

ARE AIRLINE SERVICES TO DARWIN IN SYNCHRONY WITH THE DEMAND FOR SERVICES BY TOURISTS?

Grahame J.W. Webb
Wildlife Management International Pty. Limited
(Rev3; 20 November 2015)

INTRODUCTION: "THE PROBLEM"

In 2015, I know 5 people who missed flights back to Darwin from down south in the month of JULY.

When they tried to get back on the next available flight, but were quoted \$1800 to \$2500 for a one-way ticket. Obviously few remaining seats.

Eight years earlier, in JULY 2007, I tried at short notice to book 5 family members from Darwin to Sydney, when my father's health deteriorated rapidly.

I was quoted over \$2000 each for the only available tickets. So they drove down.

The reason this is important is that JULY is the peak of the tourist season in Darwin. It is the time that most tourists from around Australia want to visit Darwin. But the air capacity into and out of Darwin, in this peak month, which sees some 20% of annual tourists (interstate and international) visit, is very limited indeed.

How many more people would come to Darwin, during that peak of the tourist season, if there were more flights and cheaper airfares? If a group of people partying in Sydney decided impulsively to head to Darwin on the next weekend, to experience say the Darwin Cup, the cost would be prohibitive. Far cheaper and easier to party in Brisbane or Melbourne, or even head to Bali, Vietnam or Cambodia.

It raises the obvious question of whether the total monthly domestic airline capacity to Darwin is correlated with the tourist demand, and whether individual airlines scale their Darwin capacity to tourism demand better than others.

This reasonably brief and superficial look at the problem reveals some disturbing trends, and potentially highlights some important differences in the way individual airlines seem to operate.

ANALYSIS AND RESULTS

A. General Trends in Visitation

Tourist visitation at Crocodylus Park, one the largest tourist attractions in Darwin, has been monitored over 21 years, and provides a good index of tourism in general. It reflects “real tourists” – at the coal face - and is not confounded with people arriving for other purposes.

Data assembled a few years back (Figure 1; Table 1) with local, interstate and international visitors combined, shows the highly cyclic but stable nature of tourism trends. These stable, monthly visitation percentages (Table 1) have some predictive value: the level of visitation in most months can be predicted from the previous month. For example, if 4000 people visit in May (7.9%), then June (11.8%) visitation can be predicted at 5,975 visitors (ie $11.8/7.9 = 1.49$; $4000 \times 1.49 = 5975$).

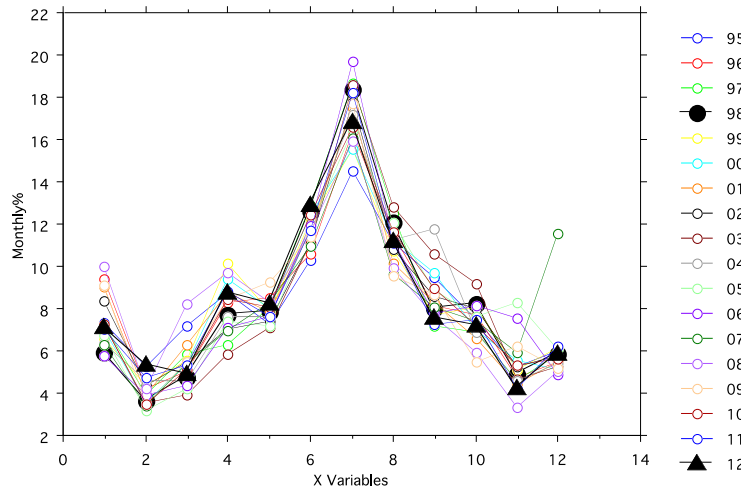


Figure 1. Percentage of annual visitors at Crocodylus Park that visit each month (1995 to 2012). Filled circles and triangles are for 1998 and 2012 respectively. Refer to all visitors (locals, interstate and international; around 35%, 55% and 10% respectively)

Table 1. Mean percentage monthly visitation levels over 15 years (1995 to 2010), excluding 2007, where visitation in December was very high due to marketing. "NS" indicates no statistically significant change in the monthly percentage over time (ie it is stable).

Month	Mean	SD	SE	Maximum	Minimum	Trend
January	7.6	1.3	0.34	5.8	10.0	NS
February	4.0	0.6	0.1	3.2	5.3	NS
March	5.4	1.1	0.3	3.9	8.2	NS
April	8.1	1.2	0.3	5.9	10.2	NS
May	7.9	0.6	0.1	7.1	9.2	NS
June	11.8	0.7	0.2	10.3	12.9	NS
July	17.1	1.4	0.4	14.6	19.7	NS
August	11.3	0.9	0.2	9.6	12.8	NS
September	8.8	1.2	0.3	7.2	11.8	NS
October	7.4	1.0	0.3	5.5	9.2	NS
November	5.3	1.2	0.3	3.4	8.3	NS
December	5.6	0.4	0.1	4.9	6.1	NS

However, when tested, predicting July visitation from June (and other months) was the least accurate. The most plausible explanation for this, over the years, was that although June visitation was a good indication of “demand”, July visitation was constrained by other factors. “Expense” was the most likely root cause, and there are two main candidates:

- a. Air travel costs and availability: and
- b. accommodation costs and availability.

With regard to air travel costs and availability, the general monthly visitation trends for all tourists (local, interstate, international)(Figure 1; Table 1) indicate that:

- a. 17.1 % of annual tourists come in one month (June), 42% in 3 months (June to August), and 65% within 6 months (April to September)
- b. From May to June there is a 49.4% increase in tourists visiting;
- c. From June to July there is a 44.9% increase in tourists visiting; and
- d. Together, from May to July, there is a 116.5% increase in tourists visiting.

These general trends are perhaps confounded by “local” tourists (that do not need to arrive by plane) being included, and perhaps by trends at Crocodylus Park not being representative.

To examine this more closely, over the 12 months period October 2014 to September 2015, only “interstate” and “international” visitors were included (ie. local visitors were excluded). During this period Crocodylus Park had increasing tourism, due to new attractions, but it was almost exclusively local tourists. So

the basic trends in "interstate" and "international" are a reasonable index (pending the acquisition and analysis of trends from other attractions).

B. Analysing Data for the 12 months October 2014 to September 2015 (Interstate and International visitors only)

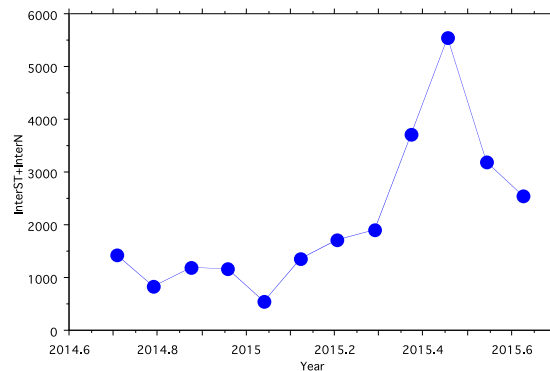


Figure 2. Combined interstate and international visitors per month at Crocodylus Park, for the 12 months October 2014 to September 2015

The data for Figure 2 are tabulated on Table 2, where they are compared with the general trends for all visitors, including locals (Figure 1; Table 1): the differences are due to trends in locals.

Table 2. Monthly percentage Visitation

Month	Figure 2	Figure 1 (Table 1)
October 2014	5.7%	7.4%
November 2014	3.3%	5.3%
December 2014	4.7%	5.6%
January 2015	4.7%	7.6%
February 2015	2.2%	4.0%
March 2015	5.4%	5.4%
April 2015	6.8%	8.1%
May 2015	7.6%	7.9%
June 2015	14.8%	11.8%
July 2015	22.1%	17.1%
August 2015	12.7%	11.3%
September 2015	10.1%	8.8%

These data indicate that for interstate and international visitors:

- 22.1 % of annual interstate and international tourists come in one month (June), 50% in 3 months (June to August), and 74% within 6 months (April to September)
- From May to June there is a 94.7% increase in tourists visiting;
- From June to July there is a 49.3% increase in tourists visiting; and

- d. Together, from May to July, there is a 190.8% increase in tourists visiting.

This is despite airline capacity being extremely limited, and expensive in July.

Notwithstanding that aircraft capacity is a mix of business, tourism and other reasons, this basic trend in tourism is not strongly represented in the pattern of monthly airline capacity into Darwin of four major domestic airlines providing services (Figure 3; Table 3).

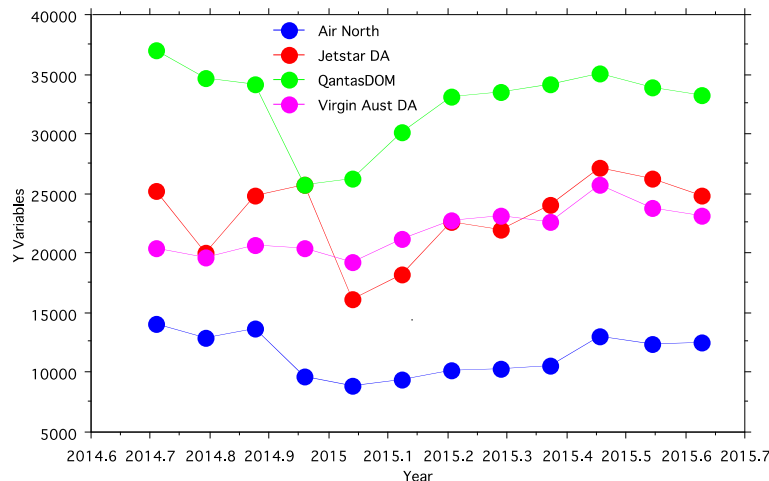


Figure 3. Monthly airline capacity for the major domestic airlines servicing Darwin for the 12 months October 2014 top September 2015

Table 3. Monthly airline capacity from October 2014 to September 2015

Month	AN	JET	QF	V	Total
October 2014	14092	25200	36980	20416	96688
November 2014	12856	19980	34628	19652	87116
December 2014	13658	24820	34121	20682	93281
January 2015	9664	25740	25732	20380	81516
February 2015	8910	16100	26208	19298	70516
March 2015	9364	18180	30100	21238	78882
April 2015	10224	22580	33152	22822	88778
May 2015	10308	22040	33516	23132	88996
June 2015	10620	24120	34104	22646	91490
July 2015	13077	27180	35112	25740	101109
August 2015	12372	26320	33936	23854	96482
September 2015	12568	24840	33264	23112	93784

When an index of total domestic airline capacity (the 4 sets of data combined) is examined (Figure 4) it is clear that, the lowest airline capacity was in February 2015, when tourism visitation levels were also the lowest (Table 2; 2.2%) and the highest in July, when tourism visitation was also maximised (Table 2; 22.1%).

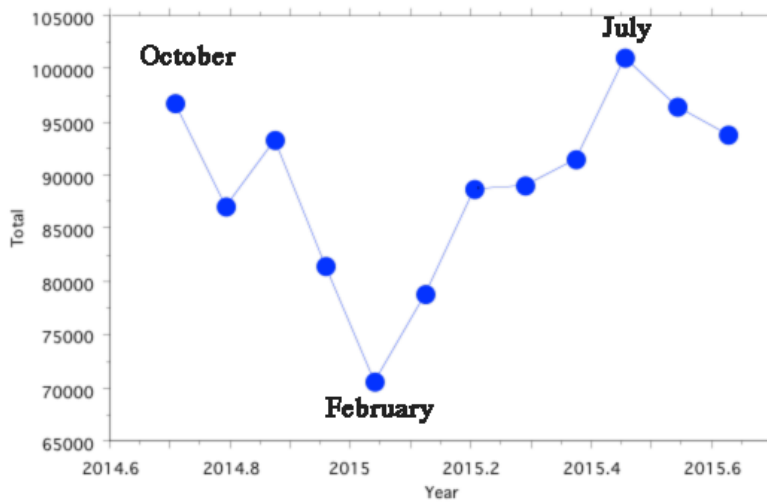


Figure 4. Total domestic airline capacity by month, from October 2014 to September 2015.

But the monthly pattern over the year was completely different (compare with Figure 2). The 10.1 times increase in interstate and international tourist visitation from February to July, was correlated with a 1.4 time increase in airline capacity. Indeed, airline capacity was almost as high in October 2014 (5.7% of tourists) as it was in July 2015 (22.1% of tourists).

Another way of looking at this is to scale both visitation and airline capacity to the lowest levels (February) and look at the monthly percentage changes (Figure 5): with airline capacity on an expanded scale in Figure 6 (raw data in Table 4)

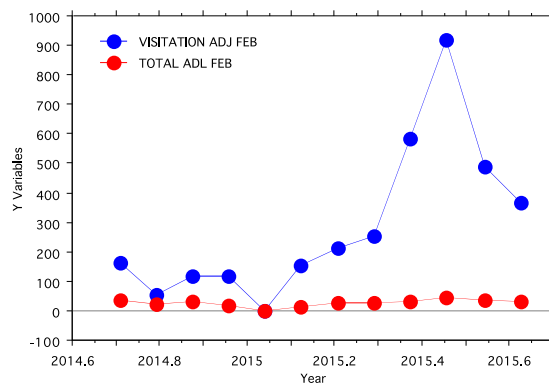


Figure 5. Percentage change in visitors (only interstate and international combined) and airline capacity per month, relative to February values (February = zero).

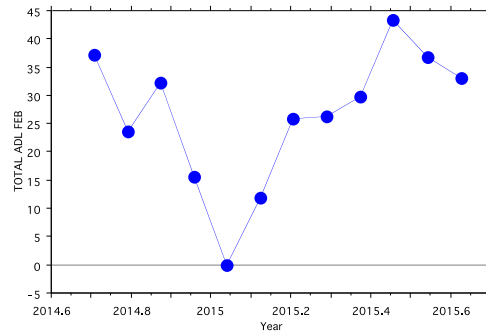


Figure 6. The monthly airline capacity, expressed as a percentage change relative to February (on Figure 5), presented on an expanded scale.

Table 4. Tabulated data for Figures 5 and 6; percentages relative to February (February = zero)

	Visitors % Change	Airline Capacity % Change
October 2014	161.4	37.1
November 2014	54.8	23.5
December 2014	118.0	32.3
January 2015	116.2	15.6
February 2015	0.0	0.0
March 2015	151.7	11.9
April 2015	214.5	25.9
May 2015	251.8	26.2
June 2015	582.4	29.7
July 2015	920.6	43.4
August 2015	487.3	36.8
September 2015	366.9	33.0

C. Total and Individual Airline Performance?

The “total” domestic airline capacity into Darwin (as calculated here) is significantly correlated with tourist visitation (Fig. 7; $p = 0.01$), but the relationship is highly variable. Total capacity fluctuates widely in months when tourism visitation is less than 6%, and seem reasonably stable when it ranges from 5% to 16%.

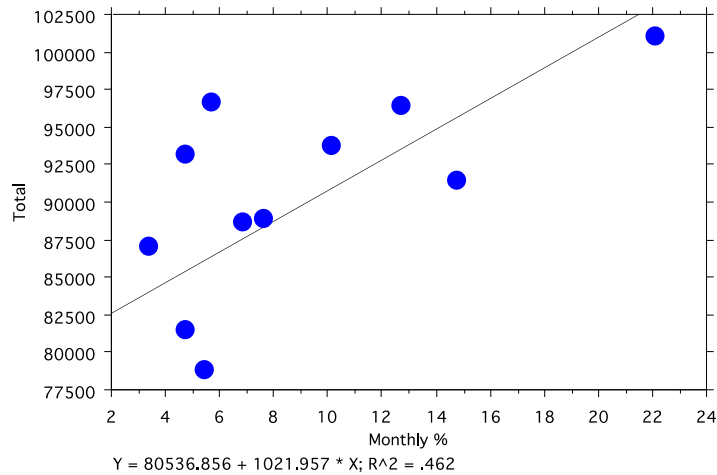


Figure 7. Correlation between total domestic airline capacity into Darwin per month and tourist visitation per month.

Yet this weak relationship is a compromise between some airlines having a high correlation between tourism demand and service, and others having no correlation.

a. Virgin

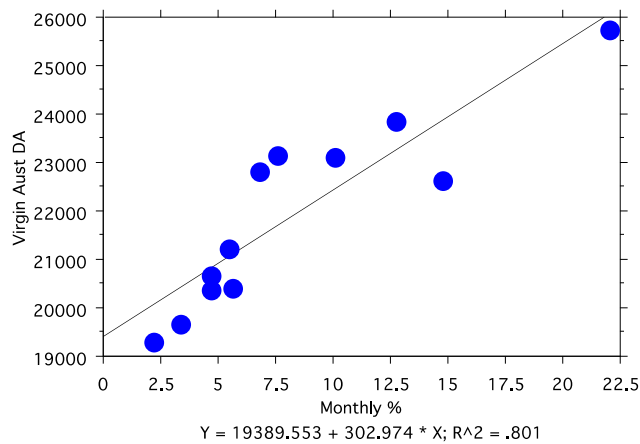


Figure 8. Virgin correlation between total domestic airline capacity into Darwin per month and tourist visitation.

The relationship between monthly airline capacity and tourism demand for Virgin is highly correlated (Figure 8; $p < 0.001$). Some 80% of the monthly changes in capacity can be attributed to monthly tourism demand. The general trends indicates:

- a. If tourism was zero, Virgin would still operate with a capacity of 19389 seats into Darwin per month.

- b. Capacity increases on Virgin by an average of 303 seats per month for every 1% increase in monthly tourism demand.

b. Jetstar

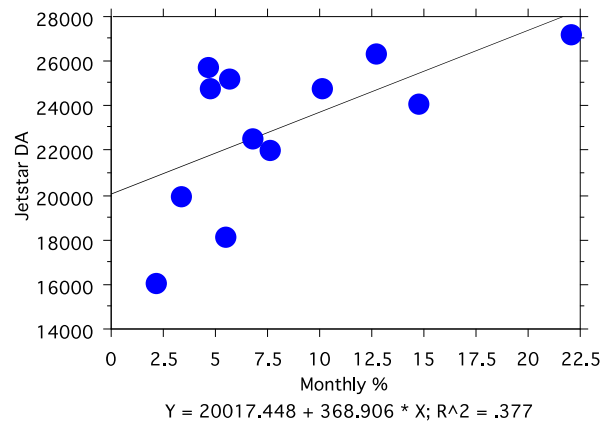


Figure 9. Jetstar correlation between total domestic airline capacity into Darwin per month and tourist visitation.

The relationship between monthly airline capacity and tourism demand for Jetstar is (Fig. 9; $p < 0.034$) is statistically significant ... but just. A curvilinear relationship (Fig. 10) explains more variation (45% versus 38%), but is not significant ($p=0.07$). The general trends are:

- The basic capacity is around 16,000 to 18,000 seats.
- It may increase sharply between 0% and 5-6% tourist visitation; and,
- Capacity tends to be maintained at a constant level, with a small rise in July, from around 5% to 22.5% visitation.

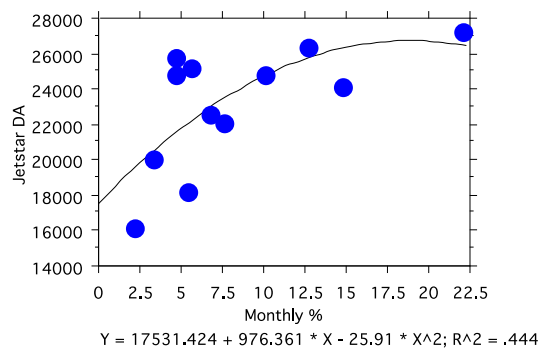


Figure 10. Acurvilinear relationship between total domestic airline capacity into Darwin per month and tourist visitation.

c. Qantas

There is no significant relationship between domestic capacity and tourism for Qantas (Fig. 11; $p=0.16$). Capacity is somewhat stable as tourism increases from about 6% to 22% per month, and fluctuates broadly when tourist visitation is less than 6-7%. When QF and Jetstar are combined, there is a significant result ($p = 0.035$) that is similar to the Jetstar relationship (Figs. 9 and 10).

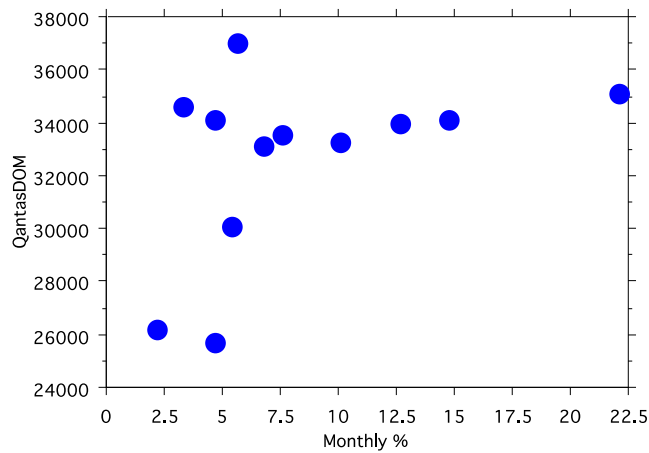


Figure 11. Qantas with no statistical correlation between total domestic airline capacity into Darwin per month and tourist visitation.

d. Air North

There is no significant relationship between capacity and tourism for Air North (Fig. 12; $p=0.38$), which services local areas. Monthly capacity is somewhat independent of trends in tourism: it is lower in the wet season than in the dry season (Table 3).

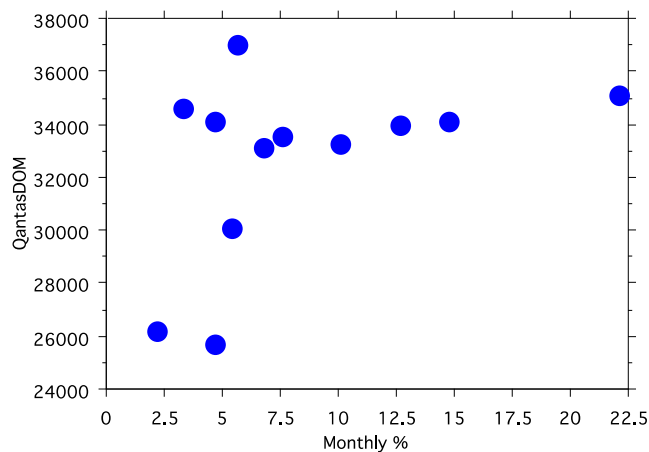


Figure 11. Air North with no statistical correlation between airline capacity into Darwin per month and tourist visitation.

DISCUSSION

These analyses are preliminary, but suggest that the monthly trends between total domestic airline capacity and tourism in Darwin, are not highly correlated. A 920.6% increase in interstate and international tourist visitation in July (relative to February) reflects demand (despite July visitation being constrained), and it is being serviced by a 43.4% increase in total airline capacity (relative to February) (Fig. 5).

Virgin is the one airline in which airline capacity to Darwin appears reasonably well-matched to the monthly tourism visitation trends. However, even here, the trend established outside the peak months is not continued into the peak months (June, July and August)(Figure 12).

In the months with less than 10% of tourism visitors, Virgin increases capacity by 579 seats for each 1% increase in tourist visitation demand. But when it gets to the peak period (June to August), it only increases capacity by 260 seats for each 1% increase in tourism. And indeed, in July, Virgin like all other airlines coming to Darwin, appear to be full to capacity.

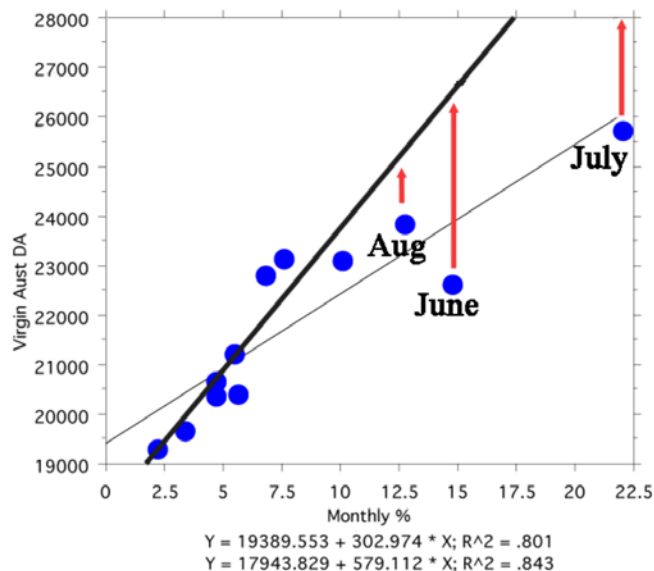


Figure 12. Virgin data (from Fig. 8), demonstrating the projected results from months with less than 10% visitation relative to the peak months.

Air North is not a major transporter of domestic tourists into Darwin from interstate, but for Jetstar and Qantas, in isolation and together, the

capacity into Darwin is not strongly correlated with tourism demand. Indeed, the capacity tends to stabilise during the peak months rather than increase with the increasing demand, with prices increasing, not decreasing. Not surprisingly ... there are no empty seats in July.

There are many potential ramifications of the findings here. For example, advertising the Top End as a holiday destination in the peak of the tourist season, when no flights are available, may not be so effective.

CONCLUSION

This analysis is a quick snapshot, to get some idea of how airline capacity is matched to tourism demand. It would clearly be strengthened if indices of tourism from other attractions were integrated.

That capacity is well below demand in the peak of the tourist season in the Top End, especially in July, when no seats are available and the prices for them are at a premium, is an inescapable conclusion.

Notwithstanding that the relationship between tourism visitation to Darwin and airline capacity is a highly complex one, and that the proportion of people carried in different months which are tourists vary relative to people travelling for other purposes, scaling to tourism during the peak months appears particularly limited for Jetstar and Qantas.

Virgin clearly has a different type of business plan, but even here, flights during the peak months are not enough ... the Virgin planes like all others are full in July. The superficial results (Figure 12) suggest Virgin could be increased by around 2000 seats in June, 5000+ in July and 1000 in August.

Tourism in the Top End will always been a “boom” and “bust” affair (Figs. 1 and 2), and so by constraining the “boom”, from June to August, in which 49.6% of annual interstate and international tourists visit the Top End, the airlines are truly doing the NT a great deal of economic harm. The case for revisiting this issue, in a more detailed analysis, would seem to be a very strong one indeed.
