

# The Impact of Aircraft Noise on Brisbane Residential Property Sectors: 1988-2016

## 2016 Brisbane Residential Property Investment Performance Update

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## Brisbane Airport Parallel Runway Project 2016 Update

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### 1. Introduction

The following Tables present the 2016 update for the various suburbs covered in the original 2013 analysis of the Brisbane residential property market. Again, this updated annual analysis compares the investment performance for a range of suburbs in Brisbane with varying affectation by aircraft noise, as well as suburbs that have no aircraft noise impact or could be subject to aircraft noise when the Brisbane's New Runway commences operations.

With the addition of the 2016 residential property sales transactions, the investment performance analysis now covers the years 1988 to 2016, a 29-year period. Over these twenty-nine years, the Brisbane residential property sector has been subject to periods of housing booms and recessions; therefore, the results reflect an accurate overview of the investment performance of each of the suburbs in the study.

This updated analysis covers the 36 suburbs classified as High Noise Complaints (HNC), Moderate Noise Complaints (MNC) and No Noise Complaints (NNC), and again the middle socioeconomic suburbs in the HNC locations are compared to the middle socio-economic suburbs in the MNC and NNC suburb locations.

Results are also updated for a residential home units/townhouses located in the 36 suburbs selected to give a snapshot of HNC, MNC and NNC suburbs.

In addition to the investment performance analysis based on suburb exposure to aircraft noise, the update also compares the investment performance for individual suburbs located under the current south and north flight paths, suburbs that will be potentially subject to flight paths when the new runway operations commence and suburbs that are currently not affected by aircraft noise and will remain so when the new runway opens. An additional suburb has been added to the previous analysis. This report also included Carindale for the period 1988 to 2016.

In all cases the analysis is based on both the annual median house price and the annual average house price for each of the suburbs analysed. The investment performance analysis comprises:

- 2016 capital return (median house price)
- 2016 capital return (average house price)
- 1988-2016 capital return (median house price)
- 1988-2016 capital return (average house price)
- 2016 capital return (median unit price)
- 2016 capital return (average unit price)
- 1988-2016 capital return (median unit price)
- 1988-2016 capital return (average unit price)
- Average annual volatility (median and average house and unit price)
- Risk/Return Ratio

The most significant result from the 2016 data was the better performance of houses in the High Noise Complaints (HNC) suburbs compared to the Moderate Noise Complaints (MNC) and No Noise Complaints (NNC) suburbs and the relatively poor returns for units across all suburbs. In 2016 the median house price for the HNC suburbs increased from \$675,000 to \$718,000, an annual percentage increase of 6.37, compared to 4.76% for the MNC suburbs and 5.61% for the NNC suburbs. Sales volume across all noise complaint classifications were less in 2016 compared to 2015. This 12 month reduction in sales volume ranged from -11.05% for the NNC suburbs to -10.05% for the MNC suburbs

The base data for the years 1988 to 2014 can be found in the full QUT/BAC report released in 2014, with the 2015 data update available in a separate report dated November 2016.

2 Suburb Comparison (High, Moderate and Minimal/No noise complaints)

Table 1 Capital Return and Investment Performance: Median Price 1988-2016

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
High Noise	6.37	8.50	9.00	1.06
Moderate Noise	4.76	8.78	8.85	1.01
No/Low Noise	5.61	7.43	8.18	1.10
Brisbane LGA	4.83	7.25	8.06	1.11

In 2015 the annual return for houses in the HNC suburbs was slightly lower compared to the 2015 capital return for the MNC and NNC suburbs. However, in 2016 the HNC suburbs have outperformed the other suburbs in the study. This has resulted in the long term (1988-2016) average annual return decreasing slightly from 8.57% to 8.50%. The fall in the long term investment performance for the MNC and NNC suburbs in 2016 has been 8.92% to 8.78% (MNC) and 7.51% to 7.43% (NNC). Again all noise comparison suburbs continue to outperform the Brisbane median house price for the full study period, however in 2016 the median house price capital growth for the MNC suburbs was less than the Brisbane house price return (4.76% MNC and 4.83% Brisbane).

Table 2 Capital Return and Investment Performance: Average Price 1988-2016

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
High Noise	8.03	8.58	9.24	1.08
Moderate Noise	3.86	8.40	9.93	1.18
No/Low Noise	4.90	7.24	8.35	1.15

The 2016 annual capital return for residential property in the HNC and NNC suburbs based on average prices was significantly higher for the HNC suburbs (8.03%). Across all groupings the annual return for 2016 was lower than the 2015 capital returns based on average house prices. This has resulted in a slight fall for the HNC suburbs for 1988 to 2016 (8.60% to 8.58%). The falls for the MNC and NNC suburbs was slightly higher due to the lower returns in 2016, with MNC long term average falling from 8.56% to 8.40% and NNC from 7.32% to 7.24%. The HNC suburbs have again recorded the highest average annual returns for the full study period. (Refer to Tables 1 and 2).

### 3 Suburb Comparison: Houses (High Noise Complaint Suburbs v Middle Socio Economic Suburbs)

**Table 3: Capital Return and Investment Performance: Median Price 1988-2016: HNC v Middle Socio-economic suburbs**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
High Noise Suburbs	6.37	8.50	9.00	1.07
Middle socio Economic Suburbs	5.30	8.17	9.12	1.12
Brisbane LGA	4.83	7.25	8.06	1.12

Table 3 shows that a similar result for 2016 to 2015 and the full 1988-2016 time period. Again the middle socio-economic suburbs in the HNC locations have shown a higher annual capital return in 2016 of 6.37% compared to a 2016 capital return of 5.30% for middle socio-economic suburbs in the MNC and NNC locations. This difference is still being reflected in the long term average annual capital returns (8.50% compared to 8.17%).

The middle value HNC suburbs have also shown a slightly lower volatility and a better risk return ratio compared to similar valued suburbs in the MNC and NNC locations. Table 4 shows that this trend has also continued when the HNC middle socio-economic suburbs are compared based on average annual house prices.

**Table 4: Capital Return and Investment Performance: Average Price 1988-2016: HNC v Middle Socio-economic suburbs**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
High Noise Suburbs	8.03	8.03	9.38	1.17
Middle socio Economic Suburbs	5.84	6.76	8.11	1.19

Table 5 shows the percentage difference between average annual house prices for the middle value HNC suburbs and the middle value MNC and NNC suburbs based on median and average house prices. This table shows that the trend of higher median and average house prices for the HNC suburbs has continued when compared to the two previous reports. The higher capital return for HNC houses in 2016 has now resulted in the average annual percentage difference from 1988 to 2016 being positive for both median and average house prices. In 2015, this figure was slightly negative based on average house prices. Based on the higher 2016 capital returns for the HNC suburbs this difference in average annual capital returns between the two suburb groupings has increased from an average of 2.42% (2015) per annum to 2.56% based on median house prices and 0.21% to 0.22% based on average prices.

**Table 5: Annual % Variation between HNC Suburbs and Middle Socio-economic suburbs: Median Price and Average Price: 1988-2016**

Year	Median Price Comparison (%)	Year	Average Price Comparison (%)
1988	-1.23	1988	-19.27
1989	3.06	1989	-12.88
1990	-2.54	1990	-10.79
1991	-6.92	1991	-8.90
1992	-3.70	1992	-4.76
1993	1.45	1993	3.40
1994	0.69	1994	2.55
1995	2.13	1995	0.00
1996	-6.00	1996	-11.05
1997	4.83	1997	3.73
1998	-4.91	1998	-5.46
1999	0.00	1999	-1.10
2000	7.27	2000	0.00
2001	7.50	2001	5.86
2002	7.69	2002	8.57
2003	6.81	2003	9.57
2004	3.54	2004	3.41
2005	3.51	2005	6.31
2006	2.50	2006	2.48
2007	7.37	2007	5.50
2008	3.70	2008	4.53
2009	1.89	2009	-2.46
2010	3.15	2010	2.54
2011	3.88	2011	2.52
2012	4.70	2012	2.00
2013	4.46	2013	2.04
2014	6.78	2014	6.22
2015	7.58	2015	9.38
2016	1.23	2016	2.41
<b>Average Annual Difference</b>	+2.56	<b>Average Annual Difference</b>	+0.22

**4 Suburb Comparison (High moderate and minimal/no noise complaints): Units**

**Table 6 Capital Return and Investment Performance: Median Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2015	Average Annual Volatility (%)	Risk return Ratio
<b>High Noise</b>	-1.10	6.33	8.20	1.30
<b>Moderate Noise</b>	0.00	5.75	6.39	1.11
<b>No/Low Noise</b>	0.00	6.23	9.56	1.53

Based on median prices, the units in the HNC suburbs have shown a negative return of -1.10% for 2016, with prices in the MNC and NNC suburbs showing no growth (nil capital return) for the same period. The zero or negative growth is more a function of the oversupply of units in Brisbane, particularly the inner city suburbs, rather than aircraft noise issues. The oversupply situation has a greater impact based on average unit prices, with Table 7 showing negative returns of 8.28% for HNC suburbs, 13.29% for MNC suburbs and a negative 5.83% for units in NNC suburbs

**Table 7 Capital Return and Investment Performance: Average Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
<b>High Noise</b>	-8.28	6.11	11.08	1.81
<b>Moderate Noise</b>	-13.29	5.59	7.59	1.36
<b>No/Low Noise</b>	-5.83	4.94	13.11	2.65

Units in the HNC suburbs still continue to outperform units in the MNC, NNC suburbs and the Brisbane median and average unit based on average annual capital returns. Although the capital return for HNC units in 2016 was again lower (compared to 2014 and 2015) than the MNC suburbs based on median price, this was not the case when the analysis is carried out with average unit prices, where only the units in the NNC suburbs outperformed the HNC suburbs.

## FLIGHT PATH COMPARISONS

### 5 Suburb Street Comparison: Southern Flight Path: Varying Distances

The following tables represent the investment performance for individual suburbs based on their location under and away from existing and proposed aircraft flight paths. These suburbs range from lower socio-economic suburbs in the middle and outer rings of Brisbane to the upper middle and high socio-economic suburbs in the inner ring locations of Brisbane.

**Table 8: Capital Return and Investment Performance: Median Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
Camp Hill	10.40	9.27	10.22	1.10
Coorparoo	8.97	9.76	10.49	1.08
Tarragindi	4.77	8.32	9.10	1.09
Mt Gravatt East	1.04	7.98	9.10	1.14
Carindale	5.70	6.44	9.48	1.47
Brisbane LGA	4.50	7.29	8.18	1.12

The inner city/city fringe suburbs subject to the southern flight path outperformed the majority of suburbs in Brisbane during 2016. Both Coorparoo and Camp Hill had annual growth in 2016 more than twice the Brisbane average (10.40% and 8.97% respectively). The only suburb in this analysis with a similar growth rate in 2016 was Annerley, a similar distance from the CBD but not under any existing flight paths. As the suburbs move further away from the Brisbane CBD, the capital returns for 2016 also become lower compared to the suburbs closer to the CBD under the southern flight path. Carindale and Tarragindi had similar 2016 growth but the capital return for Mt Gravatt East was only 1.04% (median Price) and 0.16% (average price). These results also confirm that the greater capital returns based on average prices for Camp Hill and Coorparoo compared to the median house prices that the greatest activity was in the higher price segments of these suburbs, but the sale activity in the outer suburbs was generally in the lower prices areas.

**Table 9: Capital Return and Investment Performance: Average Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
Camp Hill	14.71	9.28	8.09	0.87
Coorparoo	8.66	10.20	12.03	1.18
Tarragindi	7.53	8.29	8.75	1.06
Mt Gravatt East	0.16	8.12	10.42	1.28
Carindale	4.44	6.62	9.62	1.45



## 6 Suburb Street Comparison: Northern Flight Path: Varying Distances

Tables 10 and 11 show the investment performance analysis for a range of suburbs under the existing Brisbane Airport northern flight paths. These tables show that in 2016 the inner city suburb of Bardon had the highest capital return based on both median and average house prices. The trend for lower 2016 returns for suburbs located further from the CBD is also evidenced based on the northern flight path, with Gordon Park, Chermside West and Ashgrove having lower returns compared to Bardon. Bardon was also the only suburb in this classification with a 2016 capital return greater than the Brisbane LGA average.

**Table 10: Capital Return and Investment Performance: Median Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
Bulimba	-6.91	11.03	12.65	1.15
Gordon Park	0.00	8.87	8.50	0.96
Albion	-3.42	9.28	12.86	1.39
Chermside West	3.77	7.11	9.54	1.34
Ashgrove	3.31	8.96	9.71	1.08
Bardon	7.02	8.80	10.09	1.15
Brisbane LGA	4.50	7.29	8.18	1.12

In 2016 Bulimba had a negative capital return of -6.91% based on median house prices, but a moderate capital return of 4.92% based on average house prices, with Albion showing a similar trend. This variation in returns can be attributed to a greater level of house sale activity in the lower value sectors of this market compared to the higher value locations within the suburb.

**Table 11: Capital Return and Investment Performance: Average Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
Bulimba	4.92	11.51	15.15	1.32
Gordon Park	-1.19	8.93	8.98	1.01
Albion	1.38	8.61	12.20	1.42
Chermside West	3.83	7.01	9.52	1.36
Ashgrove	5.43	8.90	9.02	1.01
Bardon	12.54	8.71	9.34	1.07

## 7 Suburb Street Comparison: Proposed New Flight Path.

The variation in capital returns and investment performance are also evident in 2016 in the suburbs that will potentially be under a flight path when the new runway is operational. These suburbs have no aircraft noise at present and in the case of both Hamilton and Stafford have showed negative capital returns for 2015, with only Annerley recording a low capital return in 2015 of 1.86%. However, these suburbs have shown an improvement in

house price in 2016 based on both median and average house prices. As previously stated the best performing suburb in 2016 for this suburb classification has been Annerley with a capital return of 9.25% (median house prices) and 9.28% (average house prices). The relationship between distance to the Brisbane CBD and 2016 capital growth is also evidenced in the suburbs that will be subject to the proposed flight path, with 2016 capital returns decreasing as the distance from the CBD increases. Unlike 2015 both Stafford and Hamilton has positive growth in house prices in 2016.

**Table 12: Capital Return and Investment Performance: Median Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
Hamilton	3.96	9.97	22.03	2.21
Stafford	6.31	8.37	10.13	1.21
Annerley	9.28	8.49	9.96	1.18
Brisbane LGA	4.50	7.29	8.18	1.12

As was the case in the 1998-2014 and 2015 analysis, these annual returns are more in line with the socio-economic status and location of the suburbs to schools, transport etc rather than location under flight paths.

**Table 13: Capital Return and Investment Performance: Average Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
Hamilton	2.47	8.98	17.90	1.97
Stafford	5.67	8.52	10.63	1.25
Annerley	9.25	8.88	10.85	1.26

## 8 Suburb Street Comparison: No Flight Path.

In 2016, the highest capital growth for this comparison was in the suburb of New Farm. This is a high value, inner city suburb, with access and views of the Brisbane River, this suburb also achieved a higher capital growth in 2015, compared to the other river front suburbs in the study, based on median house prices. However, when the results are based on average house prices the 2016 capital return was a negative 6.18%, indicating a reduced price in the upper end of this market.

**Table 14: Capital Return and Investment Performance: Median Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%)1988-2016	Average Annual Volatility (%)	Risk return Ratio
New Farm	6.67	11.49	13.14	1.14
Woolloowin	2.44	8.79	9.41	1.07
Mitchelton	4.20	8.12	9.42	1.16
Mansfield	5.83	6.85	8.78	1.28
Brisbane LGA	4.50	7.29	8.18	1.12

The return for all the middle value suburbs of Woolloowin, Mitchelton and Mansfield for the 2016 was also in line with the returns for similar middle value suburbs in the other flight path and noise complaint locations, although houses in these suburbs are not exposed to any current or proposed flight paths.

**Table 15: Capital Return and Investment Performance: Average Price 1988-2016**

Location	2016 Capital Return (%)	Average Annual Capital Return (%) 1988-2016	Average Annual Volatility (%)	Risk return Ratio
New Farm	-6.18	11.10	12.98	1.17
Woolloowin	5.26	9.17	11.04	1.20
Mitchelton	6.71	9.65	11.44	1.19
Mansfield	6.16	7.05	10.01	1.42

When the capital returns for a range of suburbs are analysed on a single year basis, there is always greater variation in the annual returns. This has again been the case with the change in price and the capital return from 2015 to 2016. The results for 2016 year show a range in capital returns much closer in 2016 compared to 2015. In 2015 this range was from -23% to + 22%, both in higher value suburbs, with the 2016 range (median prices) only -6.91% to +10.40% and average prices -6.18% to +14.71%.

Generally the 2016 results and the full 1988-2016 analysis shows the highest price growth was in the HNC suburbs grouping, with Camp Hill recording the highest capital growth for all the suburbs in the study in 2016 and maintaining an average annual capital return for the 29 year period of 9.27%, well above the Brisbane average for the same period, despite being one of the most noise affected suburbs. The most prominent value driver in 2016 appears to be location to the CBD, with returns generally decreasing as distance from Brisbane CBD increases.