

**Tourism Economic Impact Assessment
of the UK Giant Panda Project**

A Report for Scottish Enterprise

Summary Report

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Executive Summary

Purpose

This report examines the potential visitor expenditure related economic impacts associated with the UK Giant Panda project. It does not account for any of the partnership, conservation, trade, science, education and culture impacts of this project which, although potentially substantial, lie out-with the scope of this research.

It considers the visitor expenditure impacts under four scenarios:

- **counterfactual scenario:** what would have happened had the project not taken place
- **minimum case scenario:** assuming that there is no additional activity beyond the zoo itself
- **limited impact scenario:** assuming the benefits of the pandas are leveraged through limited additional activity delivered through individual, ad hoc activities delivered by individual businesses and agencies
- **panda premium scenario:** where there is a concerted, co-ordinated effort by a range of partners to fully exploit the visitor growth potential of the pandas

Scale of the opportunity

Edinburgh Zoo is one of only 15 zoos in the world to house Giant Pandas and Edinburgh is the world's smallest 'panda city'. The project therefore gives the city a unique opportunity to 'punch above its weight' both in terms of attracting visitors and building trade links with China. For example, we estimate that over the next ten years:

- In the hypothetical situation where the project did not take place, Edinburgh Zoo would contribute **£13.743 million visitor expenditure** and **£6.459 million GVA** to the **Edinburgh** economy, and support the equivalent of **28 jobs**. However, it would remain a regional attraction, and would add **no net value** to the Scottish economy
- In our most pessimistic 'with project' scenario, where only the zoo takes action to promote the pandas, and the pandas do not produce any cubs, we estimate that:
 - an extra **£2.781 million of visitor expenditure** will be spent in the **Edinburgh** economy, with an extra **£1.468 million** spent in the **Scottish** economy
 - an extra **£1.307 million GVA** will be generated in **Edinburgh**, with an extra **£690,000** generated in **Scotland**
 - the equivalent of **5 extra jobs** will be supported across **Edinburgh**, and **3** will be supported across **Scotland**
- In our most optimistic 'with project' scenario, where all stakeholders work together to optimise the value of the pandas for the city, including the launch of a panda day celebration, we estimate that:
 - an extra **£27.637 million of visitor expenditure** will be spent in the **Edinburgh** economy, with an extra **£19,273 million** spent in the **Scottish** economy
 - an extra **£12.989 million GVA** will be generated in **Edinburgh**, with an extra **£9.058 million** generated in **Scotland**
 - the equivalent of **55 jobs** will be supported across **Edinburgh**, and **38** will be supported across **Scotland**

These impacts demonstrate that the Giant Panda Project has the potential to support a substantial increase in tourism revenue both for the zoo itself, and for the economies of Edinburgh and Scotland as a whole. The figures also emphasise the economic importance of having a partnership based approach to maximising the impact of the pandas. We provide full details of the impact workings in the accompanying technical report.

Learning from experience

Our review of the experiences of other zoos has identified a number of good practice examples of actions the zoo and its partners can follow (and in many cases are following already) to optimise the impact of the pandas. These include:

- establishing partnerships with international media companies to promote the pandas overseas
- seeking opportunities for corporate sponsorship
- cub naming competitions
- use of social media and on-line streaming
- inclusion of other indigenous Chinese plants and species in a Chinese theme area
- a regular programme of marketed days to maintain interest in the pandas
- a new, city wide, celebration of the pandas, and their contribution to Chinese culture
- using the pandas as a platform to bring new conferences to Edinburgh
- identifying partnership based marketing opportunities with other tourist or customer facing businesses in the city
- use of the pandas as a 'hook' to attract visitors who may not have seen Edinburgh as a primary destination historically, such as the family market
- utilise the pandas as a platform to raise awareness of Edinburgh with the growing Chinese market

Recommendations

- SE should disseminate the findings from this study to tourism businesses across Edinburgh and Scotland, as a way of raising awareness of the scale of the opportunity, and encouraging businesses to make the most of this opportunity
- SE should work with other tourism and place marketing partners to identify ways of branding Edinburgh as a 'China friendly' place to visit and do business
- SE should work with RZSS and other partners to develop a new 'Panda Day' celebration in Edinburgh, starting in 2013
- SE should work with RZSS, the Scottish and UK Governments and other partners to encourage senior Chinese politicians to visit Edinburgh Zoo as part of any future state visits to the UK
- the Edinburgh Zoo visitor survey questionnaire should be updated to include questions on the role of the pandas in people's decisions to visit the zoo, the role of the zoo in people's decisions to visit Edinburgh and off-site expenditure
- further research should be conducted to explore the partnership, conservation, trade, science, education and cultural benefits associated with the project
- a follow up study should be undertaken in 12 month's time to assess the actual economic impact

1 Introduction and overview

1.1 The UK Giant Panda Project

On 10th January 2011, the Royal Zoological Society of Scotland (RZSS) signed an agreement with the Chinese Wildlife Conservation Association (CWCA) for Edinburgh Zoo to participate in China's Giant Panda Breeding Programme. As part of the agreement, the zoo now houses two giant pandas for a 10 year period, which started in December 2011 and will run to December 2021 (with opportunities for an extension beyond this date). The two pandas, Tian Tian and Yang Guang were born in 2003, and have already bred successfully (though not together) at their current home in Chengdu, China.

The project is strategically important for both Scotland and China and offers a number of benefits to both nations including:

- **partnership:** the project will be conducted in partnership between Edinburgh Zoo and the Wolong Panda Breeding Centre, and will strengthen the working relationships between these two institutions
- **conservation:** the project includes a research project to reintroduce pandas to the wild, and effort to breed new pandas to support the conservation of the species
- **trade:** the project is seen as a sign that China is 'open for business' and an invitation to Scottish businesses to establish closer links with China
- **science:** the project includes a number of scientific research projects in the fields of bacteriology, oncology, dentistry, and research into the dietary needs of pandas
- **education:** the project presents an opportunity to educate Edinburgh Zoo visitors about pandas and other endangered species
- **culture:** the project presents an opportunity for enhanced UK-Sino cultural understanding

While the economic value of each of the above strategic benefits may be substantial, they do not fall within the remit of this study, and the purpose of this research is to measure only the tourism related impacts that the pandas could bring to the Scotland and Edinburgh economies.

1.2 Scale of the opportunity

Following the arrival of Tian Tian and Yang Guang on 4th December, Edinburgh became one of only 15 places in the world outside of China to host Giant Pandas, and the world's smallest 'panda city'. This has led to a significant increase in publicity for the zoo, with the pandas discussed widely in the UK and international press, on TV, radio and online, contributing to a 78% increase enquiries for Edinburgh hotel rooms at one online accommodation search engine¹.

Edinburgh's position as the world's smallest panda city could potentially help the city to 'punch above its weight' both in terms of attracting visitors and building trade links to China. The city's size also presents an opportunity to adopt a more strategic, destination level, approach to exploit this unique opportunity. This could involve the co-ordinated efforts of city partners from an economic development, visitor development, education and events background.

In addition, the pandas may help the city to better position itself as a family friendly visitor destination and encourage more tourists to visit the city with their children.

¹ <http://news.caterer.com/dev/article/view/hotel/801232166/hotels-com-says-pandas-spark-interest-in-edinburgh-accommodation/>

Table 1.1: Zoo cities in order of size ²

City locations	Population
Mexico City, Mexico	8.9 million
Tokyo, Japan	8.9 million
Madrid, Spain	6.5 million
Washington DC, USA	5.6 million
Atlanta, USA	5.3 million
Berlin, Germany	4.4 million
San Diego, USA	3.1 million
Vienna, Austria	2.4 million
Kobe, Japan	1.5 million
Memphis, USA	1.3 million
Adelaide, Australia	1.2 million
Chiang Mai, Thailand	961,000
Edinburgh, UK	837,000
Countryside locations	
Zoo Parc de Beauval, Loire Valley, France	n/a
Adventure World, Wakayama, Japan	n/a

Source: GROS, city authority websites and national departments of statistics

1.3 The objectives of this research

The Giant Panda Project provides an opportunity to support the tourism economies of Edinburgh and Scotland by attracting new visitors to the city, and by encouraging them to buy goods and services from Scottish businesses as part of their visit. This paper will examine the scale of the opportunity by developing a series of estimates of potential impacts based on three scenarios:

² To address disparities in sizes of local government boundaries, all figures based on total metropolitan areas. For example, Edinburgh figure includes East, West and Midlothian. Two further cities are also in discussions with China about hosting giant: Singapore (pop. 5.2 million) and Calgary (pop. 1.2 million)

- **minimum case scenario:** which assumes that the project goes ahead, but that there is no additional activity beyond the zoo itself
- **limited impact scenario:** which assumes that the benefits of the project are leveraged through limited additional activity delivered through individual, ad hoc projects by individual businesses and agencies
- **panda premium scenario:** where there is a concerted, co-ordinated effort by a range of partners to fully exploit the visitor growth potential of the pandas

Our research is based on a review of actions taken by other panda zoos around the world and activities planned for Edinburgh. It draws evidence from a review of written materials, discussions with key zoo staff members in Edinburgh and overseas and discussions with key stakeholders in the Edinburgh and Scotland tourism sectors.

It should be stressed that all of this research considers only the economic impacts associated with visitor expenditure, and does not account for any of the trade and investment impacts that the City and Scotland may also receive.

1.4 Report structure

The remainder of this report is structured as follows:

- Section two presents the findings from our case study research into the impacts of the pandas on other cities in the world
- Section three discusses ways in which Edinburgh and Scotland can capitalise on the panda's presence, and defines our three scenarios
- Section four summarises the quantitative findings from our analysis
- Section five summarises the key conclusions of the research
- We list the consultation participants in Appendix 1

2 Case study review of panda zoo cities

2.1 Introduction

This section examines the impacts that the arrival of giant pandas has had on other world zoos in recent years. It is based on the findings of a web-based review, interviews with key personnel at the zoos, and interviews with other zoo stakeholders.

2.2 Zoologischer Garten, Berlin, Germany

The zoo received Bao Bao in 1980, and he is now the world's oldest panda in captivity, aged 35. While several breeding attempts have been made through artificial insemination, none have been successful. Although the panda has been a regular fixture at the zoo for over 30 years, he still attracts significant media attention, and it is estimated that the German press publish between 100 and 150 articles about him each year³.

Had the zoo been successful in breeding a cub, there is little doubt that this would have created a major publicity coup for both the zoo and the city. For example, when Knut, a polar bear cub, was born at the zoo in 2007, the zoo marketed his first public appearance as 'Knut Day'. The event was broadcast live on CNN, and attracted 400 journalists. The zoo also recorded its highest ever number of visitors (400,000) that summer.

2.3 Zoo Aquarium de Madrid, Spain

The zoo received Bing Xing and Hua Zuiba, in 2007. They then gave birth to two twin cubs, Po and De De, in 2010, both of whom remain with the zoo. Po (named after a character in the film 'Kung Fu Panda') was given his name by Paramount Pictures Spain as part of a sponsorship deal. The Spanish Government sought to maximise the tourism impact of the panda's birth through the attendance of Queen Sofia at their first public appearance.

³ http://www.chinadaily.com.cn/english/doc/2005-11/08/content_492333.htm

2.4 Tiergarten Schönbrunn, Vienna, Austria

Established in 1752, Tiergarten Schönbrunn, the world's oldest zoo, received Yang Yang and Long Hui in 2003. They have so far given birth to two cubs, Fu Long (in 2007) and Fu Hu (in 2010). Fu Long was returned to China in 2009, while Fu Hu remains with the zoo. The Austrian post office marked the arrival of the pandas by issuing a set of commemorative stamps, while the Austrian Chancellor visited the zoo to welcome them.

2.5 National Zoo, Washington DC, USA

The National Zoo was one of the first beneficiaries of 'Panda Diplomacy' when it received Ling Ling and Hsing Hsing, following President Nixon's visit to China in 1972. The pair did not succeed in breeding any cubs, and died in 1992 and 1999 respectively. Following this, the zoo received a second breeding pair, Tian Tian and Mei Xiang, in 2000. They gave birth to a cub, Tai Shan in 2005.

The zoo appear to have been particularly successful in utilising the cub's birth for marketing purposes, licencing a TV documentary covering the first year of Tai Shan's life, and organising an on-line poll to name the cub, which received 202,000 votes. By April 2012, a video of the cub sneezing⁴ had become the world's 6th most viewed Youtube posting of all time, receiving 134.9 million views, equivalent to over 40% of the US population or over 50% of all internet users in the USA⁵.

Tai Shan also provided a unique marketing opportunity for the logistics company Fed Ex who, in 2010, transported the panda from the zoo to Dulles Airport, then onwards to Chengdu, China using the 'Panda Express', a Boeing 777 with a FedEx logo and a picture of a panda on its livery. It is

⁴ <http://www.youtube.com/watch?v=FzRH3iTQPrk>

⁵ Source: International Telecommunications Union, <http://www.internetworldstats.com/america.htm#us>

estimated that this led to the company's logo being seen by over 1 billion people worldwide⁶.

Because the National Zoo went through a one year period (1999) without any pandas before obtaining one again, an analysis of its visitor numbers provides a useful indication of the impact of pandas on visitor numbers. This shows that visits to the zoo fell from 3 million in 1998 to 2.5 million in 1999 (a fall of 16.7%), before rising again to 2.9 million in 2000 (a 16% rise).

2.6 Memphis Zoo, USA

Memphis Zoo received Le Le and Ya Ya in 2003. They have yet to produce any cubs. The two pandas form the centrepiece of the zoo's China Exhibit, an area of the zoo dedicated to showing Chinese animal and birdlife.

Prior to the panda's arrival, research by the University of Memphis estimated that the pandas would contribute to a 62% increase in visitor numbers (400,000 extra visitors) during the panda's first year in the city, with this impact falling to 23% (150,000) by the end of their stay (this assumption was partly based on the 81% increase that the zoo received as a result of a temporary giant panda loan in 1987). They also estimated that these extra visitors would collectively spend US\$135.5 million over the ten years, supporting an economic impact of \$647 million in the Memphis area.

Following the commercial success of their work with National Zoo Washington, Fed Ex, a Memphis based company, also provided their Panda Express service for the transportation of Le Le and Ya Ya from China to Memphis.

2.7 San Diego Zoo, USA

San Diego Zoo received Shi Shi and Bai Yun in 1996, with Shi Shi replaced by Gao Gao in 2003. The zoo has been particularly successful in its breeding programme, and five cubs have been born at the zoo over the past 15 years. Four of these: Hua Mei (born 1999), Mei Sheng (2003), Su Lin (2005) and Zhen Zhen (2007) have since been returned to China, while the fifth, Yun Zi (born 2009) remains with the Zoo.

The pandas form the centrepiece of the zoo's Giant Panda Discovery Centre and Panda Trek exhibits, which also includes several other examples of Chinese wildlife and vegetation, including red pandas, and several varieties of bamboo.

2.8 Zoo Atlanta, USA

Zoo Atlanta received Yang Yang and Lun Lun in 1999. They have subsequently given birth to three cubs, Mei Lan (born 2006, returned to China in 2010), Xi Lang (born 2008, still with the zoo) and Po (born 2010, still with the Zoo). The birth of Mei Lan was a major publicity coup for the zoo, with the city's *The Sunday Paper* naming him 2006 Person of the Year, beating the city's Congresswoman and NFL Quarterback.

As with the cub in Madrid, Po was also named after the film character. The film's creators, Dreamworks Animation, sponsored the zoo's 100 day giant panda cub celebrations, and Jack Black, a voice actor in the film, attended the zoo's naming ceremony.

The pandas helped to support a 43% increase in visits to the zoo during its first year, and a 14% increase in 2008. They are also estimated to have brought about an additional 15 million hits per annum to the zoo's website, equivalent to approximately 40,000 extra hits per day.

⁶ Figures sourced from discussions between RZSS and FedEx.

2.9 Adelaide Zoo, Australia

Adelaide Zoo received Wang Wang and Funi in 2009. The two pandas, the only ones in the Southern Hemisphere, have formed one of the centrepieces of the South Australia Tourism Board's tourism strategy. As with Edinburgh Zoo, admittance to see the pandas is not guaranteed to all zoo visitors, and pre-booking may be required, however they allow this to be done either in person or online.

To encourage additional visitor expenditure at the zoo, Adelaide offer the choice of a 'behind the scenes' ticket. This gives visitors the opportunity to feed the pandas their breakfast, and release them into their day enclosure.

An economic impact study commissioned by the Tourism Board estimated that the pandas would bring a 70% increase in visitor numbers in year 1, and an economic impact of AU\$632 million over the ten year period, including \$437 million in accommodation, hospitality and other expenditure, \$30 million in zoo revenue and \$165 million from job creation.

Adelaide's warm climate has given the zoo some challenges and the zoo was required to go to the expense of installing climate control systems in the panda enclosures.

2.10 Chiang Mai Zoo, Thailand

Chiang Mai Zoo received Chuang Chuang and Lin Hui in 2003, and they gave birth to Lin Ping in 2009. TV viewers in Thailand can watch their movements 24 hours a day on the Panda TV channel.

2.11 Further examples of good practice

2.11.1 International Red Panda Day

International Red Panda Day takes place on 17th September each year. It is organised by the Red Panda Network, a conservation charity as aims to raise funds for a new conservation centre in Nepal. The last event received support from 22 zoos worldwide, including Zagreb Zoo in Croatia, who held a naming ceremony for its latest red panda cub on this date, and Rotterdam Zoo in the Netherlands, who organised a discussion on one of the city's principal radio stations. While Red Pandas bear little relation to Giant Pandas as a species, this serves as a useful example of an annual animal celebration day which may have parallels to the proposed Panda Day celebration in Edinburgh.

2.11.2 Columbus Zoo, Ohio

With a population of 787,000, Columbus, Ohio, is more comparable to Edinburgh in size than any of the panda zoo cities. Although it is not one of the four US Zoos hosting Giant Pandas, Columbus Zoo still has a strong reputation, and was named as the "top zoo in America" by USA Travel Guide. The zoo has a strong working relationship with other tourism and economic development bodies in the city. For example, they offer reduced price admission to anyone who buys their tickets at the City's visitor information centre and, ahead of their acquisition of new polar bears in 2010, they received two loans from their local port authority⁷ to part fund a new zoo entrance and examine the feasibility of building a new hotel at the zoo.

⁷ Delaware County Port Authority <http://delawarecountyport.com/?cat=3>

3 Opportunities for Edinburgh

3.1 Introduction

The purpose of this section is to identify opportunities that the RZSS and its partners could exploit to help maximise the visitor expenditure related economic impacts of the Giant Panda Project. It builds on the findings from the case study section, activity which is already planned or underway, as well as the views expressed by key project stakeholders during our consultations. It divides the opportunities into three types:

- **Opportunities for RZSS acting alone:** which the zoo will be capable of delivering without the support of any external partners
- **Opportunities deliverable with ad-hoc support:** which will either involve RZSS working in conjunction with other organisations in the city, or other city organisations taking actions on their own initiative
- **Opportunities requiring city-wide strategic action:** which will require all of the city's key stakeholders to work together as a collective team

3.2 Opportunities for RZSS acting alone

3.2.1 Social media and on-line streaming

RZSS already recognise the potential value that social media can bring to their charity as a marketing tool, and use Twitter and Facebook to inform their friends and followers of news from the zoo. This allows the zoo to obtain a global network of followers, and costs effectively disseminate information about the pandas, the zoo and the city. This may include replicating good practice from other panda zoos, such as commemorating the birthdays of pandas based at the zoo, and naming competitions for any new born cubs.

The zoo has also developed a new 'Panda Cam', streaming a live, 24 hour video feed of the pandas' movements to a global audience from the Edinburgh Zoo website, which attracts between 10,000 and 15,000 hits per day. This builds on the success of their existing 'Penguin Cam' which attracts an estimated 2 million views per year, including 80,000 views in a single day following the heavy snow fall in late 2010.

3.2.2 Pro-active pursuit of marketing opportunities

The zoo has already identified a number of opportunities to generate publicity around the pandas, including:

- allowing the BBC to film a documentary about the pandas' journey from China to Edinburgh, which will be broadcast across the whole of the UK on BBC Television, and will be distributed internationally through BBC Worldwide. While the BBC had an exclusivity agreement with the zoo for the duration of the pandas journey, this expired after their arrival, and they are currently in negotiations with a number of other broadcasters around further programmes
- issuing press releases around the panda mating programme, which have attracted substantial attention across the UK media

- deciding to grow their own bamboo on site⁸. While this decision was taken for economic and animal welfare reasons, it nonetheless presents a PR opportunity that RZSS has been able to exploit
- RZSS has already recognised the 40th anniversary of renewed Sino-UK diplomatic relations in 2012 and the 100th anniversary of Edinburgh Zoo in 2013 as two strong marketing opportunities in the near future. They also anticipate a visit by a senior Chinese Government delegation at some point in 2012
- RZSS is in discussion with the China Wildlife Conservation Association around the possibility of participating in a global panda exhibit

3.3 Opportunities deliverable with ad-hoc support

3.3.1 Development of a China theme area

While RZSS has sufficient resources to introduce new species to its zoo, it is unlikely to be able to fund a large scale China theme area in the style of Memphis Zoo' China Exhibit and San Diego Zoo's Panda Trek without external funding support. However, before committing to any such scheme, it will be necessary to determine whether such a scheme would be feasible and appropriate, given Edinburgh Zoo's size and topography.

3.3.2 Sponsorship

Sponsorship of the zoo or of the pandas could bring significant benefits to both the zoo, in terms of revenue, and the sponsor company, in terms of brand awareness both at home and in China. Such sponsorship would also be beneficial to the Edinburgh economy from a visitor expenditure perspective, as it would create conditions under which another business would have a vested financial interest in championing the pandas, and encouraging visitors to come to Edinburgh to see them. The zoo has already successfully negotiated some sponsorship deals, including an advertising deal with the makers of Lynx deodorant.

3.3.3 Conference hosting

As Edinburgh Zoo is located in a city with good hotel and conference facilities, the Giant Panda Project could serve as a 'hook' to help the city to host more conferences in the fields of zoology and environmental sustainability.

⁸ Most of the bamboo currently offered to the pandas is imported, however a small amount is grown on site for use in emergencies

3.3.4 Establish a ticketing partner

The zoo has arrangements in place with several hotels, including the Apex, Marriot and Holiday Inn giving them passwords for the zoo booking system, thus enabling them to arrange visits to the pandas on behalf of their guests. They also have an arrangement with the Edinburgh Visitor Information Centre allowing them to arrange tickets on behalf of their customers.

3.3.5 Further partnership opportunities

Other examples of partnership opportunities successfully identified by the zoo include:

- an arrangement with Stagecoach, whereby the bus company organises coach journeys from Aberdeen and Ayr every day, and the zoo sets aside panda tour passes to all of the passengers on board
- an arrangement with Wiseman's dairies under which panda branding will appear on each of the 1.7 million cartons of school milk that the dairy provides each week

3.4 Opportunities requiring city-wide strategic action

3.4.1 Panda Celebration Day

The RZSS is considering options to develop an annual Panda Day celebration. This event, held either in the off-season or in the shoulder months, is widely recognised as a good idea for encouraging visitors to travel to Edinburgh at a time when they may not otherwise do so, and for helping the city to attract a more mixed and family oriented cohort of visitors than it is at present. In addition, it is also seen as an opportunity for Edinburgh and Scotland to develop closer cultural, political and economic ties with China, and to educate Scottish school children about China's language, culture and history.

There is a strong degree of consensus as to what a Panda Day should involve, for example:

- All of the participants in our consultation agreed that the event would be best held in the quieter months of the year
- the event should be supplemented with a series of other, smaller celebrations throughout the year (including the birthdays of each panda and the anniversary of their arrival)
- given the limited time available to organise a Panda Day in 2012, and the strong interest that the pandas are likely to receive at this point regardless of whether the event takes place, there was a feeling that a Panda Day celebration may not be needed this year, though there may be an opportunity for a celebration if, as expected, China sends a senior Government delegation to the UK this year and Edinburgh Zoo forms part of this visit.

3.4.2 International marketing

Aside from the use of social media, and a limited marketing campaign in the North of England, RZSS will not have the resources to market the zoo outside of Scotland on their own. However, if the society were to share resources with other economic development and visitor development organisations in the city, it may be possible to fund a campaign outside of Scotland. This will be important from an economic impact perspective as, under government impact guidance, any expenditure by visitors living in Scotland must be treated as 'displaced spending' at a Scotland level. RZSS already do this, co-ordinating their marketing through a project activation group.

3.4.3 Development of 'China friendly' image for Scotland and Edinburgh

Given that China is the world's most populous nation, its 2nd largest economy, and one of its fastest growing economies, there is a widespread recognition of China's importance to Scotland not only as a trade partner, but also as a source of tourist visitors. There is therefore a view that Edinburgh and Scotland would benefit financially from any activities to enhance the experience of Chinese visitors to Scotland. These include:

- teaching all Scots who work in a visitor facing capacity in Edinburgh the basics of Chinese language and culture, including giving taxi drivers and hotel workers the ability to greet Chinese visitors in their own language
- helping to develop a sizable pool of Chinese speaking tour guides to guide Chinese visitors around the city's key attractions (including Edinburgh Zoo and its Panda enclosure) and, where such guides are not available, ensuring that recorded, Chinese language audio-guides are made available
- striving to develop a global reputation as a 'China friendly' destination, including by hosting large scale celebrations of key dates in the Chinese calendar.

3.4.4 Developing the supply chain

Edinburgh and Scotland could gain an enhanced 'multiplier impact' from any resulting visitor expenditure by working with hotels, restaurants and shops across the city, and by encouraging them to increase the amount of home produce products sold on their premises.

4 Impact findings

4.1 Introduction and overview of method

This section summarises the findings from our economic impact assessment of the Giant Panda Project. As part of our analysis we have considered the impact under four different scenarios, namely:

- **counterfactual case** – a hypothetical case where the panda project does not take place. This is needed to determine the value of the additional expenditure that the pandas could bring
- **minimum case scenario** – which assumes that the panda project goes ahead, but that there is no additional activity beyond the zoo itself, and that therefore minimal marketing activity takes place outside of Scotland and North East England (this assumes that all of the activities listed in Section 3.2, “opportunities for RZSS acting alone” take place, but nothing else)
- **limited impact scenario** – which assumes that the impact of the pandas is leveraged through limited additional activity delivered through individual, ad hoc activities by individual businesses and agencies (this assumes that, in addition to the above actions, all the actions listed in Section 3.3, “opportunities deliverable with ad hoc support” also take place)
- **panda premium scenario** – where there is a co-ordinated effort by a range of partners to fully exploit the visitor growth potential of the pandas (this assumes that, the above actions, together with those listed in section 3.4, ‘opportunities requiring city-wide strategic action’ all take place)

It should be noted that this analysis only considers economic impacts related to visitor expenditure. A more detailed study would be required to fully understand all of the other potential sources of economic impact that the zoo could bring to the city (including trade, research and development, quality of life and education).

Our approach follows HM Treasury's Green Book Guidance, and Scottish Enterprise's Guidance on Economic Appraisal, and is based on the assumption that net visitor expenditure will be equal to:

	Total number of visitors to the zoo
Less	Local visitors (displacement)
Less	Visitors who would have come anyway (deadweight)
Times	On and off site expenditure per visit
Less	Expenditure in non-local businesses (leakage)
Times	knock-on benefits (induced and indirect multipliers)

We provide a more detailed description of our impact analysis and findings in the accompanying technical report.

4.2 Data sources used

4.2.1 Counterfactual assessment

The counterfactual scenario draws evidence from the following data sources:

- **information provided by RZSS** – including the Edinburgh Zoo Visitors Survey, published accounts, and an analysis of UK visitor gift aid declarations. These supported our assumptions around visitor characteristics, including total visitor numbers, adult/non adult splits, and member/non-member split
- **tourism publications** – including the Edinburgh Visitors Survey and VisitScotland statistics. These supported our assumptions on the total amount that visitors spent during their stay in Edinburgh.
- **economic publications** – including the Annual Business Inquiry, the Scottish Tourism Multipliers Study and the HM Treasury GVA deflators resources. These supported our assumptions around the turnover to GVA ratio, average GVA per employee, inflation and the multiplier effect
- **appraisal guidance publications** – Including HM Treasury Green Book, which guided our assumptions around discounting and optimism bias

4.2.2 'with project' scenarios

In addition to the above information, the 'with project' scenarios also drew evidence from information provided by:

- **RZSS** – Including their own estimates of visitor numbers in the 'minimum case' scenario
- **Memphis Zoo** – including the findings from their own ex-ante economic impact assessment of their Giant Panda project
- **Zoo Atlanta** – including data on actual observed changes in visitor numbers, following the arrival of the Giant Pandas at their zoo

4.3 Issues, challenges and assumptions

This section outlines the areas in which assumptions or judgements needed to be made as part of this analysis, the reasons why these judgements were necessary, and the assumptions that were made. In all cases, the analysis erred on the side of caution when making these judgements.

4.3.1 Visitor numbers

One of the key challenges for this study, and one of the key drivers of the economic impact figure, is quantifying the number of visitors who will come to Edinburgh Zoo under each scenario. We have made the following assumptions here:

Counterfactual scenario

We have assumed that, in the absence of the pandas, visitor numbers to the zoo will remain unchanged at the levels they were at in the year leading up to the pandas arrival throughout the 2012 to 2021 period. This is not guaranteed to be the case, and visitor numbers fell in 2010.

Our assumption of a constant, rather than declining, trend in visitor numbers in the counterfactual scenario adds caution to our 'with project' impact figures, as it will mean that the difference between the 'with panda' and 'without panda' scenarios will be lower.

Minimum case scenario (with cubs)

Our assumptions are based on the projections provided by RZSS. We have been advised that these estimates are highly cautious, and are not dependent upon any supporting activities by partner organisations.

Limited impact scenario (with cubs)

Our assumptions are based on the estimates made by the University of Memphis as part of their own ex-ante economic impact assessment of the Memphis Zoo Panda Project. Their figures were drawn from their own experiences of hosting a panda in 1987, and on the more recent experiences of National Zoo Washington and Zoo Atlanta, the two most recent zoos to complete a ten year panda loan. The activities undertaken to promote the pandas at these three zoos all resembled those proposed under the limited impact scenario.

We believe that this provides the most suitable assumption, as it draws on the most rigorous and comprehensive research available. We also believe that the assumption is a cautious one as Edinburgh Zoo is a much smaller zoo than the three considered here. This means that, even though the size and capacity of the attraction is similar in all three cases (an enclosure hosting two pandas), the size of the increase in Edinburgh is assumed to be significantly lower in absolute terms. However, it should be noted that Edinburgh Zoo does have some competitive disadvantages over Atlanta, Memphis and Washington, including a less populous catchment area, shorter winter days and a poorer climate, and these have been accounted for in our optimism bias assumptions.

Panda premium scenario (with cubs)

The panda premium scenario includes a number of unprecedented activities that would be unique to Edinburgh. These include a City-wide Panda Day celebration and a joined-up, strategic approach to optimising the impact of the pandas involving all of the city's stakeholders. While we expect this scale of activity to bring new visitors to the city, there is little evidence available to quantify what the scale of this increase will be. We have therefore adopted a cautious approach, and assumed that the increase will be limited to 2.5%.

Without cub scenarios

The RZSS estimates for the minimum case scenario assumed the birth of a panda cub in late 2013 or early 2014, while the assumptions in the Memphis model assume three sets of births over the course of the loan, in line with Zoo Atlanta's experiences. While the two pandas at Edinburgh Zoo have both successfully bred with other pandas (though not each other), there is no guarantee that a cub birth will occur at Edinburgh, and there is therefore a risk that, in the absence of this additional draw, visitor numbers may be lower. We have accounted for this risk by developing three 'without cubs' scenarios. These assume that, after the initial increase in demand, visitor numbers will fall back to their original levels by year 10 of the project. This trend is consistent with patterns in visitor numbers observed in other zoos.

Table 4.1: Assumed visitor numbers under each scenario

Year	Counter-factual	Minimum impact (without cubs)	Minimum impact (with cubs)	Limited impact (without cubs)	Limited impact (without cubs)	Panda premium (without cubs)	Panda premium (with cubs)
2012	580,000	784,300	784,300	939,600	939,600	963,100	963,100
2013	580,000	620,600	620,600	805,300	805,300	825,400	825,400
2014	580,000	615,500	794,600	737,700	737,700	756,100	756,100
2015	580,000	610,500	672,800	715,200	715,200	733,100	733,100
2016	580,000	605,400	632,200	692,600	715,200	707,500	733,100
2017	580,000	600,300	632,200	670,100	715,200	682,000	733,100
2018	580,000	595,200	632,200	647,600	715,200	756,500	733,100
2019	580,000	590,200	632,200	625,100	715,200	631,000	733,100
2020	580,000	585,100	632,200	602,500	715,200	605,500	733,100
2021	580,000	580,000	623,530	580,000	681,400	580,000	698,400

Source: Frontline 2012, based on RZSS 2011, University of Memphis 2002

4.3.2 Treatment of deadweight

In the context of this study, deadweight will occur whenever a visitor travels to Edinburgh Zoo as part of a visit to Edinburgh, but where the visit to the zoo is not the primary driver of that visit. This will include, for example, trips to the zoo by people who went to the zoo as an unplanned 'day out' during a holiday in Edinburgh or Scotland, people who visited the zoo in their personal time during a business trip, or people who went to a zoo as part of a visit to see friends and family.

The best practice method for measuring deadweight is to directly ask zoo visitors to report the main reason why they visited Edinburgh and Scotland. However, this question was not asked in the Edinburgh Zoo visitors survey, and the timescales for this research were not sufficient to allow new primary evidence to be gathered. We would recommend that the survey questionnaire be amended to ensure this information is gathered in future. As a result, our research is based upon cautious estimates of deadweight, which we have agreed with Scottish Enterprise.

Table 4.2: Assumed deadweight under each scenario

	Counterfactual	Minimum impact	Limited impact	Panda premium
Scotland	90%	85%	80%	75%
England. Wales, NI	100%	95%	90%	85%
Overseas	100%	95%	90%	85%

Source: Frontline 2012, based on discussions with Scottish Enterprise

4.3.3 Visitor expenditure

For this study, we have taken a cautious approach of assuming that:

- only adult visitors will spend money as part of their visit to Edinburgh
- after accounting for inflation, expenditure levels per visit will remain unchanged on 2009 levels throughout the 10 year appraisal period
- any visitor to the Zoo who lives within a 60 mile radius will come to Edinburgh for a day trip exclusively to visit the zoo, and will not visit any other attractions in Edinburgh

Table 4.3: Assumed visitor expenditure under each scenario

	Counterfactual, minimum impact and limited impact	Panda premium
Scotland	£70.67	£74.20
England. Wales, NI	£212.00	£222.60
Overseas	£390.00	£409.50

Source: Frontline 2012, based on ONS and VisitBritain 2010

4.3.4 Optimism bias

All of the factors above constitute risks and uncertainties that could potentially cause the true impact of the project to vary from the numbers presented in this report. Therefore, while we have taken a cautious approach to all of these assumptions, we have also applied further caution through our optimism bias adjustments. In line with Green Book guidance, we have made our optimism bias assumptions proportionate to the number of 'unknowns' involved, applying a 20% adjustment for the unprecedented 'panda premium' scenario, a 5% adjustment for the 'no change' counterfactual scenario, and adjustments of 10% and 15% for the minimum case and limited impact scenarios respectively.

4.4 Zoo capacity considerations

Our findings have been sense checked with RZSS to ensure that the zoo has sufficient capacity to accommodate these numbers. This assessment took account of:

- limitations on the number of visitors the zoo can accommodate at any one time
- constraints posed by number of daylight hours during winter months
- capacity limits at the panda's indoor and outdoor enclosures

Based on these discussions, we concluded that the zoo will have sufficient capacity to accommodate the projected numbers of visitors under each scenario.

4.5 Findings

The economic impacts of the panda project are summarised in the table overleaf. It shows that, over the next 10 years:

- In the hypothetical situation where the panda project did not take place, Edinburgh Zoo would contribute **£13.743 million visitor expenditure** and **£6.459 million GVA** to the **Edinburgh** economy, and support the equivalent of **28 jobs**. However, it would remain a regional attraction, and would add **no net value to the Scottish economy**
- In our most pessimistic 'with project' scenario, where only the zoo takes action to promote the pandas, and the pandas do not produce any cubs, we estimate that:
 - an extra **£2.781 million of visitor expenditure** will be spent in the Edinburgh economy, with an extra **£1.468 million** spent in the **Scottish** economy
 - an extra **£1.307 million GVA** will be generated in **Edinburgh**, with an extra **£690,000** generated in **Scotland**

- the equivalent of **5 extra jobs** will be supported across **Edinburgh**, and **3** will be supported across **Scotland**
- In our most optimistic 'with project' scenario, where all of Edinburgh's tourism, events and economic development stakeholders work together to optimise the value of the pandas for the city, including the launch of a panda day celebration, we estimate that:
 - an extra **£27.637 million of visitor expenditure** will be spent in the **Edinburgh** economy, with an extra **£19,273 million** spent in the **Scottish** economy
 - an extra **£12.989 million GVA** will be generated in **Edinburgh**, with an extra **£9.058 million** generated in **Scotland**
 - the equivalent of **55 jobs** will be supported across **Edinburgh**, and **38** will be supported across **Scotland**

We note that the 'panda premium with cubs' scenario leads approximately to a three-fold increase in the economic impact of the zoo at the Edinburgh level. This is primarily due to the zoo becoming an international, rather than regional attraction (reflected through the changes to the deadweight visitor origin assumptions), and thus bringing in large numbers of international visitors to Edinburgh who would not come otherwise.

It should be noted that these figures relate only to the visitor expenditure related economic impacts of the project, and take no account of the trade benefits that the pandas may also bring.

These impacts demonstrate that the Giant Panda Project has the potential to support a substantial increase in tourism revenue both for the zoo itself, and for the economies of Edinburgh and Scotland as a whole. The figures also emphasise the economic importance of having a partnership based approach to maximising the impact of the pandas.

Table 5.1: Summary of impacts (2012 to 2021, PV)

	Counterfactual	Minimum case without cubs	Minimum case with cubs	Limited impact without cubs	Limited impact with cubs	Panda premium without cubs	Panda premium with cubs
	whole zoo impact	additional impact of panda project over and above counterfactual					
Total spend (Edinburgh)	£13,743,000	£2,781,000	£5,842,000	£13,800,000	£17,847,000	£22,248,000	£27,637,000
Total spend (Scotland)	£0	£1,468,000	£3,083,000	£9,018,000	£11,566,000	£19,273,000	£19,273,000
GVA (Edinburgh)	£6,459,000	£1,307,000	£2,746,000	£6,486,000	£8,388,000	£10,456,000	£12,989,000
GVA (Scotland)	£0	£690,000	£1,449,000	£4,238,000	£5,436,000	£9,058,000	£9,058,000
FTE employment (Edinburgh)	28	5	11	26	35	43	55
FTE employment (Scotland)	0	3	6	17	23	38	38

Source: Frontline, 2012

4.6 Value for money considerations

The Government's Green Book appraisal guidance recommends that an economic appraisal should consider the issue of value for money, based on both a cost per job indicator and a cost per £1.00 of GVA created.

However, we do not consider it appropriate to include such an estimate in this study because:

- at present, very little information is available as to what the costs to the Scottish public sector would be under each scenario, and therefore such an analysis would be speculative and potentially misleading
- any costs that do occur (including, for example, the costs of Panda Day) will support a project with a range of target outcomes, including outcomes related to trade, education, sustainability, culture and diplomacy, as well as visitor expenditure. Therefore using the total costs of such programmes as a denominator may lead us to overstate the costs attributable to the visitor expenditure objectives

5 Conclusions

5.1.1 A unique opportunity

In December 2011, two pandas, Tian Tian and Yang Guang, arrived at Edinburgh Zoo to begin their 10 year period of residence. As a result, Edinburgh became the smallest city in the world, outside of China, to house giant pandas.

This presents a unique opportunity for the city's economic development, visitor development, education and event stakeholders to work in partnership to attract new visitors to Edinburgh and to deliver a boost to the Edinburgh and Scotland economies.

As the report demonstrates, the pandas will generate a positive impact on visitor GVA as a stand-alone project, but it will be very limited. However even relatively modest increases in the visitor numbers coming to the Zoo as a direct result of the pandas have the potential to generate significant additional impact at the Edinburgh and Scottish levels.

The economic impact of the pandas will be dependent on the extent to which the zoo and the wider tourism community proactively develop and deliver additional activities based around the pandas. While it is beyond the scope of this study to define this activity, some suggestions have been made below, based on the consultations and experience from other panda zoos/destinations.

5.1.2 Options for the city

Our case study review identified examples of good practice activities that Edinburgh can replicate, including:

- **engaging the international media:** pandas are both rare and internationally popular, and there is a clear opportunity to position Edinburgh in the global spotlight by partnering with media companies overseas
- **corporate sponsorship:** brand association with the pandas can help businesses to obtain recognition on a global scale. As a result, previous panda loans have received significant financial investments from (amongst others) Paramount Pictures, Dreamworks Animations and FedEx
- **cub naming competitions:** under Chinese tradition, newborn cubs do not receive a name until 100 days after their birth. This provides an opportunity to sustain public interest in the cubs through a naming competition and naming ceremony
- **use of social media and on-line streaming:** including Facebook profiles for the pandas, panda loans and Youtube postings, all of which provide low cost opportunities for large scale dissemination
- **inclusion of other species:** using the pandas as a platform for a more ambitious 'China Zone' at the zoo
- **celebratory days:** a regular programme of marketed days to maintain interest in the pandas including, for example, the anniversary of their arrivals and the birthdays of each of the pandas

Other opportunities that could be developed through a co-ordinated, city wide partnership include:

- **Panda Day:** a city wide celebration honouring the pandas, and recognising their contribution to Chinese culture. This could have particular impact as a new winter event for the city, delivering additional visitors when both the zoo and the wider tourism community have spare capacity
- **conference hosting:** using the pandas as a platform to bring new conferences to Edinburgh, directly linking to the conservation, trade, science, education and cultural impacts of the project
- **business development:** proactively building partnerships between the Zoo and the wider tourism community, helping businesses in Edinburgh/Scotland to develop new products and promotional activity based around the pandas
- **engage with new markets:** product development and promotion to visitors who may not have seen Edinburgh as a primary destination historically, such as the family market
- **develop the emerging Chinese market** – utilise the pandas as a platform to raise awareness of Edinburgh with the growing Chinese market

5.1.3 Recommendations

The findings from this research illustrate both the potential value that the Giant Panda Project can bring to the Edinburgh and Scotland economies, and the importance of leveraging the asset through a partnership based approach. Based on these findings, we recommend that:

- SE should disseminate the findings from this study to tourism businesses across Edinburgh and Scotland, as a way of raising awareness of the scale of the opportunity, and encouraging businesses to make the most of this opportunity
- SE should work with other tourism and place marketing partners to identify ways of branding Edinburgh as a 'China friendly' place to visit and do business
- SE should work with RZSS and other partners to develop a new 'Panda Day' celebration in Edinburgh, starting in 2013
- SE should work with RZSS, the Scottish and UK Governments and other partners to encourage senior Chinese politicians to visit Edinburgh Zoo as part of any future state visits to the UK
- the Edinburgh Zoo visitor survey questionnaire should be updated to include questions on the role of the pandas in people's decisions to visit the zoo, the role of the zoo in people's decisions to visit Edinburgh and off-site expenditure
- further research should be conducted to explore the partnership, conservation, trade, science, education and cultural benefits associated with the project...
- a follow up study should be undertaken in 12 months time to assess the actual economic impact

Appendix 1: List of consultation participants

We are grateful to the following individuals for the information they provided and the views they expressed:

Name	Position	Organisation
Hugh Roberts	Interim Chief Executive	Royal Zoological Society of Scotland
Sharon Simpson	Marketing Manager	Royal Zoological Society of Scotland
Iain Valentine	Director of Animal Conservation and Research	Royal Zoological Society of Scotland
Grant Law	Project Manager – Giant Panda Project	Royal Zoological Society of Scotland
Councillor Tom Buchanan	Convenor of the Economic Development Committee	City of Edinburgh Council
Robin Worsnop	Chair	Edinburgh Tourism Action Group
Lucy Bird	Chief Executive	Marketing Edinburgh
Malcolm Roughead	Chief Executive	VisitScotland
Prof. Jeffrey Wallace	Professor of Applied Economics and Research	University of Memphis
Magnus Margerum	Vice President of Marketing and Sales	Zoo Atlanta
Christina Simmons	PR Manager	San Diego Zoo
Prof. Roy Ballantyne	Professor of Visitor Studies	University of Queensland