



The Requirement For Oil Vulnerability Assessments

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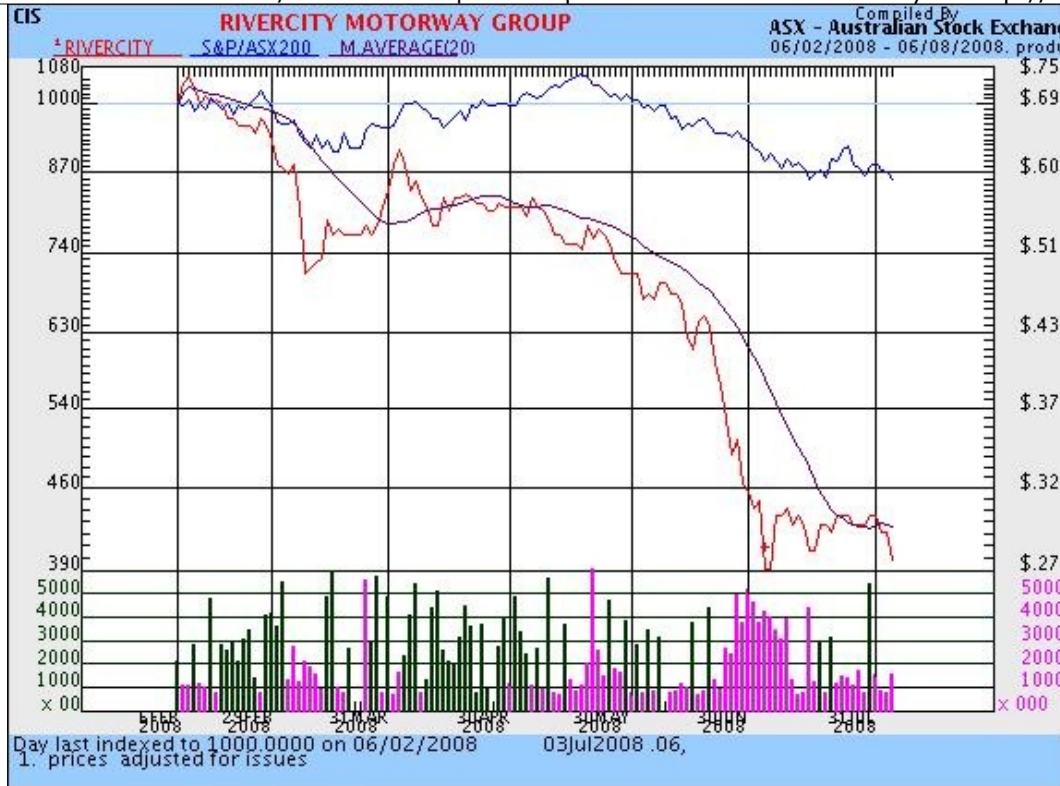
Major transportation projects and the requirement for Oil Vulnerability Assessments

Introduction

I live in South East Queensland, a beautiful part of the world, but one with a population expected to grow significantly over the coming decades. Brisbane, the capital of Queensland, had a population of 1.77 million in 2004. This is expected to grow to 2.58 million by 2026¹. There are a large number of significant infrastructure projects planned, or under construction with the aim of delivering the infrastructure required to support the population growth in South East Queensland.

Unfortunately, despite the Australian Senate's report into [Australia's Future Oil Supply](#), the Queensland Government having established an [Oil Vulnerability Task Force](#) and the Brisbane City Council having established a [Climate Change and Energy Task Force](#), virtually no consideration has been given to the impact that higher oil prices and declining oil production will have on the need for, and the types of infrastructure required to support, a growing population.

This will be to the detriment of the residents of South East Queensland and those who invested in these projects. A case in point is the collapse of the River City Motorway's Group's share price over recent months.



River City Motorway Group Share Price – 6 February to 6 August 2008.

Available from the [Australian Stock Exchange \(ASX\)](http://www.asx.com.au).

This post will examine two major infrastructure projects, the Airport Link road tunnel and the New Parallel Runway project, and the consideration these projects have given to higher oil prices and declining production. The case will then be established for mandatory Oil Vulnerability Assessments for major transport related infrastructure projects.

The approach that will be taken is to examine what consideration was given to fuel prices in the planning for the project, community submissions and the projects response. The current situation for the projects will then be examined to identify the issues associated with failing to conduct an Oil Vulnerability Assessment.

Airport Link

[Airport Link](#) is one of several multi million dollar road infrastructure projects aimed at easing Brisbane’s traffic congestion issues and preparing the city for future population growth. It consists predominantly of an underground toll road, linking Brisbane CBD with the Northern suburbs of Brisbane at a cost of some AU\$3.4 billion. It will also provide road connections to other major arterial roads, such as the Gateway Motorway and North South Bypass Tunnel.

The Airport Link Environmental Impact Statement (EIS) was released in October 2006. In justifying the need for the project, the EIS found that there would be a 44% increase in average weekday vehicle trips in the metropolitan area by 2026, from 2004 figures. Public transport trips would more than double in the same timeframe and increase its mode share from 7.5% to 11.1% over the same period. The EIS goes into significant detail in explaining how the Airport Link traffic forecasting model was developed, applied and tested. There is only one mention of the impact of fuel prices on traffic figures, and this does not mention what fuel prices were modelled or how it would affect vehicle trip projections. A number of future scenario’s were considered, but none that were based on significantly higher oil prices or an oil inspired economic down turn.

As part of the EIS process, members of the community were invited to make submissions to the

Co-ordinator General. In total, 150 submissions were made by individuals and community groups, of which two, one submitted by the Queensland Conservation Council and one by the author, raised concerns about the impact of peak oil on the [Airport Link Project](#). A Supplementary Report was produced as a result of these submissions. The Supplementary Report response to concerns about Peak Oil was:

Issue

Economic analysis model of the Project should include consideration of fuel prices. Fuel pricing and availability may be affected by the peak oil concept (i.e. that at some time in the future global demand for oil products including petrol and diesel fuels will outstrip known reserves) which may drive down the usage of motor vehicles using these fuels.

Response

The technology already exists for motor vehicle propulsion without fossil fuels but rather fuels from renewable sources. In the event of traditional fuels becoming scarce or unavailable the drive would be towards improvements in and much higher usage of motor vehicles driven by renewable fuels rather than the wholesale abandonment of personal transport and freight vehicles. The need for a road network in the urban environment is highly unlikely to disappear as has been recognised by numerous studies and the need to upgrade the network is equally unlikely to disappear.

(http://www.dip.qld.gov.au/docs/library/pdf/mp_airport_Supplementary_Repo..., p. 140)

I wrote a letter to the Coordinator General about this response, but received nothing in reply. However, anyone with even a modicum of understanding about our current energy situation can see that this response is inaccurate, misleading and improbable. In short, it is rubbish.

The Coordinator General's report on the [Airport Link EIS](#) of May 2007 made no mention of the impact of potentially higher fuel prices on the need for, or viability of the Airport Link project. The [Queensland Government has approved](#) the Airport Link project, with construction due to start in September 2008.

BrisConnections, the consortium that will design, construct, operate, maintain and finance the Airport Link project listed on the Australian Securities Exchange on [31 July 2008](#). The value of the initial \$1 instalment, to be followed by two further instalments of \$1, fell to 38.5c within 48 hours of its listing, a fall of 61.5%ⁱⁱ. To be fair, in its [Product Disclosure Statement](#), BrisCon did state that:

The impact of a significant and sustained increase in fuel prices on traffic volumes is a risk that should also be considered. Increased fuel prices may lead to a reduction in car ownership, car utilisation and a shift in modal share to public transport, walking, cycling or motorbikes and scooters.

Any developments that reduce traffic volumes or inhibit the growth in traffic volumes on Airport Link could have a material adverse effect on BrisConnections' financial condition and results of operations. (pp 60 – 61)

This statement shows a little bit more concern than the flippant response provide in the Airport Link EIS Supplementary Report. Of course, time will tell, but with the project not due for completion until 2012, it will be interesting to see the how actual traffic statistics compare against the projections as we approach and pass peak oil and how well BrisConnections' unit price fares.

The New Parallel Runway

Brisbane Airport Corporation (BAC) plans to build a [New Parallel Runway](#) (NPR) at Brisbane Airport at a cost of AU\$1billion. The requirement for the NPR is based upon the forecasts of air travel growth which will exceed existing runway capacity around 2014.

In describing the need for the NPR, the combined Environmental Impact Statement/Major Development Plan (EIS/MDP) examines the impact of higher fuel prices on airline costs and fares was considered in some detail. Given current circumstances, this deserves being shown in full (I have underlined the most relevant parts):

If fuel prices continue to rise or even stabilise at high levels they will generate twin impacts:

- a) Increasing airline fares directly depressing demand; and
- b) Further slowing consumer spend and slowing world economic growth.

Oil prices have now reached levels above US\$70 per barrel. Airlines are operating new-generation aircraft types that are considerably more fuel efficient than their predecessors. It has been assumed that fuel prices are unlikely to stabilise at their recent high levels. The US Energy Information Administration (EIA) Annual Energy Outlook (AEO) 2006 reference case includes much higher world oil prices than were projected in AEO2005. In the AEO2006 reference case, world crude oil prices, expressed in terms of the average price of imported low-sulfur crude oil to US refiners, are projected to continue to increase from \$40.49 per barrel (2004 dollars) in 2004 through to 2006, then decline to \$46.90 per barrel in 2014 (2004 dollars) as new supplies enter the market. Prices then rise slowly to \$54.08 per barrel in 2025 and to \$56.97 per barrel in 2030.

In April 2007, the Supplementary Report to the NPR EIS/MDP was released. 196 individuals or groups provided submissions to the NPR project. Three of the submissions raised concerns about the impact of peak oil on the need for the project, of which two were members of ASPO Australia. Click [here](#) for a copy of one of these submissions. Once again, in the light of current circumstances, the response to concerns raised about peak oil and fuel prices has been shown in full:

The Australian Senate Rural and Regional Affairs and Transport Committee recently released a report (February 2007), following an inquiry into Australia's future oil supply and alternative transport fuels. This inquiry was prompted by the question of whether Australia should be concerned about 'peak oil'. This term refers to the theory that, for fundamental geological reasons, global conventional oil production will reach a peak and

then start an irreversible decline soon enough to be of concern.

In the Final Report, the Committee's comment on Peak Oil was that –

The essence of the peak oil problem is risk management. The risks involved are high if peak oil comes earlier than expected, or if economies cannot adapt quickly enough to the post peak decline. Australian governments need better information from which to decide a prudent response to the risk.

In the context of fuel prices in the future and implications for the transport industry, the Final Report stated –

Demand for oil is relatively inelastic, because for its major use – transport – there are no easy substitutes. This means that a relatively small shortfall in supply can cause a large increase in price. This will increase the volatility of the price in response to small changes in supply when there is little spare capacity. The IEA [International Energy Agency] now expects that the price of crude oil will ease to about US\$47 per barrel by 2012, then increase to US\$55 by 2030 (2005 dollars). Prices are likely to remain volatile. Some commentators believe that much higher prices are possible.

In responding to the issues raised in the submissions, BAC is not in a position to speculate on the timing of Peak Oil and associated implications on the global aviation industry. However, it should be noted that general estimates and projections of fuel costs stated in the Draft EIS/MDP (refer Section 2.7.4) would appear to be consistent with those stated by the Senate Inquiry in its Final Report. It should be recognised that the cost of fuel is only one factor in determining the cost of airfares. For example, no notable reduction in demand for air travel was observed at Brisbane Airport during the recent high fuel price spikes in 2006. The advent of low cost airlines in Australia and overseas has demonstrated a business model that can provide affordable air travel despite an inflated fuel price market. Likewise, the demand for air travel over other modes of transport is not wholly driven by cost. Reduced travel time, convenience and safety of air travel will continue to be relevant factors when consumers are choosing amongst transport options.

Lastly, it should be noted that higher fuel prices are likely to spark further technological improvements in the fuel efficiency of aircraft (such as the use of composite materials in Boeing's new 787 aircraft), expedite fleet modernisation programs and/or initiate greater adoption of alternative/supplementary fuels (eg biofuels).

The Supplementary Report also discusses the strength of its traffic forecast, under low, medium and high growth scenarios. Interestingly enough, the Supplementary Report makes no linkage between the section on peak oil concerns and its forecasts for traffic growth, although the implications of short term issues such as terrorism and SARS are discussed.

The author of one of the submissions cited above subsequently wrote to the Brisbane Airport Corporation Board of Directors:

Please find enclosed a copy of my recent submission, and subsequent addenda, regarding the Draft Environmental Impact Statement/Major Development Plan (EIS/MDP) for the NPR project. The submission describes the impact of oil depletion or 'peak oil' on the project, specifically the assumptions regarding fuel prices and growth in aircraft movements over the medium to long term. My conclusion is that the business

case for the NPR is seriously flawed. The impacts of peak oil should at the very least be incorporated into the project's risk management plan.

I note that the Supplementary Report dismisses the impact of peak oil on the NPR project. The purpose of this letter is to draw your attention to the flawed arguments contained in this report in order for you to properly address the risks to the project, and more broadly to BAC, arising from the peak oil phenomenon.

First, the report reinforces the forecasting undertaken for the EIS/MDP by well-respected company Tourism Futures International (TFI). While I do not have direct access to the TFI forecast, I do know that similar forecasts either refer to the same 'official' but discredited oil price forecasts from the EIA or similar agencies already cited in the EIS/MDP, or worse, dismiss oil price increases altogether as 'externalities'. In any case, this amounts to wishing the problem away.

Second, the report emphasises that historical trends show that 'unknown factors' and other 'externalities' have only a short term effect on the long term trend of increasing passenger growth. Certainly this is true in the historical sense, however it needs to be understood that peak oil will reverse this trend because, once world oil production peaks, it will be permanently in decline. This issue was addressed explicitly in Hirsch et. al., *Peaking of World Oil Production: Impacts, Mitigation & Risk Management*, February 2005 (p. 27), a report that was commissioned by the US Department of Energy:

Difficulties in Deriving Implications from Past Experience

Over the past 30 years, most economic studies of the impact of oil supply disruptions assumed that the interruptions were temporary and that each situation would shortly return to "normal." Thus, the major focus of most studies was determination of the appropriate fiscal and monetary policies required to minimize negative economic impacts and the development of policies to help the economy and labor market adjust until the disruption ended. Few economists considered a situation where the oil supply shortfall may be long-lived.

Since 1970, most large oil price increases were eventually followed by oil price declines, and, since these cycles were expected to be repeated, it was generally felt that "the problem will take care of itself as long as the government does nothing and does not interfere."

Third, the report quotes sections of the 2007 Australian Senate Rural and Regional Affairs and Transport Committee report that describe peak oil as a risk management problem. Peak oil is indeed a risk management problem, however the EIS/MDP and Supplementary Report make it clear that BAC is addressing this risk not by managing it, but by ignoring it.

Fourth, again quoting the Senate report, the Supplementary Report cites an IEA (International Energy Agency) forecast that states "crude oil will ease to about US\$47 per barrel by 2012, then increase to US\$55 by 2030 (2005 dollars)." The Supplementary report then states that "BAC is not in a position to speculate on the timing of Peak Oil and associated implications on the global aviation industry." However, by citing another discredited report that places the peak beyond 2030 BAC is, by definition, speculating on the timing of peak oil. All credible oil industry analysts and official agencies, including the IEA and the EIA, concede that there will be a peak; the

only disagreement is over the timing. On this basis, the Senate report makes the following argument:

The committee cannot take sides with any particular suggested date for peak oil. However in the committee's view the possibility of a peak of conventional oil production before 2030 should be a matter of concern. Exactly when it occurs ... is not the important point. In view of the enormous changes that will be needed to move to a less oil dependent future, Australia should be planning for it now.

Fifth, the Supplementary Report claims that the "advent of low cost airlines in Australia and overseas has demonstrated a business model that can provide affordable air travel despite an inflated fuel price market." Noting the above comments about historical data, a number of analysts have made the point that low cost airlines in fact face greater risks from peak oil than do traditional airlines, for two simple reasons. The first is that fuel already represents a greater proportion of operating costs (approximately 25%) and will continue to grow as a proportion of costs as fuel prices increase. A number of airlines worldwide, including VirginBlue, have at various times sought to reduce the impact of fuel price volatility by hedging, however this short term strategy cannot overcome permanently increasing prices. The second and even more important reason is that current passenger demand for low cost airlines is largely determined by discretionary spending and relatively high disposable incomes prevalent in the presently buoyant economy. However a general economic downturn triggered by peak oil will directly threaten this demand. These macro-economic, or demand side impacts in the case of airlines, are also described in the Hirsch report (pp. 27-28 and 30):

How Oil Supply Shortfalls Affect the Global Economy

Oil prices play a key role in the global economy, since the major impact of an oil supply disruption is higher oil prices. Oil price increases transfer income from oil importing to oil exporting countries, and the net impact on world economic growth is negative. For oil importing countries, increased oil prices reduce national income because spending on oil rises, and there is less available to spend on other goods and services. Not surprisingly, the larger the oil price increase and the longer higher prices are sustained, the more severe is the macroeconomic impact.

Higher oil prices result in increased costs for the production of goods and services, as well as inflation, unemployment, reduced demand for products other than oil, and lower capital investment. Tax revenues decline and budget deficits increase, driving up interest rates. These effects will be greater the more abrupt and severe the oil price increase and will be exacerbated by the impact on consumer and business confidence.

Implications [for] The World Economy

A shortfall of oil supplies caused by world conventional oil production peaking will sharply increase oil prices and oil price volatility. As oil peaking is approached, relatively minor events will likely have more pronounced impacts on oil prices and futures markets.

Oil prices remain a key determinant of global economic performance, and

world economic growth over the past 50 years has been negatively impacted in the wake of increased oil prices. The greater the supply shortfall, the higher the price increases; the longer the shortfall, the greater will be the adverse economic affects.

The long-run impact of sustained, significantly increased oil prices associated with oil peaking will be severe. Virtually certain are increases in inflation and unemployment, declines in the output of goods and services, and a degradation of living standards. Without timely mitigation, the long-run impact on the developed economies will almost certainly be extremely damaging, while many developing nations will likely be even worse off.

Finally, the Supplementary Report claims that the threat to the airline industry posed by peak oil will be eliminated by the uptake of technological improvements such as fuel efficiency and alternative fuels such as bio-fuels. As I noted in my submission, incremental fuel efficiency gains are certainly mitigating the problem, however these gains will be dwarfed by the enormity of the direct and indirect economic impacts of peak oil in the coming years. Furthermore, the economies of scale associated with bio-fuels mean that they will at best have only a marginal effect on fuel prices even if the technical difficulties can be overcome.

The other fact that should concern the Board is that the peak oil phenomenon is well understood by both of the project's lead consultants – Arup and Maunsell. Some of the published work by Arup consultants in the UK is highlighted in my original submission. Addendum 2 to my submission highlights the involvement of Maunsell in the Brisbane City Council's recent Climate Change and Energy Taskforce, which specifically examined the impact of peak oil on Brisbane, including the airline industry, Brisbane Airport and related infrastructure. I have enclosed a copy of Maunsell's press release regarding their involvement in this task force, which is sub-titled 'Maunsell guides Brisbane in Facing-up to Climate Change and Peak Oil' and states in part:

The report surveyed the challenges that Brisbane would face as a result of climate change and peak oil, and in cutting greenhouse gas emissions. Maunsell Principal Consultant – Sustainability, Scott Losee, was a member of the four person taskforce, with Maunsell commissioned to write the final report for the Taskforce. This appointment recognised Maunsell's cutting-edge capability in advising clients on the implications of these global issues for their organisations.

The fact that Maunsell's 'cutting edge capability' and Arup's expertise in this area were not brought to bear on the \$1 billion NPR project raises serious questions as to the credibility of the project team. Either the lead consultants chose not to bring the matter to the Project Director's attention or the Project Director himself has chosen to wish the problem away. In either case the BAC Board would best serve the interests of the corporation and its investors by taking a more rigorous approach to assessing and actively managing the risks posed by peak oil.

In my view the Board has a duty to both its investors and the public to provide a full and proper disclosure regarding the very real risks posed by peak oil. I would be pleased to assist you in this endeavour.

Approval for the NPR was granted by the then Minister for Transport and Regional Services, Mark Vaile, on [18 September 2007](#).

Obviously since these statements went to press, only 15 months ago, the situation with regards to oil prices has changed dramatically, making the assessments in the both the EIS/MDP and the Supplementary report look quite comical. The impact of high oil prices on airlines is enormous with 25 airlines collapsing or ceasing operation in the first half of 2008. According to the International Air Transport Association (IATA), the industry forecast for 2008 will be a loss of [US\\$2.3 billion](#). This is despite fuel efficiency improving by 19% and non-fuel unit costs dropping by 18% since [2001](#). Australia's airlines have not been immune to this either, with capacity reductions, job losses and fare increases. Click [here](#) for my assessment of the future profitability of QANTAS and Virgin Blue. The question must be asked, does Brisbane need the NPR?

The Need for Mandatory Oil Vulnerability Assessments

The Airport Link and New Parallel Runway are just two of many projects and many billions of dollars worth of investment being planned or delivered in Australia, to meet the needs of a growing population. Whilst the future growth of Australia's population is inevitable for the next few decades, the growth in global oil production is not. The most obvious impact of this is that the price of oil is likely to remain high with the potential to go much higher, which in turn will have negative economic consequences, the beginnings of which are reported daily in the media.

Despite this, large infrastructure projects, particularly for transport and aviation, continue to be planned with only lip service paid to a very real and significant risk, namely the future price and availability of oil based fuels. Risk is made up of two components, being likelihood and impact. The likelihood of an oil supply 'crunch' is increasing over time. How big the impact will be is largely dependent upon how well we transition our economy away from oil dependency. Based on current attitudes towards oil depletion, the impact is likely to be significant. Combine these two factors and we come up with a high level of risk.

As a minimum, it would appear that companies should disclose and discuss the oil vulnerability risk in the Investor's Prospectus, or risk litigation by investors. Another consideration is that of [force majeure](#). In the event of a commercial disaster brought on by extremely high fuel costs, the companies associated with these infrastructure projects cannot claim that the event was "impossible to foresee." Force majeure requires that both parties had no ability to foresee the event. So it would appear that companies could be legally liable for downstream risks if they have not conducted a vulnerability assessment and taken appropriate action.

In the last four or five years, there has been a significant number of warnings and reports warning of an impending oil supply problem. Both of the projects discussed here have acknowledged that future oil prices and availability have the potential to be an issue. Whether these projects have adequately considered the impact and likelihood of the risks associated with peak oil, and informed their investors of these risks, will likely be settled in the court room at some point in the future.

On a brighter note, it appears that Queensland's Coordinator-General appears to have recognised the issue of peak oil. Maybe the wheel is slowly turning. For example, the Terms of Reference (TOR) for the [Northern Link tunnel Environmental Impact Statement](#) includes the following clause:

... the sensitivity of modeling assumptions to large changes in global oil availability and oil price vulnerability over the life of the project are to be assessed for the construction and operational phases. This assessment should document assumptions and provide

estimates for the impact of fuel price changes on:

- travel behaviour in the study area, including possible modal shift changes to public transport and non-motorised transport.
- traffic volumes using the project; and
- the commercial viability of the project over its life.

Governments and business have limits to their financial resources. As a result the use of these resources needs to be prioritised to ensure that the community obtains the infrastructure that it requires. Ensuring that this occurs is the role of government. I would suggest that both of the projects examined here will struggle financially in the years and decades to come. At the same time, the residents of Brisbane are likely to have insufficient public transport, due to insufficient investment, as the price of oil climbs ever higher. How do we avoid this problem?

The solution is simple. Every major transport based infrastructure project should be required to complete an Oil Vulnerability Assessment. The assessment should consider factors such as how exposed is the project to the impact of high fuel prices or supply shortfalls, will the project reduce oil dependency and what risk mitigation strategies will the project take to minimise its exposure. An oil vulnerability assessment should also be applied retrospectively to those transportation projects currently underway. Whilst it might be expensive to cancel or modify projects, not to mention politically embarrassing for those politicians who have not grasped peak oil, it will be far more embarrassing to complete projects that will become white elephants as we approach and past peak oil. An approach such as this would go a long way to reducing the risks associated with large infrastructure projects, look after the best interests of the community, investors, governments and business' as well as providing some form of systemic rigour to preparing for the terminal decline in oil production.

The challenge therefore goes out to the Commonwealth Government, State Governments and Local Governments. Immediately institute mandatory Oil Vulnerability Assessments for all transport projects, current and planned, to ensure that Australians are provided with the infrastructure they need in a post peak oil world.

- i. Sect 1.1 of Chapter 1 of Airport Link Phase 2 Detailed Feasibility Study of October 2006, available from <http://www.airportlinkeis.com>
- ii. McCullough, J. Investors pull plug on BrisCon, in The Courier Mail, August 2-3, 2008, p. 73.



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