost of any levy) who rent space on an aircraft it seems unlikely that any freight operator would get close to the \$1.6m proposed for the notional fleet. It is therefore our contention that the notional fleet is not representative of a typical NZ freight operation and a new analysis needs to be done in order to better understand what the actual trade-off would be.

<sup>15</sup> Information accesses from [http://www.brikoair.com/charters/jet\\_stream\\_3200/jet\\_stream\\_3200.html](http://www.brikoair.com/charters/jet_stream_3200/jet_stream_3200.html).

<sup>16</sup> Information accessed from <http://www.airliners.net/aircraft-data/stats.main?id=169>.



It should be noted, that our analysis has been based on publicly available information on the current aircraft register obtained from the CAA's website. If this register is out of date or inaccurate in some way, our analysis may be misguided. Furthermore, there is always the possibility that there are other large freight operations that have their aircraft registered under names that we are not aware of, in which case our analysis may suffer from missing variable bias and therefore our conclusions may present only one side. Also, the CAA has said that the fleet has been somewhat estimated from records of freight flight logs (that contain company sensitive information, and therefore are unavailable for our analysis). So, the notional fleet may be more representative than we are unaware of. Lastly, there may be cases that we are unaware of where, for instance, an Australian aircraft is operating in NZ and only NZ that the CAA is aware of but we are not.

#### **4.1.8 Freight operations in New Zealand: concluding remarks**

This section has carried out a robustness test on the analysis of the domestic freight operator calculations presented by the MoT. We have seen that, given the MoT's assumed notional fleet, in every case tested a fuel levy would cause a freight operator to pay more than it would be required to under freight and safety levies. It has also demonstrated the importance of the fleet construction, when large jet aircraft are considered the gap between the fuel and freight levies increases which raises possible equity questions of the freight levy with in a user-pays framework.

Following this sensitivity analysis, the air freight industry within New Zealand was examined more closely. It appears that the make-up of the notional fleet was similar to that of a company called AirWork. However, what is not clear with this company was which aircraft are passenger aircraft and which are freight. Also the fleet reported in their parent company's annual report differed from that of its NZ registered aircraft. This indicated that some of its operations are in NZ and some are in Australia, and presumably much travel between. Also, there are indications that the company does not just operate but also enter lease and loan agreements with other freight and passenger operators. Looking more closely at the aircraft register, another air freight company was found which has a completely different fleet composition and seems to supply aircraft services to many leading retail freight firms in the country (retail freight being the bulk of air freight in NZ). This leads to the conclusion that the notional fleet constructed may be removed from a typical 'large domestic air freight operator' in NZ.

While the sensitivity analysis indicated that even for smaller operations the fuel levy will cost the operator approximately 3 to 4 times that of the freight levy it is highly unlikely that this cost will get close to the \$1.6m estimate of the MoT's analysis because the notional fleet is unrealistic within the NZ air freight market. Therefore, the MoT's analysis should be reconsidered using more representative figures (possibly based on the Freightways numbers) as suggested by this report.

## **4.2 Agricultural operators**

This section assesses the MoT's analysis of agricultural operators and the implications of a fuel levy. Our analysis is based on data obtained from two actual agricultural operators in New Zealand, Ravensdown Aerowork Limited (based in Wanganui) and Phoenix Aviation Limited (based in Gore). Given we are only using a sample of two operators it is unlikely we are presenting a complete picture of the agricultural operations sector. However, our analysis provides an indication of the representativeness of the notional fleet presented by the MoT in its analysis.



Our analysis suggests the MoT's notional agricultural fleet may operate partly in the agricultural sector and partly in other commercial aviation sectors. We find the figures obtained directly from the two agricultural operators which conflict with the estimates presented by the MoT's notional case. While not assuming to present a conclusive consensus of the industry we question the construction and representativeness of the MoT's fleet.

#### 4.2.1 Background

The CAA proposes that agricultural aviation operators contribute to funding the CAA through three levies and fees:

1. an operations safety levy;
2. an operator safety levy; and
3. an aircraft registration fee.

The operations safety levy consists of a charge of \$0.87 per tonne of product dropped by the operator. The operator safety levy (which is currently enacted) is a flat fee based on the maximum certified take-off weight (MCTOW) of each aircraft in the fleet. Lastly, the operator must pay an annual fee of annual registration fee of \$84.15 (excl. GST) per aircraft.

The proposed fuel levy remains at \$0.078 per litre of fuel used by the operator, consistent with the analysis of AOPA and the MoT.

#### 4.2.2 The MoT's estimation

Table 7 presents the make-up of the MoT's notional fleet for a hypothetical agricultural operator. This operation involves three aircraft (all helicopters), two classed as light (between 1,000-2,730 kg) and one classed as very light (<1000 kg). In a breakdown of the MoT's calculations for the costs incurred by this notional operator, it appears that this operator is not solely an agricultural operator. Assuming we have interpreted this correctly, approximately 50% of its business involves agricultural operations and 50% involves other commercial activity that operates under Part 135 Category D.<sup>17</sup> This assumption means the analysis of the MoT is not based on an agricultural operator but a business that undertakes many different functions within the aviation industry. However, it is possible that this fleet is representative of the agricultural sector.

**Table 7: MoT's notional agricultural fleet**

	Annual flight time	Annual tonnage	No. aircraft	Fuel burn
MoT	958	1,592	3	111,845

Table 7 and the breakdown of the MoT's levy calculations indicate that the notional fleet is burning approximately 116 litres of fuel per hour and dropping approximately three tonnes of product per agricultural flying hour used.

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<sup>17</sup> Part 135 Category D applies to all commercial activity involving small sized aircraft and charges operators \$6.50 per flight hour with the exception of freight-only operations, passenger operations that have more than 20,000 passengers per year and presumably agriculture operations.

Based on the assumptions from Table 7 (and the multi sector business model assumed for the fleet), Table 8 presents the most recent calculations of the CAA for the notional agricultural/other commercial operating fleet.

**Table 8: Implications for the notional operator**

	Operations safety levy	Operator safety levy	Annual registration fee	Total - CAA proposed	Fuel levy
MoT	\$4,219	\$270	\$252	\$4,742	\$8,724

Table 8 shows that the notional operator will have to pay around \$5,000 to the CAA under the CAA's proposed levy regime. Under a fuel levy this cost would almost double to approximately \$9,000.

#### **4.2.3 Ravensdown Aerowork Limited**

Ravensdown Aerowork Limited is an agricultural aviation company based in Wanganui. It has supplied us with the number of aircraft that it operates and its best estimates of total flight time, annual tonnage and fuel burn (as presented in Table 9).

**Table 9: Aerowork's agricultural fleet**

	Annual flight time	Annual tonnage	No. aircraft	Fuel burn
Aerowork	7,246	164,712	14	1,449,267

Unlike the MoT's notional fleet, majority of Aerowork's fleet are fixed wing aircraft rather than helicopters. This is represented in Table 9 in that Aerowork burns approximately 200 litres per hour and drops 22 tonnes per hour. That is, it burns more fuel and has a higher product drop rate.<sup>18</sup>

**Table 10: Implications of the different levies for Aerowork's cost comparison**

	Operations safety levy	Operator safety levy	Annual registration fee	Total - CAA proposed	Fuel levy
Aerowork	\$143,300	\$18,000	\$1,262	\$162,562	\$113,043

Table 10 outlines the cost that would be imposed on Aerowork under the CAA's proposed levies and fees, versus the fuel levy. It reaches the opposite conclusion to that reached by the MoT for its notional fleet. In the case of Aerowork, it will incur approximately \$162,000 in levies through the CAA scheme and approximately \$113,000 in levies under a fuel levy.<sup>19</sup>

#### **4.2.4 Phoenix Aviation Limited**

Phoenix Aviation Limited is an agricultural aviation company based in Gore. Like Aerowork it has supplied us with its total flight time, annual tonnage and fuel burn, all of which are presented in Table 11.<sup>20</sup>

<sup>18</sup> These numbers are based on the averages of the last three years.

<sup>19</sup> We have assumed Aerowork on average operates "medium" MTOW for the operator safety levy calculation however this has not been confirmed. Changing this is relatively inconsequential to the findings.

<sup>20</sup> Phoenix also supplied us with their product mix and drop rate. They can apply approximately 2.5 tonnes of selenium over 6.5 hours but can apply 40 tonnes of lime per hour. While analysis of what is being dropped and the associated cost and charges is out of scope for this report, there may be future considerations that are needed for effectively pricing the value of the operation and not just volume dropped. This may be captured in a fuel or an hourly levy and more work is needed to assess the efficiency and equity arguments of each.

**Table 11: Phoenix's aviation fleet**

	Annual flight time	Annual tonnage	No. aircraft	Fuel burn
Phoenix	1,300	20,000	3	240,000

Table 11 indicates that Phoenix Aviation is a smaller operation than Aerowork. It burns approximately 184 litres per hour and drops approximately 15 tonnes per hour. Table 12 presents the implications of the different levies.

**Table 12: Implications of the different levies for Phoenix's cost comparison**

	Operations safety levy	Operator safety levy	Annual registration fee	Total - CAA proposed	Fuel levy
Phoenix	\$17,400	\$3,600	\$252	\$21,252	\$18,720

As with Aerowork, Table 12 shows the cost incurred to Phoenix under the CAA's proposed are likely to be higher than that under a fuel levy (~\$21,000 compared with ~\$19,000).<sup>18</sup>

#### 4.2.5 Summary

The MoT has estimated that the notional fleet operators in the agricultural sector would have to pay almost twice as much under a fuel levy as under the CAA levies. This would be a significance increase and would be concerning to operators in the agriculture sector. The MoT's notional fleet however is based on a small helicopter operation that operates across several sectors of the aviation industry. Conversely, our estimates based on two actual agricultural operators indicate the two operators are likely to be better off under a fuel levy. This difference in conclusion is concerning and raises questions about the robustness of the MoT's notional fleet. We recommend that the notional fleet is reconsidered and a consensus is found of a representative New Zealand agricultural operation from which robust recommendations can be made.

## 5. Conclusions

This report analyses certain aspects of proposals that have arisen during the CAA's triennial funding review. The report analyses the funding structure of the CAA's Medical Unit which provides and regulates the medical certification process. Our analysis concludes that by applying the Treasury's guidelines for cost-recovery regulatory funding, the application fee for a medical certificate for a pilot should decrease from \$183 excl. GST to around \$70 excl GST. In addition, two aspects of the analysis carried out by the MoT of the proposal for an aviation fuel levy are considered. Our review concludes that the MoT should reassess its analysis, and in particular it should reassess the aircraft fleets it assumes in its analyses of a typical large domestic freight operator and a typical agricultural operator.

## Appendix 1: Assessment of the number of medicals

The assumption of the number of medicals issued per year is crucial to the calculation of the application price. The CAA has estimated the number of medicals issued at 6,500 per year, if this were to increase to 7,400 (the approximate number of medicals applied for in 2014, which is the year that the CAA is using as a benchmark for the club/private split presented in table 1 above) the application fee would fall to approximately \$161 excl. GST, a full 12% decrease in price to the user. This makes the number of applications an important aspect for the calculation of the application fee. If it is underestimated the CAA will set a price that is too high and overcharge the user unjustly and increase the likelihood that the fee acts as a deterrent to those who may be considering applying or renewing their medical. If it is overestimated however, a price that is too low will be charged and the CAA will not recover costs. To investigate this further, table 2 outlines the CAA's records of the number of medicals issued for the years that are currently available.

**Table 13: Medicals issued**

	2012	2013	2014	2015	2016 (to date)
Number of medicals opened	7,391	7,138	7,378	7,001	1,069

The CAA has reportedly applied the estimated medicals (at 6,500) as a prudent level given the 5.11% decline from 2014-2015. This estimate however may seem slightly overly prudent given that the average over the last four years is 7,227, and that previous decreases have been followed by increases (2012-2013's decrease was followed by an almost perfectly offsetting increase in 2013-2014) implying that there is some possible short term mean-reversion in the data.<sup>21</sup> However, there are far too few observations to make any hard conclusions about the stochastic nature of the number of medicals opened in a given year.

To further assess this question of how appropriate the 6,500 medicals assumed is, first we will take the year to date medicals and assume that they are the total medicals for the complete first two months of 2016. This means that all else equal assuming a linear stream of medical applications throughout the year, 2016 is on track to open approximately 6,414 medicals.<sup>22</sup> This number is merely a rough estimate and is not conclusive, however it does show a possible continued decrease in the medicals opened (meaning applied for). Therefore, it is sensible to look slightly further at the problem.

**Table 14: Forecast medical applications opened**

	2016F	2017F	2018F	2019F
Number of medicals opened	6,880	6,762	6,645	6,531

The average percentage change over the last four full years is -1.72%. Given this table 3 presents a forecast of the expected number of medical applications from now until the next funding review. Again there are not enough observations to conclude that the -1.72% is a reasonable and persistent growth rate through time, however it does give an indication of expected future outcomes (which

<sup>21</sup> 3.42% decrease from 2012-2013 followed by a 3.36% increase from 2013-2014.

<sup>22</sup> Calculated as  $6,414 = (\frac{1069}{2})12$ . This estimate is thought to be artificially low as February 2106 is not quite finished at the time of this analysis. Also, more detailed time-series data is not available so it is not possible to see if there are historically better months etc. so conclusions cannot be reached given this estimate.

here given the higher negative weighting toward more recent years may be optimistic). The simple (possibly optimistic) forecast presented in table 3 therefore gives approximately 6,500 medical applications by 2019 which will be when the next funding review is proposed to start again.

It can therefore be concluded that the 6,500 medical applications are a reasonable assumption to use going forward for the application price calculation for a cost recovery funding approach.

## Appendix 2: Breakdowns of proposals

Table 15: Proposal 2 breakdown, user pays AMC

Proposal 2: AMC charged on hourly basis					
Service Code	Service Code Description	Hrs	Club	Private application	Private hourly
132	Medical Certification-Unspecified	1,706	256	1,450	
133	Medical Certification - Routine - Data capture	2,364	237	2,127	
134	Medical certification - AMC	2,555	1,277.5		1,277.5
135	Provision of client information to Medical Examiners	465		465	
136	Review existing audit protocols and establish guidelines for external audit programme	3	3		
137	Establish monitoring programme for MEs including on-site visits and reviews	11		11	
141	Personnel licensing general advice to clients & industry	1		1	
142	Medical Suspension, Revocation, Cancellation	1,631	1,631		
143	Assessment Review and Correspondence	1,127		1,127	
144	Training and Appointment of Medical Examiners	483	483		
145	Responding to requests from certificate holders & general public	897	897		
150	Maintain quarterly contact with CASA to discuss and review standard between countries	143	143		
160	Safety investigation - accidents	7	7		
174	Develop and Maintain the Medical Manual	283	283		
175	Convener	149	149		
401	Review of cardiology assessments	378		378	
405	Meetings and Interviews by industry sector	6	6		
948	Processing of chargeable external exemption applications	1		1	
1107	Managing the Medical Examiner Programme	25	25		
1125	Develop & Maintain General Directions	63	63		
1173	Digitisation of medical assessments and documents	669	669		
	Other direct activity included in o/h codes (travel, conferences, etc.)	150	150		
		<b>13,117</b>	<b>6,279.5</b>	<b>5,560</b>	<b>1,277.5</b>
			<b>48%</b>	<b>42%</b>	<b>10%</b>

Table 16: Proposal 3 breakdown, user pays AMC and related extras

Proposal 3: User pays AMC and associated costs					
Service Code	Service Code Description	Hrs	Club	Private application	Private hourly
132	Medical Certification-Unspecified	1,706	256	1,450	
133	Medical Certification - Routine - Data capture	2,364	237	2,127	
134	Medical certification - AMC	2,555	1,277.5		1,277.5
135	Provision of client information to Medical Examiners	465		465	
136	Review existing audit protocols and establish guidelines for external audit programme	3	3		
137	Establish monitoring programme for MEs including on-site visits and reviews	11		11	
141	Personnel licensing general advice to clients & industry	1		1	
142	Medical Suspension, Revocation, Cancellation	1,631	1,631		
143	Assessment Review and Correspondence	1,127			1,127
144	Training and Appointment of Medical Examiners	483	483		
145	Responding to requests from certificate holders & general public	897	897		
150	Maintain quarterly contact with CASA to discuss and review standard between countries	143	143		
160	Safety investigation - accidents	7	7		
174	Develop and Maintain the Medical Manual	283	283		
175	Convener	149	149		
401	Review of cardiology assessments	378			378
405	Meetings and Interviews by industry sector	6	6		
948	Processing of chargeable external exemption applications	1		1	
1107	Managing the Medical Examiner Programme	25	25		
1125	Develop & Maintain General Directions	63	63		
1173	Digitisation of medical assessments and documents	669	669		
	Other direct activity included in o/h codes (travel, conferences, etc.)	150	150		
		<b>13,117</b>	<b>6,280</b>	<b>4,055</b>	<b>2,783</b>
			<b>48%</b>	<b>31%</b>	<b>21%</b>

**Table 17: Proposal 4 breakdown, all functions discussed are removed from application fee**

Proposal 4: User pays AMC and associated costs completely private user					
Service Code	Service Code Description	Hrs	Club	Private application	Private hourly
132	Medical Certification-Unspecified	1,706	1,706		
133	Medical Certification - Routine - Data capture	2,364	237	2,127	
134	Medical certification - AMC	2,555	1,278		1,277.5
135	Provision of client information to Medical Examiners	465		465	
136	Review existing audit protocols and establish guidelines for external audit programme	3	3		
137	Establish monitoring programme for MEs including on-site visits and reviews	11		11	
141	Personnel licensing general advice to clients & industry	1		1	
142	Medical Suspension, Revocation, Cancellation	1,631	1,631		
143	Assessment Review and Correspondence	1,127			1,127
144	Training and Appointment of Medical Examiners	483	483		
145	Responding to requests from certificate holders & general public	897	897		
150	Maintain quarterly contact with CASA to discuss and review standard between countries	143	143		
160	Safety investigation - accidents	7	7		
174	Develop and Maintain the Medical Manual	283	283		
175	Convener	149	149		
401	Review of cardiology assessments	378			378
405	Meetings and Interviews by industry sector	6	6		
948	Processing of chargeable external exemption applications	1		1	
1107	Managing the Medical Examiner Programme	25	25		
1125	Develop & Maintain General Directions	63	63		
1173	Digitisation of medical assessments and documents	669	669		
	Other direct activity included in o/h codes (travel, conferences, etc.)	150	150		
		<b>13,117</b>	<b>7,730</b>	<b>2,605</b>	<b>2,783</b>
			<b>59%</b>	<b>20%</b>	<b>21%</b>