

Chapter 6 Assessing economic impact: case studies

6.1 Overview

This chapter provides an introduction to the case studies in Appendix 7, which contains outlines of 12 economic impact studies, each described under the following subheadings:

- Organisation
- Location
- Year studied and date of report
- Title and author/s of report
- Nature of study (including key issues explored by the study and data sources used)
- Region covered by the study (including an estimate of population of the region at the time of the study)
- Annual visitor numbers
- Annual operating budget
- Economic model/s used
- Conclusions reached

The 12 selected studies are from three countries—Australia, the United Kingdom and the United States—and each has a particular feature of interest: for example, the type of organisation that undertook the study, or the particular question that formed the basis of the study. However, it is beyond the scope of this project to provide detailed analyses or comparisons of the various studies presented here and the different approaches they have taken. For any study that seems particularly relevant to your own institution, more detail can be obtained by reading the full reports, several of which are available online. The outlines in Appendix 7 include authors and titles of the case study reports, and the bibliography has full publication details for each report, including internet addresses where relevant.

6.2 Economic impact of a group of institutions

The first three studies focus on groups of institutions, at the national, regional and city levels respectively. Data from within the institutions and from other relevant sources such as tourism studies are combined with an economic model relevant to the region where the study is taking place. In each case, the outcome is an estimate of the direct and indirect economic impacts that the institutions' combined operations have on the region's economy.

Case study 1: National museums and galleries throughout the United Kingdom

A study commissioned by the **United Kingdom's National Museum Directors' Conference** (NMDC) looked at the combined impact in 2003–04 of 29 national museums and galleries in various locations around the UK, including export income earned by the institutions.

The authors used desk studies, a major questionnaire and a number of round-table discussions with NMDC executives and directors. To estimate the spending by visitors to NMDC institutions, they used tourism data from several existing sources. To estimate the indirect and induced effects, they used multipliers ranging from 1.5 to 1.7, based on existing multipliers from several sources, including the British Arts Festival and the Treasury.

Case study 2: Museums and other institutions in the South West region of the United Kingdom

A study for the **United Kingdom's South West Museums Council** collated 1998–99 data from 153 institutions in the South West region of England and offered comparisons between different groups of institutions within the data set, as well as some comparisons with other sectors of the economy.

This study centered on data from a detailed questionnaire-based survey, which provided data for calculating the direct economic impact of the participating institutions. The number of tourist visits principally motivated by museum visiting, and the level of spending associated with these visits, were estimated using data from *Statistics and Tourism Research UK*. To estimate secondary economic impacts, the authors modified an existing input–output model developed for the region by the University of Plymouth's South West Economy Centre.

Case study 3: Nine museums in Chicago

A consortium of nine museums in one city—Chicago, Illinois, USA—commissioned a study of financial and visitor information for a three-year period 1996–1999 and used a regional input–output model to estimate the overall economic impact of the museums' activities.

As well as using attendance and financial data provided by the nine museums, the authors drew on data from the Chicago Convention and Tourism Bureau. To estimate secondary impacts, they used regional economic multipliers for the state of Illinois, developed by the US Economic and Statistics Administration and US Bureau of Economic Analysis.

6.3 Economic impact of a single institution

Case study 4: An attraction that is 'unique' within its region

The Tech Museum of Innovation in San Jose, California, USA is 'unique ... within the region', to the extent that the authors of the study report believed that visits by local residents might replace trips outside the local region, so that their visit-related expenditure might be validly considered as 'new' to the region (though they did not take this approach in their calculations).

The authors used visitor surveys at The Tech to establish the proportions of resident and non-resident (or 'tourist') visitors and details of their spending in relation to visiting The Tech. They used this data, together with a localised input-output model (based on a nationwide model) to generate estimates of the overall impact of The Tech on its region. They also estimated tax collections in the Santa Clara County attributable to The Tech.

Case study 5: One of many attractions in a region

Questacon – The National Science and Technology Centre in Canberra, Australia, is one of a number of significant tourist attractions in the national capital. This study illustrates two approaches to apportioning tourist expenditure among a number of attractions in one region.

One approach involved asking visitors to Questacon if they would have come to Canberra if Questacon were not there. The other used the proportion of time spent at Questacon in comparison with other attractions to apportion total expenditure by out-of-region visitors. An input-output model, developed for the local region by the University of Canberra's Centre for Tourism Research, was used to estimate downstream expenditure patterns in a range of economic sectors, based on exit survey data about visitor spending.

Case study 6: A newly opened major attraction

The **Eden Project in St. Austell, Cornwall, England** is, like The Tech, 'unique' in its region. Since its opening in 2001, The Eden Project has carried out a series of economic impact studies, building a detailed picture of the impacts that a new center can have on its immediate and wider regional neighbourhood—including explicit consideration of negative impacts. The Eden Project is the only institution identified by the current study that has started with a 'before and after opening' comparison and then built up a regular series of studies to track the ongoing economic impact of the additional visitors that it attracts to its region.

Data sources for the studies included The Eden Project's employment and expenditure records, visitor surveys, a business survey of Eden Project suppliers and tourism-related businesses, and county and regional level visitor spend information collected by various national survey sources. The author adapted *The Cambridge Tourism Economic Impact Model* to calculate the economic impact of visitors to The Eden Project.

Impacts were reported at several levels: for the local region, for the rest of the administrative district, for the entire county, for a neighbouring county, and for the rest of the South West region. In general, both positive and negative impacts were strongest in the local region and were weaker when a more distant or larger region was considered.

Case study 7: Economic value as well as economic impact

In 2002, the **Children's Museum in Indianapolis, USA** looked at economic value rather than just economic impact and did not use any multipliers.

To understand the economic value of free and reduced-cost visits, the study used the marginal cost to the museum of providing admission tickets for these visits. This marginal cost to the museum was estimated by subtracting relevant admissions revenue from the overall cost per visitor of operating the museum multiplied by the number of free or reduced-fee admissions.

Other approaches to estimating the value of free or reduced-cost admissions were suggested. For free admission, visitor surveys could establish what people would have done if they had not come to the museum, and the expenses associated with these activities could be used as a 'proxy measure of the implied benefit of free admission'. For school groups, an estimate could be made of the marginal savings to schools of not having children in school for that day.

6.4 Economic impact of a major change in a single institution

Case study 8: Impact of a proposed construction project

The National Aquarium in Baltimore, USA analysed its current direct and secondary economic impacts and its fiscal impact on the Baltimore city economy, and also looked at these impacts in relation to a proposed construction project, which would add up to 70,000 square feet (about 750 square metres) to the aquarium's facilities.

Data were obtained from the aquarium itself and also from the Maryland Department of Business and Economic Development (Business Research and Analysis Unit). All indirect and induced impacts were estimated using a Maryland-specific input-output model from the University of Minnesota's IMPLAN group.

Case study 9: Impact of relocation

Sci-Quest, the North Alabama Science Center (USA), is limited in what it can achieve by its location and the size of its facility, and explored the added economic impact that might result from relocating to a larger and more central location.

The author used industry data from the Association of Science-Technology Centers, the American Association of Museums and the Association of Children's Museums to develop projections for likely visitor attendance at a new facility. Based on projections of attendance and profit for 2004–10, direct and indirect economic impact estimates were made.

Data pertinent to Hunstville, Alabama, were used to construct a *LOCI III* model (a model, developed by the Georgia Institute of Technology, that assumes six spending cycles) to create a set of multipliers for the study.

6.5 Economic impact of events-based organisations

Case study 10: A 10-day science festival

The Australian Science Festival is an organisation responsible for an annual 10-day festival of science-based events, including exhibitions, theatre, debates, lectures and workshops.

The authors evaluated the 2003 festival and assessed its direct economic impact by using extensive surveys of event organisers and audiences, together with Canberra Tourism and Events Corporation data about daily spending by visitors to the region, and multipliers provided by Australian Capital Tourism. They did not attempt to calculate the number of jobs supported by festival activities, or to explore indirect and induced economic impacts.

Case study 11: Arts organisations around the USA

Americans for the Arts, a non-profit organisation for advancing the arts in America, commissioned a study of the economic impact of arts activities carried out by 3,000 non-profit arts organisations in 91 communities in 33 states of the USA. The study produced estimates of total expenditures by the organisations and of events-related spending by their audiences. The researchers also developed an online calculator that US-based arts organisations can use to estimate the economic impact of their activities.

6.6 Economic impact of a university

Case study 12: An Australian university

Many universities have carried out economic impact studies, which can be of interest because of their attempts to value activities that are hard to quantify. One such study relates to **Curtin University of Technology in Western Australia**, and illustrates an attempt to ascribe an economic value to 'enhancing human capital' and providing research for industries to build on.

The authors estimated the direct and indirect economic and employment generated in Western Australia through the university's activities. They used multipliers developed for Western Australia by the Economic Research Centre of the University of Western Australia.

The study also looked at the enhancement of the state's (and the nation's) human capital through its education of university graduates, by considering their extra income over a lifetime; and the report discusses four methods for estimating the dollar value of the spill-over benefits of its research to industry.

6.7 Finding patterns in the case study outcomes

The science center and museum case studies presented here did not fit a common pattern. They addressed a range of issues under the 'economic impact' umbrella, and did not all report their data or their conclusions in directly comparable terms. Thus they cannot be used as the basis for any broad generalisations.

It appears that, where multipliers were used to estimate indirect and induced impacts, they ranged from about 1.1 to over 5, but a detailed analysis of the significance of this range (e.g. by comparing underlying assumptions or economic models) is beyond the scope of this study. Also, it must be noted that the case studies were from only three countries: Australia, the UK and the USA; and that within the UK and USA studies at least, there was some overlap between studies in the sources of the economic models used to estimate the secondary impacts. We did not locate any data to indicate whether or not similar patterns might apply in the economies of other countries.

It would have been very satisfying to be able to develop a broadly applicable formula for calculating the economic impact of a science center, perhaps like that developed by Americans for the Arts and available at <http://www.artsusa.org/economicimpact/calculator.asp>. However, it was clear from our early research for this project that such a general tool was an inappropriate goal—economic impact on a region's economy depends too heavily on the nature of the local economy, and on the specific circumstances of the institution in question. The development of the Arts USA calculator was possible only because of the vast amount of detailed and consistent data underpinning it (information from 3,000 non-profit arts organisations and 40,000 audience members in 91 communities, spread across the USA, with a locally-based economic model developed for each community) and because all participants operated within a common larger economy—that of the USA as a whole. Even so, the calculator is accompanied by strong warnings that economic impact estimates obtained by using it are just that—estimates only.

The Arts USA calculator was designed for arts organisations planning events with a defined timeframe and not for institutions such as science centers, which have year-round visitors. Nonetheless, the figures from a small number of the case studies presented in this study were used as input for the Arts USA calculator as an exploratory exercise—with predictable results. The economic impact figures produced by the calculator did not relate in any regular way to those resulting from the calculations by the authors of the studies concerned. In some cases they were much larger, in others significantly smaller; only rarely were they similar, and then only for some of the results produced.

Thus the guidelines on planning and carrying out an economic impact study, presented in Chapter 7 of this report, do not offer any formulae for direct application to everyday data. Rather, that chapter outlines the process for such a study, highlights the decisions that need to be made in defining the study, and offers suggestions for some of the steps in carrying it out.

Appendix 7 *Case studies: economic impact of museums and science centers*

The following pages provide brief descriptions of 12 economic impact studies that have been carried out in recent years by institutions, or groups of institutions, in three countries: the USA, the UK and Australia.

Each case study is described under the following subheadings:

- Organisation
- Location
- Year studied and date of report
- Title and author/s of report
- Nature of study (including key issues explored by the study and data sources used)
- Region covered by the study (including an estimate of population of the region at the time of the study)
- Annual visitor numbers
- Annual operating budget
- Economic model/s used
- Conclusions reached

The currency quoted in each case study is that of the country where the institution or group of institutions is located. In some cases, the case study report did not provide all of the above data; where necessary, information on the population of the region was sourced elsewhere, and figures for an institution's annual operating budget or visitor numbers were obtained from the surveys submitted for the current project.

Case study 1 National museums in the United Kingdom

Organisation	National Museum Directors' Conference (NMDC), whose 29 members are national museums and galleries based in various locations around the UK
Location	United Kingdom
Year studied: Date of report:	Visitor data for 2002; financial data for 2003–04 March 2004
Title and author/s of report	<i>Valuing Museums. Impact and innovation among national museums</i> Tony Travers, London School of Economics and Stephen Glaister, Imperial College
Nature of study	<p>The authors used desk studies, a major questionnaire and a number of round-table discussions with key NMDC executives and directors.</p> <p>Their report summarises economic data for the 29 member organisations and goes on to estimate the total spending by visitors, the 'export' income earned and the overall impact, including indirect and induced effects.</p> <p>The report compares funding patterns for museums with those for the performing arts. It considers cultural and wider impacts of museums on the community as well as performance measures used to assess their 'success'.</p>
Region covered by the study	United Kingdom (focusing on the 29 NMDC member organisations and their regions) Population of the United Kingdom: 59,231,900 in 2002 ⁵
Annual visitor numbers	6.1 million children visited NMDC institutions in 2002; and 3 million people participated in formal learning activities on-site, with a further 5.6 million learners off-site.
Annual operating budget	NMDC institutions had a combined turnover of £715 million in 2003–04.
Economic model/s used	<p>The authors used data from a variety of sources: some were provided directly by NMDC institutions; figures for expenditure by UK museum visitors from a previous UK study based in the South West of England were adjusted to allow for higher costs in London; data on expenditure by overseas visitors were obtained from the Office of National Statistics.</p> <p>To estimate the effect of the direct expenditure on the wider economy, the authors 'err[ed] on the side of caution' and used 'multipliers of 1.5 to 1.7 to generate a range of plausible indirect and induced effects', based on multipliers suggested by the British Arts Festival Association (1.99), the Treasury (1.7) and the Wyndham Report for the Society of London Theatre (1.5).</p>
Conclusions reached	<p>Spending generated by NMDC visitors was estimated to be at least £565 million.</p> <p>The overall annual impact of the NMDC 'sector', including indirect and induced effects, is in the range £1.83 billion to £2.07 billion.</p> <p>The overseas 'export' of NMDC institutions is some £320 million a year.</p> <p>The report compares the rate of increase of grant-in-aid funding for NMDC institutions between 1997–98 and 2003–04 (under 19%) with growth in average earnings (34%) and growth in overall UK public expenditure (41%) and points to the gap between expected grant increases (5.2% for larger NMDC members) and projected overall government spending growth (13.9%) for the period to 2005–06.</p> <p>The report also considers the very wide range of roles and activities expected of the national museums and galleries—e.g. rejuvenation and regeneration, touring and exhibitions, creativity and innovation, academic excellence and education, good government and civic engagement—and provides examples of how individual institutions are meeting some of these expectations.</p>

⁵ <<http://www.statistics.gov.uk/cci/nugget.asp?id=6>> accessed 29 July 2004

Case study 2 Museums, libraries and archives in South West England

Organisation	South West Museums Council (now South West Museums, Libraries and Archives Council), covering 202 museums and other institutions throughout the South West region
Location	Taunton, Somerset, England
Year studied: Date of report:	Financial and visitor data for 1998–99 or calendar year 1998 May 2000
Title and author/s of report	<i>The Economic Contribution of Museums in the South West</i> Steven Brand, Peter Gripaos and Eric McVittie, South West Economy Centre, University of Plymouth Business School
Nature of study	<p>The study centered on data from a detailed questionnaire-based postal survey distributed to 202 institutions within the region. The survey achieved a 76% response rate.</p> <p>The survey information allowed an analysis of the indirect impact of museums etc on the South West regional economy, and provided a basis for modification of the University of Plymouth's South West Economy Centre's 'input-output' model for the region's economy.</p> <p>The authors also collated responses on expansion prospects, barriers and proposed solutions; and, where possible, compared the contribution of the museum sector with that of other 'industries' within the region.</p>
Region covered by study	The South West region of England (Cornwall, Devon, Dorset, Gloucestershire, Somerset and Wiltshire; and Bristol, South Gloucestershire, North Somerset and Bath and North East Somerset) Population: about 4.8 million
Annual visitor numbers	Over 4.8 million to all institutions covered by the survey
Annual operating budget	Operating expenses (excluding goods for resale) totalled nearly £10.3 million; wage and salary payments totalled nearly £13.3 million; and capital expenditure reached over £4.8 million.
Economic model/s used	<p>Direct economic impact data were collated from the information provided by institutions in their survey responses, and led to figures for total revenue, full-time equivalent (FTE) employment, household income (total of wages and salaries), and gross domestic product (GDP).</p> <p>The number of tourist visits principally motivated by museum visiting, and the level of spending associated with these visits, were estimated using data from <i>Statistics and Tourism Research (STAR) UK</i> as a starting point.</p> <p>The authors estimated secondary economic impacts by modifying an existing input-output model developed for the region by the South West Economy Centre.</p>
Conclusions reached	<p>South West museums received total income of around £29.1 million, of which the largest proportion (39%) was from UK public sector grants.</p> <p>About 71% of museum operating expenditure and about 63% of capital expenditure accrued to suppliers within the region.</p> <p>Every £1 output from South West museums generated an additional £0.74 output in other South West industries and each FTE job in museums supported 0.43 additional jobs elsewhere in the region</p> <p>Each £1 of GDP generated £0.61 of GDP in other sectors of the regional economy.</p> <p>Total museum-related tourist spending in the South West was £27.5 million, which supported around 680 FTE jobs and contributed about £13.5 million to the South West's GDP.</p>

Case study 3 A consortium of nine museums in one city

Organisation	Museums In the Park—a consortium of nine museums
Location	Chicago, Illinois, USA
Year studied: Date of report:	Financial data for 1996–99 and visitor data for 1996–2000 Winter 2001
Title and author/s of report	<i>Museums & the Economy: an Economic Impact Study of Museums In the Park</i> Metro Chicago Information Center (MCIC)
Nature of study	The authors analysed attendance and financial data provided by the nine museums for the period 1996–99 and also drew on parallel data for Chicago sports teams and Chicago tourism from the Chicago Convention and Tourism Bureau.
Region covered by study	City of Chicago and the State of Illinois (a high percentage of overall statewide economic activity is generated in Chicago) Population of Chicago: 2,896,000 in 2000 ⁶ ; population of Illinois: 12,419,300 in 2000 ⁷
Annual visitor numbers	8.7 million visitors in 2000
Annual operating budget	Direct spending by the nine museums in 1999 totalled \$206.3 million.
Economic model/s used	The authors used regional economic multipliers for the State of Illinois developed by the US Department of Commerce, the US Economics and Statistics Administration and the US Bureau of Economic Analysis, a model known as the Regional Input–Output System or RIMS II.
Conclusions reached	In 1999, \$206 million in direct spending by the nine museums generated approximately \$456 million in total output (direct spending plus successive rounds of re-spending) and \$180 million in personal earnings; and supported 10,900 jobs, of which 6,800 were in the museums themselves. In each of the four years covered by the study, the nine museums consistently attracted over 1 million more people than attended all major Chicago sports teams combined.

⁶ <<http://www.chipublib.org/004chicago/chifacts.html>> accessed 29 July 2004

⁷ <<http://www.census.gov/census2000/states/il.html>> accessed 29 July 2004

Case study 4 An individual science center—‘unique’ in its region

Organisation	The Tech Museum of Innovation
Location	San Jose, California, USA
Year studied: Date of report:	1999 May 2001
Title and author/s of report	<i>Economic Impact Analysis of The Tech Museum of Innovation on Santa Clara County</i> Morey and Associates Inc
Nature of study	<p>The authors used visitor surveys at The Tech to establish the proportions of resident and non-resident (or ‘tourist’) visitors and details of their spending in relation to visiting The Tech. They treated non-visitor revenues received by The Tech—interest income, public funding and other contributions—as additional expenditures on entertainment and attractions by non-visitors, on the basis that a substantial fraction of these funds come from outside the county.</p> <p>The study treated expenditure by visitors in a conservative manner, attributing to The Tech expenditure by visitors only on the day of their visit, even if they were visiting Santa Clara County for more than one day.</p> <p>The above data were used to generate estimates of the overall economic impact of The Tech on its region. The authors also estimated tax collections in Santa Clara County attributable to The Tech, relating to revenue from both visitors and non-visitors.</p>
Region covered by study	Santa Clara County Population: 1,682,600 in 2000 ⁸
Annual visitor numbers	Total 599,032, including 340,147 (nearly 57%) from outside Santa Clara County
Annual operating budget	Non-visitor revenues totalled \$6.7 million and visitor-related revenues were under \$6 million.
Economic model/s used	<p>The authors used a localised input–output model to estimate the indirect and induced economic impact of The Tech on the Santa Clara County economy. Their model was based on a nationwide model that shows the flows of goods and services from each of 469 industries to all other industries. The Santa Clara County version included 374 of these industries, and incorporated location quotients to allow for variations in concentration of each industry in the county as compared to the whole nation.</p> <p>The localised input–output model yielded output and income multipliers to allow calculation of indirect and induced economic impacts based on the data collected from visitors and from The Tech’s records. These multipliers ranged from 0.05 for the induced effect income multiplier for car rental to 28.17 for the indirect effect employment multiplier for restaurants.</p>
Conclusions reached	The authors concluded that, subject to their explanations and caveats, the impact of The Tech and its almost 600,000 paying visitors on Santa Clara County was \$44.2 million in economic output, \$14.8 million in personal income and 802 jobs.

⁸ <<http://www.fedstats.gov/qf/states/06/06085.html>> accessed 29 July 2004

Case study 5 An individual science center—one of a number of attractions in its region

Organisation	Questacon – The National Science and Technology Centre, one of a number of significant attractions in Australia’s capital city
Location	Canberra, Australia
Year studied: Date of report:	2002 September 2002
Title and author/s of report	<i>Questacon Research Project: Economic Impact Analysis</i> Brock Cambourne and Michele Cegielski, Centre for Tourism Research, University of Canberra
Nature of study	<p>The focus of the study was to estimate how much of visitor expenditure in the region could be directly attributed to Questacon. Two approaches were used:</p> <p>(a) Visitors to Questacon were asked whether they would have come to Canberra if Questacon were not there: all of those who would definitely cancel their trip and 50% of those who would reconsider their trip were taken as having Questacon as their primary motivator for visiting the region.</p> <p>(b) The proportion of time spent at Questacon in comparison to other attractions was used to apportion total expenditure by out-of-region visitors.</p> <p>For both methods, expenditure by local visitors was not considered, on the assumption that these people would spend their money in the region anyway. Information about how much ‘external’ visitors spent during their visit to the region, and on what, was obtained from exit survey data.</p> <p>Visitors coming in school groups or for organised functions were excluded from consideration.</p>
Region covered by study	The Australian Capital Territory (ACT) Population: 322,000 in 2002 ⁹
Annual visitor numbers	350,000 in 2001
Annual operating budget	Not mentioned in the study (the current project’s survey form reported operating expenses of nearly \$11.2 million in 2003–04)
Economic model/s used	The University of Canberra’s Centre for Tourism Research has developed an input–output model for the ACT economy. This was used to estimate downstream expenditure patterns in a range of economic sectors, based on the exit survey data about visitor spending.
Conclusions reached	The authors estimated that Questacon can be considered to have a minimum visitor expenditure impact of \$1.94 million (approach (a) above) and a maximum visitor expenditure impact of \$9.02 million (approach (b) above), taking into account only visitors who had independently purchased tickets, i.e. excluding school groups and visits for organised functions.

⁹ <<http://www.abs.gov.au/Ausstats/abs@.nsf/0/0ee487ad495671a9ca256e8a0077a3c1?OpenDocument>> accessed 29 July 2004

Case study 6 A newly opened center

Organisation	The Eden Project, a 110,000 m ² 'Living Theatre of Plants and People' which opened in 2001
Location	St Austell, Cornwall, England
Year studied: Date of report:	The first six months of the financial year in 2002–03; business survey carried out in 2001 October 2002 (This report follows an earlier study of the first eight months of the 2001–02 financial year.)
Title and author/s of report	<i>The Economic Impact of the Eden Project 1st April to 1st October 2002</i> Andrew Jasper (produced for The Eden Project in association with Geoff Broom Associates) ¹⁰
Nature of study	<p>The authors explored the impact of the influence that the Eden Project had on visitors' choice of holiday destination and calculated impact based on visitor spending at Eden; external effects arising from spending off-site by visitors to Eden; effects generated by the spending of wages by employees whose jobs are directly or indirectly supported by the visitor spending; the degree to which visitors were influenced by the Eden Project in their choice of holiday location; the degree of displacement caused by the project in attracting visitors away from existing leisure facilities.</p> <p>Data sources used for the report were the Eden Project's employment and expenditure records; visitor surveys carried out at Eden over several months during 2002; a business survey in 2001 of Eden suppliers; and regional or country-wide information from various national survey sources.</p> <p>The report includes detailed descriptions of the methodology and calculations used to assess a variety of impacts of the Eden Project on the South West region of England.</p>
Region covered by study	<p>The authors report on additional impacts at several levels: the local area (St Austell—population: 36 000 'today'¹¹); the rest of the Borough of Restormel (Newquay area total population 91,000—census 2001); the rest of the county of Cornwall (population: 501,267 in 2001¹²); the neighbouring county of Devon; and the rest of the South West region.</p> <p>Population of the entire South West region: 4,928,434 in 2001¹³</p>
Annual visitor numbers	1.39 million, of whom 85% were from outside the local area (data from this project's survey, as the economic impact study did not cover a complete financial year)
Annual operating budget	US\$28 million (also from this project's survey)
Economic model/s used	<p>Geoff Broom and Associates 'created and utilized a computer based economic model (<i>The Cambridge Tourism Economic Impact Model</i>) to calculate the value, quantity and economic impact of visitors to The Eden Project'. The model has been used for other tourism-based impact studies, and has been independently validated by Bournemouth University.</p> <p>The model uses information from a number of business surveys carried out in various locations in England on the relative impact of different forms of tourism expenditure.</p>
Conclusions reached	<p>For the South West region as a whole, during six months of the 2002-03 financial year the Eden Project has stimulated additional tourism activity (over 2.5 million visitor days); extra business turnover (nearly £177 million) and employment (nearly 5,500 jobs) and income (over £81 million) for local residents.</p> <p>The report provides economic impact figures for the local area and for the county of Cornwall as well as for the entire South West region.</p> <p>The business survey measured potential positive and negative effects on local tourism-related businesses, both increases and reductions in the number of customers and turnover; also improvements and a positive effect on the image of Cornwall, a worsening of traffic in some areas, and some increased difficulties of recruitment. However, the positive effects were, overall, stronger than the negative ones, and arguably the most significant effect was a lengthening of the tourist season.</p>

¹⁰ The summary on this page also draws on 'The Eden Effect. A snapshot of economic impact locally and regionally' (17 July 2003), a PowerPoint summary provided by Tony Kendle.

¹¹ <<http://www.localhistories.org/austell.html>> accessed 29 July 2004

¹² <<http://www.statistics.gov.uk/census2001/pyramids/pages/15.asp>> accessed 29 July 2004

¹³ <<http://www.statistics.gov.uk/census2001/pyramids/pages/k.asp>> accessed 29 July 2004

Case study 7 Going beyond economic impact to consider economic value

Organisation	The Children's Museum
Location	Indianapolis, Indiana, USA
Year studied:	2002
Date of report:	March 2003
Title and author/s of report	The Economic Value of The Children's Museum to Central Indiana's Economy and Identity: 2002 Results Professor Mark S Rosentraub, Cleveland State University
Nature of study	<p>The study focused on the direct economic value of the museum to the community, without using any multipliers. It evaluated six components of the museum's value: (1) direct expenditure by the museum, representing jobs for employees, contractors and suppliers; (2) spending by visitors to the museum, for example in hotels, other attractions, stores and restaurants; (3) the benefits relating to the educational experiences that the museum provides for school children and their teachers; (4) the 'free entertainment' provided for families and children on occasions when admission is not charged; (5) the economic value for local businesses and the museum's neighbours—an implied advertising benefit resulting from museum-related traffic in the area; and (6) the potential for generating substantial pride in the region for residents of the area.</p> <p>Data were obtained from the museum's records and from an August 2002 visitor survey.</p>
Region covered by study	Central Indiana Population: in the 800,000s
Annual visitor numbers	985,922
Annual operating budget	\$26 million; plus \$3.25 million in capital expenditure
Economic model/s used	<p>Data from the visitor survey were combined with information from the Indiana Convention and Visitors' Bureau on spending by tourists to generate estimates of the total direct spending attributable to museum visitors.</p> <p>To estimate the economic value to the community of free or reduced-fee admissions, the marginal cost to the museum of these admissions was calculated by subtracting relevant admissions revenue from the overall cost per visitor of operating the museum multiplied by the number of free or reduced-fee admissions. Two other methods were mentioned as possible ways to estimate the economic benefit of free and reduced admissions: (1) use visitor surveys to establish what people would have done if they had not come to the museum, and use the expenses associated with those activities as a 'proxy measure of the implied benefit of free admission'; (2) for school groups, estimate the marginal savings to schools of not having the children in school that day.</p>
Conclusions reached	<p>Expenditure by tourists, related to visits to The Children's Museum, was estimated at over \$18 million.</p> <p>The free admission programs (47,517 free admissions) and the reduced-fee school admission programs (126,122 admissions) were estimated to provide an economic benefit of over \$3 million (using 2000 figures).</p> <p>The museum earned \$385,000 in fees from its travelling exhibits, generating income to help support the programs provided for residents of Central Indiana.</p> <p>Also, visitors see The Children's Museum as the central element in the cultural identity of Indianapolis and Central Indiana, and residents include it among reasons for pride in living in the area. The report comments that 'The reputation ... and the pride produced for an area's residents by a civic asset can be as important or in some instances more robust than the economic benefits.' The reputation of the region is also enhanced by the display, in other parts of the country, of the museum's name on its travelling exhibits.</p>

Case study 8 A science center planning to expand its facilities

Organisation	National Aquarium in Baltimore
Location	Baltimore, Maryland, USA
Year studied: Date of report:	2001 April 2003
Title and author/s of report	<i>The Economic Impact of the National Aquarium in Baltimore</i> Dr Massoud Ahmadi, Executive Manager, Business Research and Analysis, Maryland Department of Business and Development
Nature of study	The study focused on the aquarium's expenditure during 2001 and on visitor spending outside the aquarium for transportation, lodging, food and other travel-related incidentals. Data were obtained from the aquarium itself and from the Department of Business and Economic Development, Business Research and Analysis unit.
Region covered by study	The state of Maryland Population: 5,386,000 in 2000 ¹⁴
Annual visitor numbers	1,630,000
Annual operating budget	\$30 million in operational expenditure plus \$14 million in employee income; about 301 full-time-equivalent (FTE) jobs.
Economic model/s used	All indirect and induced impacts of the aquarium were estimated using a Maryland-specific input-output model from the University of Minnesota's IMPLAN group. This model describes the inter-industry flow of goods and services within Maryland and with the outside economy.
Conclusions reached	The author estimated that the total—direct plus secondary—statewide impact of the aquarium in 2001 was about \$132 million in expenditure; \$53 million in employee income; and about 1,928 FTE jobs. The construction of the proposed Center for Aquatic Life and Conservation was projected to generate \$33 million in direct expenditure, \$10 million in direct employee income, and about 265 FTE jobs. The corresponding projections for total (direct plus secondary) impacts were \$55 million in expenditure, \$18 million in employee income and about 540 FTE jobs statewide. The direct annual fiscal impact of the aquarium was estimated at \$6.2 million in selected state and local tax receipts, and the secondary fiscal impact at \$1.2 million—a total of \$7.4 million. The total fiscal impact of the proposed construction project was estimated at nearly \$1.24 million in state and local tax receipts.

¹⁴ <<http://www.areaconnect.com/population.htm?s=MD>> accessed 29 July 2004

Case study 9 A science center considering relocating its facility

Organisation	Sci-Quest, the North Alabama Science Center
Location	Huntsville, Alabama, USA
Year studied: Date of report:	2003, with projections to 2010 May 2004
Title and author/s of report	<i>The Economic Effects of a Science Center. An in-depth study on the economic impact of Sci-Quest to the City of Huntsville's economy</i> Wesley Wright, Chief Development Officer, Sci-Quest
Nature of study	The author explored various factors associated with a proposed relocation to a more central downtown site, including strategies for attracting more visitors. Industry data from the Association of Science and Technology Centers, the American Association of Museums and the Association of Children's Museums were used to develop two predictions for likely visitor attendance at a new downtown facility. Attendance and profit projections for the period 2004–10 were developed, and direct and indirect economic impact estimates calculated.
Region covered by study	The city of Huntsville Population: 290,000 ¹⁵
Annual visitor numbers	53,749 in 2003
Annual operating budget	\$1.052 million
Economic model/s used	The study used data pertinent to Huntsville, Alabama to construct a LOCI III model (developed by the Georgia Institute of Technology) to create a set of multipliers for the project. Data for the model were provided by the US Bureau of the Census, Madison County Tax Assessor and Tax Collectors offices, the State of Alabama Department of Revenue and the City of Huntsville. The author noted that the multipliers generated by the LOCI III model assume six spending cycles, 'sometimes making the multipliers more robust than the actual effects.' Projections to 2010 assumed a market growth rate of between 4% and 7% annually, based on data from the US Bureau of the Census, and took into account traffic count data and daily capture information for Sci-Quest's current location.
Conclusions reached	A multi-regression model showed that for large centers, attendance tends to be proportional to interior public space, but that this relationship is less useful for small centers (like Sci-Quest). A market penetration analysis suggested that Sci-Quest's performance was generally comparable to that of other similar centers/museums, and the author identified a number of ways in which the capture ratio could be improved to increase visitor numbers if Sci-Quest were in a downtown location. The economic impact analysis resulted in an estimated secondary impact of nearly \$1.21 million, i.e. a total economic impact of about \$2.26 million (with a multiplier of 1.1475 for each of the six rounds of spending considered in the model). The overall conclusion was that while Sci-Quest 'will never become self-sustaining, a larger facility would allow for more earned income, near or at 60% of annual cost of services [compared with the current 50%], in addition to an added annual economic impact of over \$500,000.'

¹⁵ Personal communication: Wesley Wright, November 2004

Case study 10 Economic impact of a science festival

Organisation	Australian Science Festival (ASF) Canberra, which organises an annual 10-day festival of science events in and around Australia's national capital. The 2003 festival comprised 142 events with over 190 organisations participating in and/or sponsoring festival activities.
Location	Canberra, Australia
Year of study: Date of report:	2003 December 2003
Title and author/s of report	<i>2003 Australian Science Festival—An Analysis of Surveys of Stakeholder Groups and Visitors</i> Professor Des Nicholls and Christina Jankovic, School of Finance and Applied Statistics, Faculty of Economics and Commerce, Australian National University ¹⁶
Nature of study	The study used data from eight surveys: face-to-face interviews with audience members at two major festival events; and survey forms completed by event holders, school teachers, 'expo' exhibitors, workshop participants, theatre managers and participating panellists/performers. The survey questions sought qualitative feedback on festival events and festival staff (both 'front-of-house' and management), festival facilities and timings, event budgets and advertising awareness among audiences, and also explored audience demographics and expenditure patterns.
Region covered by study	Australian Capital Territory (ACT) Population: 322,800 ¹⁷
Annual visitor numbers	100,615 in 2003, of whom about 17% were from outside the ACT
Annual operating budget	\$AU1.3 million (ASF budget; does not include expenditure by organisers of individual events)
Economic model/s used	Together with direct expenditure data from the surveys, the authors used information from the Canberra Tourism and Events Corporation about daily spending by visitors to the ACT; and multipliers provided by Australian Capital Tourism.
Conclusions reached	The authors concluded that the total expenditure by festival event organisers and audiences within the ACT was nearly \$AU6.5 million. They did not attempt to calculate the number of jobs supported by festival activities, or to explore indirect and induced economic impacts. For nearly 77% of respondents at one event, the festival was a factor in choosing to visit Canberra.

¹⁶ This summary also draws on an information kit provided by festival organisers.

¹⁷ <<http://www.abs.gov.au/Ausstats/abs@.nsf/0/06d43402866a696bca256ec300029ce5?OpenDocument>> accessed 29 July 2004

Case study 11 Economic impact of arts organisations in the USA

Organisation	Americans for the Arts, a 'non-profit organisation for advancing the arts in America'
Location	Washington DC
Year studied: Date of report:	Financial data for 2000; audience spending data collected during 2001 2003 (date of publication of full report)
Title and author/s of report	<i>Arts & Economic Prosperity. The Economic Impact of Nonprofit Arts Organizations and Their Audiences</i> Americans for the Arts
Nature of study	<p>The study collected data from 3,000 non-profit arts organisations and 40,000 audience members in 91 communities, spread across the USA.</p> <p>The organisational survey identified organisation type, attendance figures, expenditure (salaries, payments to artists and operating/overhead expenses; facilities-related expenses; and capital and asset acquisition costs), amount and type of volunteer work, and sources and values of in-kind support received.</p> <p>The audience survey covered travel, accommodation and spending details, and also explored some of the demographics of those surveyed.</p>
Region covered by study	USA: 33 states and the District of Columbia; the communities studied ranged in population from 4,000 to 3 million.
Annual operating budget	Total spending during fiscal year 2000 by non-profit arts organisations within one community ranged from \$489,000 (community population 31,392) to nearly \$249 million (community population 951,000).
Economic model/s used	The project economists, from the Georgia Institute of Technology, customised input-output models for each of the 91 communities 'to provide specific and reliable economic impact data about their non-profit arts industry.' The starting point was a table showing inter-industry purchase patterns for the US economy for 1992. This was reduced to reflect the size and mix of industries in the local economy of each participating community, using county and regionally based information, and was adjusted to show only local transactions in the inter-industry part of the table. The final tool used was an aggregation reflecting the activities of 32 industries plus local households. (Page 16 of the report details the calculations needed to arrive at total impact figures using this 33 x 33 matrix.)
Conclusions reached	<p>'Because of the variety of communities surveyed and the rigor with which the study was conducted, national estimates of the impact of the nonprofit arts industry can be extrapolated.' This extrapolation led to estimates for:</p> <ul style="list-style-type: none"> • total expenditures (\$134 billion) by arts organisations (\$53.2 billion) and event-related spending by their audiences (\$80.2 billion) • the number of full-time equivalent (FTE) jobs supported by the activities of arts organisations (4.85 million) • household income generated (\$89.4 billion) • total government revenue delivered to local, state and federal governments (\$24.4 million). <p>Another product of the study was the <i>Arts & Economic Prosperity</i> calculator at http://www.artsusa.org/economicimpact/calculator.asp, which allows arts organisations in the USA to estimate the likely economic impact on their communities of their activities, based on the size of the community's population, the organisation's annual budget, and the size of the audience. The calculator produces estimates for total audience expenditure, number of FTE jobs supported, and revenues flowing to local and state governments.</p> <p>See Chapter 6.7 of this report for further discussion of the <i>Arts & Economic Prosperity</i> calculator.</p>

Case study 12 Economic impact of a major Australian university

Although this case study does not relate to a science center or museum, or to a specifically science-focused activity, it is included here as an illustration of an attempt to quantify some of the more 'qualitative' impacts of an educational institution, including the increase in human capital resulting from education at the tertiary level.

Organisation	Curtin University of Technology
Location	Perth, Western Australia (WA), Australia
Year of study: Date of report:	Financial data for 1996; student and staff survey carried out in 1997 June 1999
Title and author/s of report	<i>Contributing to the Community Through Education and Research. Quantifying the Economic Impact of Curtin University of Technology on the WA Economy</i> H Cabalu, T Desai, N Doss, Professor P Kenyon, P Koshy and J Trotter, The Institute for Research into International Competitiveness, Curtin University of Technology
Nature of study	<p>The authors considered three aspects of the university's impact on the state of Western Australia:</p> <ul style="list-style-type: none"> • the direct and indirect income and employment generated in the state through its activities, including the generation of export income • the enhancement of the state's (and the nation's) human capital through its education of university graduates • the creation of wealth through the spill-over effects to government and business of its research and development activities. <p>University records provided data on staff numbers, total operating revenues and total expenditure. Postal surveys elicited information about expenditure by students (local, international and external), and consultancy income earned by staff. WA Tourism Commission and <i>WA Travel Survey</i> data were used to help estimate living expenses for overseas and interstate students and their visitors.</p>
Region covered by study	The state of Western Australia Population: 1,871,000 in 1999 ¹⁸
Student numbers	About 24,500 students and about 2,500 staff
Annual operating budget	\$24.3 million for staff costs, non-wage purchases and net capital expenditure
Economic model/s used	To calculate the indirect impacts of the university's activities, the authors used multipliers developed for WA by the Economic Research Centre of the University of Western Australia. The multipliers used were 1.58 for expenditure and 1.73 for employment.
Conclusions reached	<p>Expenditure by students totalled about \$63.8 million, international visitors contributed about \$5.1 million, and staff contributed about \$1.71 million as consultancy income. The total direct contribution of \$274.9 million translated to a total direct-plus-indirect contribution of \$434.3 million to the state's economy.</p> <p>The university's activities generated 2,364 jobs directly and a further 1,617 jobs indirectly, elsewhere in the economy.</p> <p>The study also analysed the benefits of a university education in terms of extra income over a lifetime, and concluded that 'for every dollar that the government contributes to a student's education, it gets back \$1.15 in additional (discounted) tax revenue from the enhanced salaries achieved as a result of a Curtin University education.' The authors noted that 'for every dollar invested in their education, [Curtin University graduates] will receive an additional (discounted) lifetime return of \$3.16'.</p> <p>The authors also estimated that, over and above the direct and indirect impacts already mentioned, the university generates a further \$65 million in spill-over benefits of its research to industry. The report discusses four methods for making this estimate, and presents a number of illustrative case studies.</p>

¹⁸ <<http://www.abs.gov.au/Ausstats/abs@.nsf/0/866b65f503456282ca2569b600016750?OpenDocument>> accessed 29 July 2004