

**SMALES FARM TECHNOLOGY OFFICE PARK:
A Social and Economic Impact Study**

A Report Prepared for Smales Farm Technology Office Park

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February 2004/1

ACKNOWLEDGEMENTS

This research project is in association with the Labour Market Dynamics Research Programme which is funded by the New Zealand Foundation for Science Research and Technology from the Public Good Science Fund. We acknowledge this support.

We would particularly like to thank all the participants in the study who gave generously of their time - their insights and comments have been tremendously helpful and greatly valued. We would also like to thank Lisa Petersen for the many hours she spent transcribing the interviews.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	2
1. INTRODUCTION.....	4
2. CONTEXT.....	5
2.1. SOME FACTS ABOUT NORTH SHORE CITY	5
2.1.1. <i>Education</i>	5
2.1.2. <i>Business and Employment</i>	6
2.2. THE BUILT ENVIRONMENT - OVERSEAS FINDINGS.....	6
3. TECHNOLOGY PARKS: AN OVERVIEW	10
4. METHOD	12
5. QUANTITATIVE RESEARCH FINDINGS	13
5.1. OBJECTIVE	13
5.1.1. <i>Approach</i>	13
5.2. ECONOMIC IMPACT ANALYSIS	13
5.2.1. <i>Method</i>	13
5.2.2. <i>What is a Multiplier?</i>	14
5.3. ASSUMPTIONS	15
5.3.1. <i>Assumptions used in estimating the output impacts</i>	15
5.3.2. <i>Assumptions used in estimating the employment impacts</i>	15
5.3.3. <i>Assumptions used in estimating the expenditure impact</i>	15
5.3.4. <i>Assumptions used in estimating the fiscal impact</i>	15
5.4. RESULTS	16
5.4.1 <i>Output Impact</i>	16
5.4.2 <i>Annual Employment Impacts of a Fully Completed Park</i>	16
5.4.3. <i>Expenditure Impacts</i>	17
5.4.4 <i>Fiscal Impacts</i>	17
5.5. CONCLUSION.....	18
6. QUALITATIVE RESEARCH FINDINGS	19
6.2 THEMES	19
6.3 THEME 1 – RELATIONSHIPS.....	20
6.4 THEME 2 – HI-TECH ASPECTS.....	22
6.5 THEME 3 – TRANSPORT.....	24
6.6 THEME 4 – LOCATION	25
6.7 THEME 5 – AMENITIES	27
6.8. THEME 6 – CRITICAL MASS	29
7. SUMMARY	31
8. REFERENCES.....	32
APPENDIX 1.....	34

1. INTRODUCTION

Massey University has been commissioned by Smales Farm to provide an assessment of the economic and social impact that the fully developed Smales Farm Technology Office Park (SFTOP) will have on North Shore City (NSC) and New Zealand.

SFTOP is located on the North Shore of Auckland at the intersections of Taharoto Road, Northcote Road and the Northern Motorway. It is situated on a 12 hectare site owned by the Smale family. Currently, there are two large buildings on the site but on completion, up to 13 buildings will provide about 100,000 m²¹ of office space² and accommodate up to 7,000 people.

The aim of SFTOP is to provide spatially contiguous buildings and offices to businesses in order to encourage business relationships and the exchange of information and knowledge. On completion, SFTOP aims to become a leading centre in New Zealand for technology-based industries and knowledge-based economic development. SFTOP has an established association with Massey University (Auckland) and the Smale family has extensive networks with other education and training providers.

Located on the North Shore of Auckland, a technology park of this nature provides numerous advantages to current and prospective tenants. The following section summarises some of the business and demographic statistics of North Shore City, highlighting the area as a desirable location for knowledge and creative industries. We then address a number of overseas findings relating to the built environment and economic development and provide an overview of technology parks and their importance for economic development in creative economies before assessing the economic and social impact of SFTOP in particular.

¹ Some estimates suggest that the completed park could be about 115,000m².

² According to the annual survey undertaken by Bayleys Research (January 2004), North Shore City's total commercial space is 252,000 m².

2. CONTEXT

2.1. Some Facts About North Shore City³

North Shore City (NSC) is the fourth largest city in New Zealand and in the year to March 2002, NSC's economy grew 4.7 percent - the fastest growing economy within the Auckland region, which generates one third of New Zealand's income. This has been recognised by the North Shore City Council (NSCC) and in its economic development strategy plan, the Council's proposed approach is to make NSC a 'world-class business location for knowledge and creative industries recognising these industries make comparatively few demands on the environment'. The objective is to balance social, cultural, environmental and economic priorities on a sustainable basis to create economic wealth. Given that NSC's projected population growth between 2001 and 2021 is 38 percent (as opposed to 20.6 percent in the whole of New Zealand), a well-planned strategy of economic development is essential.

The population is ethnically diverse and Asian people now comprise NSC's second largest population group with people from China being the largest group followed by Koreans. NSC is an attractive destination for international immigrants and those from elsewhere in New Zealand. One of the growing concerns, however, is the loss of 25-29 year olds which represents a significant human capital loss.

2.1.1. Education

One of the most significant contributors to economic growth is the educated and skilled workforce in NSC. Almost three-quarters of NSC students attend decile 9 and 10 schools (72 percent) compared with 33.8 percent of the total 8 New Zealand cities⁴ recently surveyed in relation to the quality of life in those cities. Furthermore, NSC had the lowest proportion of school leavers without qualifications between 1998 and 2001 in the Auckland region. Almost 15 percent of the residents have degrees compared with 10 percent nationally.

In the Auckland region, NSC has the highest median household income of \$53,355 and the lowest number of beneficiaries. House ownership too was highest in 2002 - 66.2 percent - compared to the national average of 63.9 percent.

³ This material has been drawn from the following sources: Quality of Life '03 in New Zealand's eight largest cities; North Shore Quarterly Review; Developing the North Shore, Strategic Considerations; North Shore City Economic Development E-news; North Shore City Council Economic Development Strategy and North Shore City's Business and Economy 2003.

⁴ New Zealand's 8 largest cities are North Shore, Waitakere, Auckland, Manukau, Hamilton, Wellington, Christchurch and Dunedin.

2.1.2. Business and Employment

Of the eight cities, NSC saw the greatest economic growth between 1998 and 2002 with an average growth of almost 6 percent per year although the bulk of this occurred between 1998 and 2000. Over the same period (1998 and 2002), the growth in the Auckland region was 3.4 percent per annum. Moreover, NSC recorded the highest growth rate in numbers of businesses between 1998 and 2002 (29.3 percent) as opposed to 21.4 percent in New Zealand. In February 2003, there were 19,477 businesses in NSC, an increase of 990 businesses over the previous year. Moreover, the percentage growth in the number of economically viable businesses (1998 to 2002) was 29.3 percent for NSC compared with 20.6 percent nationally. Information technology is becoming an important component of this economic development. As a contrast to New Zealand as a whole (4.7 percent), employment growth in NSC has been most significant at 12.8 percent over two years between 2000 and 2002.

NSC tends to have a service-based economy and one-third of all jobs are in the distribution and hospitality industry. Because of the presence of a skilled and educated workforce, NSC is one of the best-educated and skilled communities in New Zealand and an attractive destination for companies looking to locate (or relocate) their businesses. It is important to provide the job opportunities for this skilled labour force in high technology fields.

According to Bayleys Research⁵, in January 2004, NSC's office vacancy rate was 6.8 percent which compared favourably with that of the Auckland CBD (11.95 percent), the city fringe (9.7 percent) and the southern corridor (6.9 percent). Takapuna's overall office vacancy rate was 3.15 percent.

Before we examine some of the literature on technology parks, we highlight ideas on sustainable development and the importance of urban design and so-called 'long-termism' to sustainable development.

2.2. The Built Environment - Overseas Findings

The following findings outline overseas research on sustainable development, quality urban design and the issue of 'short-termism' (versus long-term planning and development). These findings emphasise the importance of relationships between the public, businesses, developers and local and central government in achieving outcomes that promote enhanced physical, economic, social and environmental value. The issue of 'short-termism' relates to the detrimental effects of adopting a planning and development time-frame which is focussed on immediate issues rather than a long-term approach in respect to property and economic development. There are significant advantages to considering the range of human skill development, community interests, economic development and environmental issues in a longer time-frame. SFTOP embodies a long-term development focus.

⁵ Personal communication with Cameron Melhuish (25th February 2004)

2.2.1. Sustainable Development

In the report ‘Agenda 2003: Where next for sustainable development?’ (Sustainable Development Commission, 2003) the need to communicate ‘sustainable development’ is discussed. The report notes that:

“One problem is that the vast majority of senior professionals in the UK acquired their qualifications when sustainable development was seen to be the preserve of woolly-hatted, tree-hugging weirdos for whom most professionals had a profound aversion. Now, the inherent conservatism of many of their professional bodies and institutions is one reason for their failure to keep up with the mainstreaming of sustainable development and its centrality in dozens of public policy areas. A major education job is required” (Sustainable Development Commission, 2003:3)

The report also states that while both business and the general public are critical in making sustainable development happen, in practice, the greatest responsibility to demonstrate commitment and action on these issues lies with the government (<http://sd-commission.gov.uk>).

2.2.2. Quality Urban Design

Published in 1998, an article titled ‘Private Property Decision Makers and the Quality of Urban Design’ (A. Rowley, 1998) discusses a research project carried out in the United Kingdom. The article argues that lasting improvements in the quality of the urban environment can be achieved by a better understanding of the relationship between urban design, the development process and the property industry. Factors that influence urban design include:

- Occupier, investors or buyers requirements, preferences and priorities.
- The timing of the development related to market conditions and the business cycle.
- Land ownership, costs and values.
- The size of the project and the timescale for the development.
- The role, contribution and general attitude of the public authorities toward a particular development.

A more recent article, titled ‘What Value Urban Design’ (M. Carmona, C. de Magalhaes and M. Edwards, 2002), details findings of a study that investigated the relationship between better urban design and enhanced economic, social and environmental value. The study concluded that better urban design adds value by increasing the economic viability of development by delivering enhanced social benefits and by encouraging more environmentally sensitive development. Of particular relevance were the following points:

- Scale is a crucial element in the success of a development – larger developments are more likely to incorporate good urban design.
- While in some respects, better design is likely to increase value, in others it may increase costs that may or may not be compensated for by the increase in value. Such costs accrue directly or indirectly to stakeholders and can be both tangible and intangible in monetary terms.
- Costs can also be viewed as a price that poor quality or inappropriate development can potentially impose on society. For example the ‘value for money’ concept

associated with volume-built speculative housing fails to consider the social costs of poor health, crime, commuting that eventually fall on the public purse.

- Developers need to retain a stake in their developments if they are to benefit from the healthy financial returns that the better urban designed developments offer in the medium to long term.
- Good quality design can reduce security, management, maintenance and energy costs but such costs need to be supported by enough critical mass to avoid being a burden on investors or – via service charges – on occupiers.
- Few stakeholders understand the potential environmental contribution of good urban design beyond the impact of land recycling and the construction of more energy efficient buildings.
- Environmental benefits were only considered and delivered on the basis of perceived occupier demand – such demand existed primarily at the higher end of the market, as environmental measures increase up-front construction costs.

An article, ‘Stakeholder Views on Value and Urban Design’, by the same authors (2002), argues that design quality can be improved by local authorities turning their working practices from reactive to proactive modes of working. They also emphasise the importance of strong and proactive sector guidance on urban design in bridging the gap in stakeholder interests.

A UK government report (‘Towns and Cities: Partners in Urban Renaissance Project’, Urban Policy Unit, Office of the Deputy Prime Minister, 2002) stresses the importance of monitoring, helping and supporting progress across all aspects of urban renaissance, including physical, economic, social and environmental aspects. Findings from ‘Property Workshops’ with property developers and other professionals identified the following points:

- There is a need for training and education amongst those involved in urban renaissance.
- The planning system needs to be more efficient and quicker to respond.
- Better partnership arrangements need to be established between the public and private sectors.

2.2.3. The Importance of ‘Long-termism’

A conference paper presented to the Royal Institute of Chartered Surveyors in the United Kingdom (‘Does short-termism affect the quality of urban design in the United Kingdom’ by V.A. Gibson, A.R. Rowley and C.W.R Ward, 1996) argues that ‘short-termism’ influences urban design and property-oriented decisions. In particular, the paper contends that:

- One of the main factors that might constrain the creation of good urban design is the possibility that all decision-makers may take too short-term a view.
- It is suggested that the standard of urban design is improving and that this is associated with partnerships between private and public sectors or schemes that are sufficiently large that the developer takes responsibility for aspects of urban design.
- The pressure of time in the design and development stage often squeezes out consideration of urban design issues.
- Site acquisition valuations and costs often underestimate the full costs of achieving sustainable urban design.
- Though one outcome of good urban design is tied up with increasing the economic life of the property, this becomes irrelevant in a world where the planning horizons of developers, investors and occupiers span only three to five years.

- The property sector has many examples in which inertia, at either an institutional or professional level, has been associated with a perceived inflexibility and resistance to change.

The authors also argue that if successive governments legislate and regulate the environment in ways that are driven by short-term considerations, the consequences are likely to be manifested in short-term distortions in the property market.

The previously mentioned article titled ‘Stakeholder Views on Value and Urban Design’ (M. Carmona, C. de Magalhaes and M. Edwards, 2002) raises a number of further issues. In particular, to optimise urban design solutions, it seems desirable that all those concerned need to have a stake in the long-term success of developments – this does not always happen with some developers selling out before the multiplier regeneration effects of their successful developments are fully reflected in the local market values. Such an occurrence is a common feature of the development industry in the UK, and elsewhere, and effectively undermines the incentive for developers to value better urban design and represents a continuing barrier to design improvement.

2.2.4. Relevance to Smales Farm Technology Office Park

The significance of these findings to SFTOP is particularly evident when juxtaposed with the qualitative interview findings discussed in section six of this report. In particular, the overseas findings outlined above illustrate that the proposed and achieved outcomes of SFTOP present various tangible and intangible benefits in the form of sustainable development, quality urban design and a long-term approach, all of which adds to the growth and value of a region.

3. TECHNOLOGY PARKS: AN OVERVIEW

There are many theories about what makes regional development and growth successful and what might stimulate this in a regional economy. Two of the most popular, namely creativity and technology, will be examined here. Firstly, attracting creativity in all its dimensions is seen to be an important factor for sustained economic growth. The concentration of creative communities does not happen by accident and Florida (2002) outlines three principal forms of creativity that attract creative capital in its many manifestations:

- Technological creativity which includes innovation, new products and new ideas;
- Economic creativity which includes entrepreneurship and the creation of new businesses and industries; and
- Cultural creativity which is the ability to invent new ways of thinking, new art forms, designs and concepts.

Florida suggests that those areas which are attractive to creative people are also the centres of innovation and high-technology developments. Given the demographic characteristics of the North Shore, the key ingredients are all present as a basis for promoting a creative sector and enhancing economic development. High technology industries are an essential component in this.

A review of the large body of literature indicates that there is a growing consensus that the long-term economic development prospects in most developed countries lie in a concentration of innovation and technologically orientated business enterprises in a region (Luger and Goldstein, 1991) and that these industries are often located in specific areas like SFTOP. Several terms are used to describe 'local initiatives to stimulate investment in high-technology activities' (Komninos, 2002: 55), including 'Research', 'Science' and 'Technology' Parks or 'Business' incubators and Komninos (2002) differentiates these as follows:

- A research park is usually located close to a university⁶ or similar research organisation and the emphasis is on research rather than development with the key being the liaison between academia and research at the leading edge of science and technology;
- A technology park is a development to accommodate companies engaged in the commercial application of high technology, with activities including R&D, production, sales and servicing. Academic involvement is also essential; and
- Business incubators, such as the Massey University e-centre, are places where newly created firms are located in one space with the aim of enhancing the chances of growth and the rate of survival of these businesses by providing them with facilities and managerial support.

Komninos (2002) continues that science and technology parks include the following four components:

- A property-based initiative;
- Formal links with a university, higher education institution or research centre;

⁶ See also www.aurrrp.com which is the website for the Association of University Research Parks

- Is designed to encourage the formation and growth of knowledge-based businesses; and
- Has a management function that is actively engaged in fostering the transfer of technology and business skills to the organisations on site.

Our focus in this report is on the role of a technology park, usually designed to accommodate firms in the commercial application of advanced technologies (Grayson, 1993). These technology parks form part of what Komininos (2002:11) describes as an 'intelligent city' which is a spatial entity that offers an environment for technical innovation based on clusters or technology parks and a digital capacity to manage and diffuse that knowledge and technology.

The success of technology parks, therefore, is dependent on a myriad of factors such as:

- A sufficient population to support economic activity;
- Organisational characteristics of organisations in the park;
- The tenant mix in the park;
- Incubator facilities;
- Leadership and long-term commitment of the host institution; and
- Strong external linkages that develop between the technology park and organisations and, education and training providers which enhance skill development and job opportunities.

Furthermore, several locational factors are important for the optimum benefit of the parks for the community and according to Badarulzaman (1998) these are:

- Good transportation;
- Good telecommunication system;
- Availability of skilled labour;
- Good political climate. Local government is particularly important in this regard.

The following section looks at the methodology in this report to assess the economic and social impact that SFTOP has on the North Shore region in particular, as well as New Zealand. 'Signature' projects like SFTOP encourage the continued growth of core knowledge-based businesses in a region.

4. METHOD

We approached this study from two angles:

- Firstly, a quantitative assessment was undertaken to highlight the economic impact of SFTOP on NSC and New Zealand using Input – Output tables based on industry data tables from Statistics New Zealand. These tables provided the basis for valuing flow-on effects through the local economy of a change in one sector. Multipliers, which measure the magnitude of a role that a particular sector plays in the overall economy, enabled us to compare and contrast the economic impact of every sector associated with the proposed project on the overall economy.
- For this report we interviewed 15 key stakeholders as part of our social and economic impact analysis to gain an understanding of the perceived issues regarding the impact that SFTOP might have on the North Shore. This information supplements and informs the first objective of this investigation.

The following section examines the economic impact of a fully developed SFTOP on NSC and the New Zealand economy. Four key areas of economic impact will be highlighted namely, output, employment, additional expenditure and fiscal impacts.

5. QUANTITATIVE RESEARCH FINDINGS

5.1. Objective

This part of the investigation examines and measures the potential economic impact the completed SFTOP might have on NSC and the New Zealand economy.

The fully completed SFTOP will impact on the North Shore and New Zealand economy in several ways. First, technology-based companies generally use local resources to provide a product or service that caters predominantly to an export market. Such industries are considered to be the main driver of economic growth due to a multiplier effect associated with the industry sector. In other words, every output of, and every job in, SFTOP will impact on other industries within the regional economy.

Furthermore, direct and indirect expenditure made by employees of tenant companies and management can be assessed. A significant portion of the annual salary and wages paid to the expected 7,000 employees of a completed SFTOP can be assumed to be spent in the region. Most of the services and expenses related to the management of SFTOP are expected to be provided locally as well. In addition, substantial expenditure on construction projects will impact significantly on the local building industry. The completed park will host a total of 13 buildings including multi-tenant buildings, hotel, conference facilities, restaurants, gymnasium, and service shops. The total value of the park buildings is estimated at \$NZD 300 million.

Finally, a fully developed SFTOP will create a net fiscal gain to NSC in the form of rate payments.

5.1.1. Approach

Economic impact encompasses four key areas: output, employment, additional expenditure and fiscal. In order to evaluate the impact on output and employment, a multiplier analysis is used. The details of the multiplier analysis are discussed in the following section. To evaluate the expenditure effects, we first estimate the average income generated by SFTOP. We then calculate the expenditure effect by finding the proportion of income that is expected to be spent in the North Shore region. For this, we will utilise the index of the average marginal propensity to consume in New Zealand. Fiscal Impact is the estimate of the North Shore City Council rates that the completed park will be subject to.

5.2. Economic Impact Analysis

5.2.1. Method

In order to evaluate the economic impact of the completed SFTOP on the regional economy, we used national Input-Output tables, based on Statistics New Zealand's

1994-1995 inter-industry study, the latest available. These tables are also used to calculate the output, expenditure and employment multipliers which will help us to quantify the indirect effects, as well as the direct effects associated with the establishment of SFTOP. Unfortunately, no specific regionalised Input-Output tables are computed by Statistics New Zealand. This means that it will be difficult at times to determine the factual impact on the NSC economy. However, the analysis will highlight the impact of SFTOP on the New Zealand economy.

An Input-Output Table shows the sales and purchases between sectors, including those between industries, households and overseas. The Input-Output tables used in this study are provided by Statistics New Zealand and cover 126 separate industries. In a first step, we determined the industry headings that best describe the companies that are likely to be situated at the technology park. We calculate separate expenditure and employment multipliers for the following sectors:

- Non-residential Building/Construction
- Communication Services
- Technical Services
- Computer Services
- Management Services

The inter-industry nature of the input-output tables provides the basis for valuing the flow-on effects through the local economy of a change in one sector. That is, by manipulating the Input-Output table, we can derive the impact of SFTOP on the regional and national economy. Note that the sector 'Non-residential Building/Construction' has been included as only 2 of the 13 buildings have been completed.

5.2.2. What is a Multiplier?

A multiplier measures the magnitude of a role that a particular sector plays in the overall economy. Therefore, it enables us to compare and contrast the economic impact of each and every sector associated with the proposed project on the overall economy. In this study, we calculated multipliers which measure the direct and indirect effects of a change in a particular sector. The direct effect on the economy is the predicted level of expenditure by SFTOP. The indirect effects are the flow-on effects on industry sectors linked to the park such as suppliers or service providers. For a derivation of the multipliers see Appendix 1. We have used the output multipliers estimated for the Springfield Technology Park (Massachusetts, USA) as a proxy. Although it is smaller, the Springfield Technology Park closely resembles the developing SFTOP because it is located in a culturally similar environment, the buildings are of a comparable quality, they aim to host the same technology-based tenants and the study was conducted by a reputable University, the University of Massachusetts.

5.3. Assumptions

5.3.1. Assumptions used in estimating the output impacts

While estimating the output impacts of SFTOP, we used the Input-Output tables for the New Zealand economy as a whole as no regional tables exist. We estimate that on completion SFTOP will generate a total annual output of \$NZD 700 million. This figure is derived from company output of New Zealand firms in the technology sector to a total of 7,000 employees. The figure does not take into account output generated by the same company elsewhere in New Zealand or offshore.

5.3.2. Assumptions used in estimating the employment impacts

As we mentioned above, it is assumed that the total employment in the technology park will be around 7,000 employees on completion. This figure was derived from an accepted staff density ratio of 1 employee per 14 square metres office space. This is consistent with the density ratio of the Telstra Clear building. We also use the output multipliers estimated for Springfield Technology Park (Massachusetts, USA) as a proxy.

5.3.3. Assumptions used in estimating the expenditure impact

In order to calculate the expenditure impacts, we utilise the average marginal propensity to consume of the New Zealand economy. Marginal propensity to consume indicates the percentage of an additional dollar earned that is spent on goods or services. Currently this figure is 76 percent.

In order to estimate the total income generated by the park, the number of employees is multiplied by the per capita real GDP of the New Zealand economy, which is \$37,000.

5.3.4. Assumptions used in estimating the fiscal impact

City council rates are determined by land value, staff density and number of sanitary facilities. We assumed that future buildings in the park will be similar to the Telstra Clear and Tranz Rail buildings in terms of the factors discussed under 5.3.2. Therefore, the current city council rates paid by the Telstra Clear and Tranz Rail are used to approximate the anticipated rates for the completed park. After further discussion with the North Shore City Council Rates Officers, we concluded that the park will pay around \$NZD 6.50 per square metre of ground floor area.

5.4. Results

5.4.1 Output Impact

As we do not know how much each industry will contribute to SFTOP, it was not possible to compute an overall output multiplier. According to our calculations, different sectors have different output multipliers. The largest output multiplier is found for the communication services sector. If we assume that all of the sectors will contribute equally to the park, then a \$NZD 1 increase in output by the park will induce a further \$NZD 0.11 increase in output for the regional economy. Therefore, with the assumption of a \$NZD 700 million future output, the completed park will generate approximately \$NZD 75.6 million of additional income each year for the New Zealand economy. However, if we assume that half of the park will be communication sector oriented, the additional income generated by the fully developed park will increase to \$NZD 270 million annually. It should be noted that the building sector will only contribute to the output during the construction stage of the Technology Park.

The output multipliers for all the sectors included in our study are presented in the following table:

Table 1: Output Multipliers for SFTOP:

Industry	Output Multiplier
Communication Services	0.77633
Non-residential Building	0.466925
Computer Services	0.159054
Management Services	0.075105
Technical Services	0.057388

5.4.2 Annual Employment Impacts of a Fully Completed Park

The employment multipliers for all sectors included in our analysis are presented in Table 2. If we assume that the jobs in the park will be equally allocated between the sectors, the 7,000 jobs created when the park is completed will generate an additional 15,645 jobs in the regional economy. Once again, these estimations show that SFTOP will create more additional jobs if it is communication services-oriented. If half of the jobs are allocated to the communications sector, SFTOP will create an additional 15,970 jobs. A total of at least 22,645 jobs may thus be attributed either directly or indirectly to SFTOP. Note that this figure implies that tenant companies are start-up ventures, re-locate from off-shore locations to SFTOP or will not leave for an off-shore location due to the existence of the park. The number may be significantly reduced if companies simply re-locate from within New Zealand.

Table 2: Employment Multipliers for SFTOP

Industry	Employment Multiplier
Communication Services	3.104
Computer Services	1.690
Management Services	2.163
Technical Services	1.983

5.4.3. Expenditure Impacts of a Completed Park

The anticipated total wage income generated by the completed park is \$NZD 259 million per year. If we assume that 76 percent of this wage income will be spent on goods and services, SFTOP will contribute approximately \$NZD 197 million annually to the North Shore region. Furthermore, if we take into account the 15,000 additional jobs created by SFTOP, the total contribution may be as large as \$NZD 600 million. Note that it is not possible to determine exactly how much of income is spent in NSC or in the wider Auckland region.

Currently, two of the proposed 13 buildings have been completed. The total value of all buildings in the park is estimated to be around \$NZD 300 million. In the construction process of the Telstra Clear and Tranz Rail building, local builders and suppliers have been used whenever possible. The completion of the park will therefore have a positive impact on the building sector on the North Shore and New Zealand. The factual impact will depend on the level of locally/nationally sourced components. Note that the spill-over effects of the construction phase have been included in the multiplier analysis.

Assuming that future companies in the park have a similar cost structure to Telstra Clear and Tranz Rail, the total annual operating expenses of the completed park are estimated to be around \$NZD 5 million. Currently 60 – 70 percent of the operating expenses are spent locally on the North Shore. This suggests that the completed park may lead to further annual expenditure of \$NZD 3–3.5 million on the North Shore.

5.4.4 Annual Fiscal Impacts of a Completed Park

The ground floor area of the completed park is expected to be 100,000 square metres. With an anticipated average North Shore City Council rate of \$NZD 6.50 per square metre, the total amount of rates paid to NSC will be approximately \$NZD 650,000.

5.5. Conclusion

This section demonstrates the significant impact of a fully developed SFTOP on the North Shore region and the New Zealand economy. The completed park is expected to produce \$NZD 700 million in direct output (like goods and services produced by companies located in SFTOP) per annum. An additional \$NZD 75.6 million may be generated due to the multiplier effect. This means that SFTOP may contribute as much as \$NZD 775 million annually to the regional economy.

Furthermore, on completion, tenant companies in SFTOP could create a total of approximately 7,000 direct jobs. An additional 15,645 jobs may be created due to the multiplier effect. In total SFTOP may influence as many as 22,645 jobs in the regional economy.

The expenditure impact of SFTOP will be significant. The anticipated total wage income generated by SFTOP will be \$NZD 259 million per year. Annually, employees of the park are expected to spend \$NZD 197 million of their income in the regional economy. Taking the impact on jobs outside the park into account, this figure may rise to \$NZD 600 million. Furthermore, construction of the park will generate an estimated \$NZD 300 million for the building sector. Operating expenses of SFTOP are expected to be \$NZD 5 million per year. Of these operating expenses, approximately \$NZD 3-3.5 million are likely to be spent in the North Shore economy. Fiscally, SFTOP is a significant income generator for NSC. On completion, the park is expected to pay rates to the North Shore City Council of around \$NZD 650,000 per year.

6. QUALITATIVE RESEARCH FINDINGS

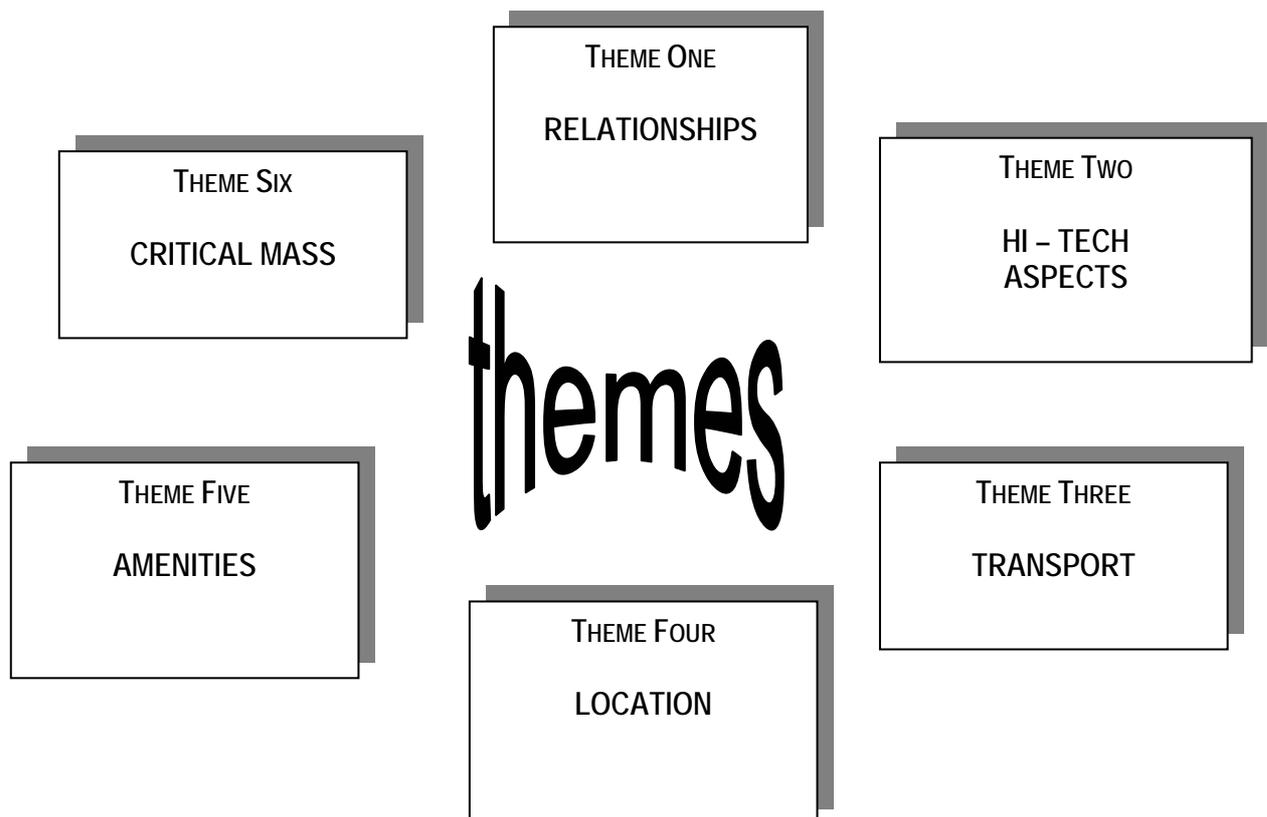
6.1 Introduction

In order to gain an in-depth understanding of how SFTOP is regarded in terms of what social and economic impacts it might have on the region, we interviewed 15 stakeholders including educational, governmental and commercial professionals, as well as current SFTOP tenants. On average, each interview lasted for one hour, with twelve of the fifteen interviews being audio-taped and later transcribed. Excerpts from the transcribed interviews are included in this section. The interviews were conducted in an open-ended manner, and the participants were asked to discuss the impacts they thought might have developed or would develop in NSC as a result of SFTOP. The participants were asked their views on whether such impacts would have positive or negative outcomes including:

- desirability of the North Shore as a place to live and/or work
- educational prospects
- work/training/career possibilities
- traffic issues
- community engagement
- business opportunities including start-ups and clustering
- aesthetic appeal
- environmental concerns

6.2 Themes

Six interconnected themes emerged from the analysis of our interviews:



We have used excerpts from the 12 taped interviews with our respondents to illustrate our various findings. The findings from the interviews have been grouped under the six themes listed above. In some instances, findings overlap with one or more theme, in which case we have placed each finding with the most relevant theme.⁷

During the analysis of the interview results, the findings from each theme (with the exception of the sixth theme) were classified into the three subsets of ‘opportunity’, ‘hurdle’ and ‘benefit’, depending on whether the specific finding was considered as being significant to the success of SFTOP, or as a possible limitation or advantage. Due to the nature of the sixth and final theme (critical mass), the findings were all classified into just the first subset of ‘opportunity’.

6.3 Theme 1 – Relationships

This theme relates to the associations that the Smale family have with various other groups and organisations. It was readily apparent that the Smale family are held in high regard within the North Shore area, and that a considerable amount of this esteem reflects the view that the objectives and aspirations of the family are intended to benefit the community at large, and are of a long rather than short-term nature. Particular mention was also made of the crucial relationships between SFTOP and North Shore City Council, Massey University, schools and the North Shore community. The quotes below outline the various ways in which relationships were regarded as key to the social and economic impacts of SFTOP:

6.3.1 Opportunities

...so long as there is an association, and so long as within that complex...you set up a collegial culture...which is what they are seeking to do, by providing gyms and cafes etcetera [then] you will actually create the environment. The big difference between what...we are doing in New Zealand and what's being done overseas is effectively the role of the local body and national government...over there...there is money available... (Int. 3)

...linkages...New Zealanders are wonderful for that – there is no such thing as six degrees of separation in New Zealand – I think it is about three and a half – and it's important to capitalise on that sort of thing...it's about public profile - what it is that they [Smales Farm] are actually doing – where it fits ...selling itself in a real way...how many of the Principals of each of the high schools have actually been there?...how are they going to sell the opportunities...what are the opportunities?.....I think there are some

⁷ In some cases, it has been necessary to reduce the length of an excerpt. In such instances, three full stops (...) have been inserted into the text to signify that words within a sentence have been excluded. In instances where one or more sentences have been excluded, six full stops (... ..) have been inserted. Words within square brackets [like this] have been inserted to provide clarification and are not the actual words of the respondents. The utmost care has been taken to ensure that in using these devices, the context and the intent of what the respondent stated has not been distorted or altered.

synergies on the North Shore – I think part of it could be to do with ...how would the e-centre [fit in]...what linkages...does it have with the ASB Bank Technology Centre sitting up on Albany hill here? What are the linkages there? Where are the synergies across that? (Int. 4)

6.3.2 Hurdles

...there certainly seems to be a pretty good opportunity – I know a lot of these office park like aligning themselves with universities and certainly in that respect you would expect it to work and I pray that it does – but I actually haven't seen any immediate benefit to accrue ... (Int. 5)

6.3.3 Benefits

...you would have to give a lot of credit to the Smales family ...because they are taking a fairly long-term approach – probably longer than anyone I can personally think of...it's not something that they are building just for this generation...they are building for their Smale family over many, many years, many many generations...it's very much market driven but ...they're not necessarily someone who tends to make short-term decisions – they tend to make very long term decisions and make sure they do the right ones that are sustainable – so a lot is to be admired about the way they go about their business... (Int. 2)

...the thing that singles the Smales farm out from every other development on the Shore is that it happens to be associated with a family who are clearly there for the long haul... (Int. 3)

...the Smales are very dedicated to building a community and the community environment...the likes of the laser light show...[the] British car day – they have the hazardous goods recycling every couple of months – so they are very open minded about doing community things – but at the same time they are very responsible in their beliefs as a landlord and what they need to provide.....it's the hands-on approach that the Smales have as landlords...they are extremely approachable and they are really pleasant to do business with personally...it's a really lovely relationship...the sort of thing you don't come across in business every day...they are a lovely family... (Int. 10)

Another interview participant mentioned that SFTOP is not an end in itself, and operates closely with universities and technology-oriented companies in which key people understand the vision of SFTOP. In this regard, it was noted that the human dimensions and capabilities are not only a key building block, but that such infrastructures and strategies take time to develop and expand. A further interview participant stressed the importance and need for SFTOP to forge stronger relationships between North Shore City Council, local schools, Massey University and central government as a way of connecting up to the rest of the innovation

system. In commending the Smale family for their long-term approach, it was suggested that SFTOP's vision could be further formalised and that a project champion or park director could complement the family's own skills in promoting SFTOP.

6.4 Theme 2 – Hi-Tech Aspects

The theme of 'Hi-tech Aspects' includes the interview findings that relate primarily to the Technology Office Park (TOP) aspects of Smales Farm. A substantial quantity of the interview findings focused on the significance of the park as an information and communication technology centre (ICT), and the extensive and multiple spin-offs that such centres are capable of offering. The potential that TOPs present in terms of regional development, including their role as an economic development vehicle, incubating start-up businesses, clustering, employment and education opportunities, were discussed at length. The high cost factors involved in TOPs were also mentioned, as well as the crucial role of NSCC in terms of supporting high technology companies in the region.

6.4.1 Opportunities

...Smales offers back to the community in attracting businesses like EDS - becoming a focus for hi-tech industries that might demarcate North Shore city – differentiate North Shore City – give North Shore City an international connection – all of this...swirls around in the social-political thing.....we should be recognising the signature businesses and Smales Farm is one of those.....North Shore City needs to encourage businesses that have new horizon prospects – industries that are on the rise.....if we are going to do our kids a favour we would be identifying what we think these sunrise industries are.....I think a lot of organisations are here because they know this is actually a good environment in which to do business...because the ingredients for doing business are here... (Int. 14)

6.4.2 Hurdles

...the whole thing is hobbled because of the regulatory environment we're in – it's hobbled because regionally we haven't got a strategy implemented – we're hobbled because...people on the Shore do not link their wealth, their well-being to economic activity, business activity – they just don't understand that their grandchildren, their pensions, are all invested somewhere...they should have it here, they could have it here – invest in businesses on the Shore...that's a major impediment to Smales... (Int. 2)

...the rent at Smales that are coming through are a major prohibiter..... cost is an issue – and the perception is, is that Smales is expensive – right or wrong – it is the perception...(Int. 6)

...the North Shore is a very privileged community in a lot of ways – it has high household incomes by New Zealand standards – it’s generally safe – it has got pretty good access to telecommunications technology...it’s also complacent.....what you have got here are people that have come because it’s a nice place and they have kind of made it and can come here and for a lot of people that’s the end of the line...they don’t want anything different – they don’t want it to change – they don’t want anything better...in a curious kind of way I think that’s a huge handbrake on the North Shore [and] it’s manifested in all sorts of ways... (Int. 14)

6.4.3 Benefits

...it’s a very very important part of the city’s economic development and social side too because it provides employment...Smales are doing a very good job of attracting large businesses to the North Shore...[they’re] creating employment – creating a centre of knowledge based economy.....Smales Farm are forward looking – they are not going to set up cheap accommodation...the quality of their buildings is very high and that is a major social benefit...they are very high tech, very well designed, aesthetically pleasing and will serve the community for years ahead... (Int. 2)

...it’s a fabulous place – Clear, when they came over, used to have a [staff] turnover of about twenty percent per annum...no loyalty at all – [that] stopped straight away. TranzRail – they predicted doom and gloom [but] the people love it... (Int. 5)

...you talk to taxi drivers, the retail industry and so on...that recognise this place and see it as an opportunity.....it’s a little bit of an icon I suppose – it’s something positive that they see and I guess the flow on effects for the local economy here as well – I see it as being quite a positive image for the Shore... (Int. 12)

It is evident from the quotes above that the hi-tech and ICT aspects of SFTOP are regarded as crucial economic development tools in terms of creating a nurturing environment for ICT development and providing a supportive milieu in which to encourage education, employment, clustering, incubator and start-up businesses and the manifold spin-offs that result from such development. The regulatory environment, perception of the park as high cost space, and the complacent attitude of North Shore residents were all regarded, to some degree, as impediments in furthering the promotion of ICT at SFTOP in particular and NSC in general. However the high quality of the park, the way in which staff turnover is regarded as having dropped, and the way in which SFTOP is viewed as both an opportunity and an icon, demonstrate the ways in which the park is considered as something of a windfall to NSC.

6.5 Theme 3 – Transport

Discussion relating to transport included the issues of traffic congestion, car parking, public transport and the need for a local airport. Of note was the difference of opinion related to those who regarded the SFTOP locale as experiencing considerable traffic problems, and those who regarded SFTOP as benefiting from little traffic congestion, especially in comparison to elsewhere in the Auckland region. An interview with the NSCC traffic division highlighted the complex nature of traffic issues in general, and within the Northcote/Taharoto Road area in particular. The Northcote/Taharoto Road junction that borders SFTOP is not only the main feeder road for a number of schools in the vicinity; it also provides the primary access to the nearby North Shore hospital and neighbouring medical specialists, and acts as the main route to Takapuna and Devonport for southbound traffic leaving the motorway.

6.5.1 Opportunities

...[North Shore City] Council has got a huge problem on it's hands with traffic – which it is addressing now...through public transport and the bus-way – I think from that bus-way project, plus the project that's going to emerge for the Auckland region, those transport problems will be solved.....in two or three years time when Council's plan are put in place there will be a marked improvement.....socially I don't think the population of North Shore really yet appreciate the value that Smales are providing them and I think Smales have an up-hill battle to show that value and I think it is incumbent on all of us to show the benefits – however the benefits are a little bit indirect because people just see traffic congestion... (Int. 2)

...having that bus depot at Smales will be interesting...my sense is that...the executive is not going to get on the bus – the executive will drive to Smales and park...partly negative, partly positive I suppose... (Int. 6)

6.5.2 Hurdles

...the access to and from the motorway is really a huge challenge because it's an A-grade bottleneck...[and] people who are coming in as tenants are going to...contribute to that bottleneck and of course there's parking issues associated with that as well – so the optimal development size...may have some kind of traffic constraint ... (Int. 3)

...the only thing is just getting in and out of here through the traffic lights here – that would be the only thing.....[another] issue is access to the airport and the extra time you need to allow to get there – obviously the expense side of it – the extra distance required and the time as well – you don't necessarily have the time but have to allow for it ...that's a bit of an issue...having an

international airport or a strong domestic airport on this side would be pretty useful ... (Int. 12)

6.5.3 Benefits

...I personally don't find it an issue because I'm not travelling in school times but the traffic is getting busier anyway...if we were in town it would be worse.....yes...these are quite busy roads but it is ...worse in most places in Auckland... (Int. 7)

...we have visitor parks right in front of our building – how often do you go to the city and you've got to delve into the bowels of some building and drive around and around and around to try and find the right park.....my meetings in the city – people say come in and we'll have a meeting – I say 'no, you come to me – you can park on my front doorstep – you're two seconds off the motorway – for you to get to me is a lot faster than for me to get to you...' (Int. 10)

...car parking...the fact that you can actually come and go as you please during the day – whereas perhaps inner city parking – you have to go out [and] you've got to pay to get back in again, and obviously much more expensive... (Int. 12)

From the interviews held with employees of the tenants based at SFTOP, it was apparent that some of the park's tenants provide free parking to their staff, while other tenants charge their staff for parking on SFTOP site (approximately \$1000 - \$1200 per annum). Concern regarding the security of cars parked at the site was also mentioned, as well as the phasing of the traffic lights from the park onto Taharoto Road. Upon visiting SFTOP site, it was evident that a security firm was monitoring the car parks. Discussions with the traffic department of North Shore City Council also revealed that the phasing of the traffic lights on Taharoto Road had recently been investigated and improved. The planned bus-way was also considered as providing a significant reduction in traffic congestion, as well as upgrading the Esmonde interchange, including the construction of north facing ramps meaning that that trips to and from the north can occur along Esmonde Road. Though transport constraints, including car parking, security, and traffic congestion, were mentioned by some employees of tenants based at SFTOP, it should be noted that constraints about transport were raised more often by interview participants *not* based at the park. In this respect, it could be argued that the traffic constraints relating to the park are as much about perception as they are about the actual experiences of commuters based at SFTOP.

6.6 Theme 4 – Location

Though the previous theme of 'transport' cited various restraining factors that relate in some instance to the location of SFTOP, the interview participants, in general, were of the view that benefits of the location of SFTOP outweighed the constraints

regarding its location. The primary matters related to the dilemma of the park's location, to the point that the park was not within easy walking distance of retail shops and other amenities, and that it was located on the North Shore, rather than in the CBD. While it is evident that all six themes include a number of issues that relate to factors external to the park, it is apparent from the quotes listed under the previous theme of 'transport' and the quotes provided below under the current theme of 'location', that both these themes raise a number of issues that could be considered as being beyond the control of SFTOP.

6.6.1 Opportunities

...my sense is that when I look at how these things are developing [there's] a potential market for them in that smaller businesses...that sort of individual who actually has and needs to go to Auckland – but doesn't want to go there at 8.30am in the morning because it's too hard - but he can drop his kids off at the local schools and stop in at Smales – work – and then have a meeting at 10am, 11am, and lunch, and he's back – it's ten minutes there and back and that's fine.....there is no equivalent type of operation in the city – maybe this thing around the Viaduct may develop and that's quite an attractive option – so that's probably quite competitive I would think – that Viaduct scenario – where the prices could in some cases, from what I've seen, are a little bit cheaper... (Int. 6)

6.6.2 Hurdles

...for Smales the disadvantage, very much, is the fact it is on the Shore – try as we might, we cannot break down an inherent...mental block about the Harbour Bridge and the North Shore – it is just a silly, silly thing – but people sincerely believe that the North Shore is cut off – that you come to the North Shore [and] you're isolated from the mainstream...I work very hard on trying to retain a presence in [the] office on the other side – so people don't forget me...that's the biggest stumbling block to Smales Farm... (Int. 5)

...you could probably go and play golf...but you can't walk to the beach – you still have to drive there – you can walk and have a swim in the lake if you're that keen [but] you can't really walk to Takapuna... (Int. 6)

6.6.3 Benefits

...the proximity to the motorway is a big tick.....Smales is ideal – you're straight onto the motorway – you're into the city and you're back out.....it's a high profile [for] those who have a need for that sort of visibility [and] for those who have a desire for a fairly big local market and for those that have a need for closer interaction with the city...(Int. 6)

...access for our customers is a benefit [and being] close to the motorway in terms of explaining to people where we are.....most people either know it by name or if you say 'take the Northcote exit and you'll see a jolly great sign' – it's very simple – so it's good for our customers – good that they can always get parking – good that they can come and visit us whenever they like.....we looked at various places – we looked in Penrose, Ellerslie, [the] Viaduct or way up College Hill, Ponsonby, and then we looked further a field out as far as Albany – we initially felt that this would be an expensive move to here and when you actually sit down and work out the numbers – yes the rate per square metre is dear – but your proximity to everybody – your central location – the ease of getting straight back to the Bridge for other people – there's just no contest – quite frankly it's a fabulous place to work (Int. 7)

...location...that was one of the aspects [we] looked at when we relocated – we wanted to have fast access...for the staff...but also for our clients coming to visit – the location of the park is such – you come straight up the motorway – off at Northcote – and you're on the front door – you're not fighting the gridlock of the city – you're not hunting around a whole lot of back streets – so the accessibility was fantastic – the other thing was visibility...we've now got free advertising...how many hundreds of thousands of cars go up and down the motorway each day...there was a double whammy there that worked to our advantage – the other was from a commercial aspect...what Smales were marketing here...as A-grade buildings – when we looked around at the...sites we had short-listed – some of the stuff that had been marketed off in the city as A-grade – and what you paying for – by comparison to our building here – it was no where near an A-grade building – but they wanted more rent because it was in the CBD – the CBD has more drawbacks I think – than positives for a commercial location... (Int. 10)

...if you look at the spine that runs up North Shore City – if you had Smales Farm – if you had technology park number two in Wairau Valley...Massey has its own long term plans for a technology park – there's number three – suddenly you have got this series of stepping stones that may take you into Rodney but Smales may be the first of these...in that sense it's important – not just signalling what Smales is itself – but what trends might follow – what imitation there might be ... (Int. 14)

As mentioned above, a certain number of the issues listed in both this theme, and the previous theme, remain outside the control of SFTOP. The following theme of 'Amenities' demonstrates that, despite the fact that amenities external to park may be beyond the influence of the Smale Family, the amenities provided within the park play an important role in offsetting external restraints.

6.7 Theme 5 – Amenities

Factors relating to 'amenities' include the convenience and availability of nearby retail shops and services including banks, post offices, supermarkets, cafes, gyms,

dentists and doctors. Amenities also describes such aspects as the sense of design, aesthetics and security. The following excerpts illustrate that there are some reservations concerning the availability of shops and services, in comparison to the high degree of satisfaction with the internal design and aesthetic features of SFTOP.

6.7.1 Opportunities

...amenities – there's a proposed supermarket just around the corner – just down in Wairau Road - which is only three minutes drive away – which would be a beaut – and it's not beyond the realms of possibility...that would be a real godsend – just as there is if the next building at Smales actually has retail and a gym and so on - cafes.....if we could get the shops in we would have a lot more luck – I think it would be an infinitely better office park for having the infrastructure ... (Int. 5)

...there will be continual growth of core knowledge based businesses right on the North Shore and everyone is going to be competing for those – right up to Silverdale – right up to Rodney basically – right on either side of the motorway...[so] who is going to have the most attractive proposition is where I'm going to stop – am I going to stop at Smales? – will I stop at Silverdale? – will I stop at Albany? My sense is that it is going to centre around those three areas – [that's] where the growth is going to happen... (Int. 6)

...it's going to be marvellous [the new amenities building] for people who have kids here – and the kids will be close if they want to use the crèche - they gym if they want to get stuck into that...it will fantastic...a good addition to the park... (Int. 7)

6.7.2 Hurdles

...probably one of the only things that we need to keep our eye on in terms of park management is security...a system so that people can come to work, park their cars and feel their cars are secure...we recently had a car broken into out the back here and it appears that somebody came down off the motorway off-ramp and broke into the back of it...when you've got 100, 200, 500 cars parked here, of course you're going to attract that element ... (Int. 10)

...the downside I'd say is it's not like at lunchtime – where if you are in the middle of town you can hop out to the shops – you have got to get in the car – and depending on where your car park is...that's a real bugbear... (Int. 11)

6.7.3 Benefits

...this as a place to work is a lot nicer than the office park around Rosedale and the like – it's actually really nice looking out the window and seeing greenery and fountains ... (Int. 7)

...the roading plans are in place – the landscape has been beautifully managed.....the grounds are absolutely pristine – you can go and sit over on the edge of the fountain in the lunch hour and read a book – it's lovely... (Int. 10)

...the building is a lovely building to work in – it makes it all the better...we do get a lot of people that say 'I live on the Shore – can I come and work here?'it's always well maintained...the gardens outside are always looking lovely...when you come to work you have got a nice feeling about it...everything outside is just so well maintained... (Int. 11)

...there are some real connections immediately available and of course there is a golf course on the other side of the motorway – so I think the location good – it's quite a commanding site as well – it's visible – architecturally it's good...it makes you sit up.....the drawings and plans I have seen have been done carefully and they have taken note of several things that I think they deserve credit for – one is not building on it as intensively as they can do under the act...I think they've said they'll build on no more than 75% of the space...basically they're saying that we want the place to look good – we want there to be green spaces...there appears to be a concern for aesthetics – the environment – not just the natural environment – the built environment as well – and I think that's also an important part of how Smales signals to North Shore City and everyone beyond... (Int. 14)

It was also mentioned by an interview participant that it is important to view TOPs as *part* of an innovation system, and as *one* element of smart infrastructure. This argument can also be extended to the availability and quality of amenities, in that the provision of such amenities can be considered a vital element to the success of not only SFTOP, but as also advantageous to NSC as a whole.

6.8. Theme 6 – Critical Mass

The final theme to be addressed, and also the briefest, is the issue of 'critical mass' (size) which is arguably the crucial factor upon which the long-term success of SFTOP depends. Defined by one interview participant as 'the place to be', critical mass relates to issues such as additionality, clustering, momentum, synergies and economies of scale. It is evident from the excerpts below that a number of the interview participants regard these factors as fundamental to the future of the park.

6.8.1 Opportunities

...we're looking for them to set up facilities for people that have gone past the incubation state...[to] migrate here – they can have flexible lease terms – so that they can grow and contract – provide a collegiate atmosphere.....the third building – that's where this is going to happen.....the next couple of buildings in particular will be really interesting for...cementing more of that community feel on the Smales Farm site... (Int. 2)

...I think it will really start to bite and really start to make a splash when they are up to about building six...there will be sufficient facilities around ...that it really starts to take off.....there are a few challenges that the family face – but their big plus...is that they're prepared to wait – they're prepared to take as long as it takes to do it and eventually therefore, with that attitude...they will win – they will get what they want and if they got up to building five or six then they are in a position to generate...momentum... (Int. 3)

...there is a lot more potential in the future if they are going to build another complex and introduce some different shops and so on... (Int. 12)

...I would say the Smales Farm thing is two buildings shy of perhaps where it needs to be to say 'we are now committed absolutely to this vision and here is the way in which we can plug in'...I imagine they sit down and occasionally talk about at what point does this have a momentum that's unstoppable.....it's possibly a little underdone at the moment.....[with] EDS and Telstra and other big companies is an opportunity to take start-ups or post incubator companies, spin-off companies, kind of under the wing of those bigger companies and have them operate alongside...it's common enough elsewhere – smaller companies gravitate towards those bigger companies and so somewhere in the mix of Smales Farm there could well be a building or buildings dedicated to SMEs, new start-ups, post incubator companies that get a level of support by being clustered together – get access to channels...it's a kind of mutual deal... (Int. 14)

6.8.2 Conclusion

In concluding this section, we note that the 'mutual deal' mentioned in the final excerpt is not confined to SFTOP. As outlined in both the quantitative and qualitative sections of this report, the achievements of the park once completed will extend beyond the boundaries of the park itself and yield both social and economic returns to the North Shore region.

7. SUMMARY

A common theme in the literature on technology parks indicates that the development of a region is enhanced and, at times, dependent on a sustained concentration of innovative and technologically orientated businesses. The findings in this study suggest that a technology office park such as the one being developed on Smales Farm is perfectly located on the North Shore and, in turn, represents an important opportunity for the North Shore economy. As the fourth largest city in New Zealand with the fastest growing economy in the Auckland region and a well-trained and educated population, NSC is an attractive option for high technology companies looking to locate their businesses. Furthermore, the proposed and already achieved outcomes of SFTOP present various benefits in the form of sustainable development. As the literature indicates, quality urban design and a long-term approach, like the one the Smale family are demonstrating in developing the land, enhances the growth and value of a region.

Once completed, SFOTP will have a significant impact on the North Shore region and New Zealand as the park is expected to produce \$NZD 700 million annually in direct output with an additional \$NZD 75.6 million generated due to multiplier effects. Moreover, tenant companies could directly create about 7,000 jobs that could lead to an additional 15,645 jobs being generated in the regional economy, again due to the multiplier effect. This would produce a total wage income of \$NZD 259 million per year. Other spin-offs include employment created by the construction of the additional buildings, operating expenses to be spent in the North Shore economy as well as rates paid to the North Shore City Council.

The 15 interviews with local government, educational and commercial professionals elicited six interconnected themes, namely relationships, hi-technology aspects, transport, location, amenities and critical mass. Overwhelmingly, the interviews highlighted the numerous associations the Smale family has with various groups and organisations and it was very apparent that the family is held in high regard within the North Shore area. A considerable amount of this regard relates to the view that SFTOP benefits the community at large and the objectives and aspirations of the family are long-term rather than short-term in nature.

The park was seen as a significant high technology centre with extensive and diverse spin-offs. The role of a park of this nature was seen to contribute in an important way to the economic development of the region. The crucial role of the North Shore City Council in enhancing economic development was highlighted. As both the quantitative and qualitative sections of the report have revealed, the achievements and influences of a technology office park extend beyond the boundaries of the park itself and generate major economic and social returns to the North Shore region and New Zealand as a whole. As one of the participants in this study so aptly observed, Smales Farm is a signature project. It is a way of saying that 'this is a prime site, it's a new site, it's modern and forward looking in its orientation'. SFTOP represents important development opportunities which will help characterise North Shore City and the North Shore City economy in particular.

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APPENDIX 1

Derivation of the Multipliers

Given an n -sector economy, the transactions matrix and the vectors of final demands and outputs can be represented as:

$$Z = \begin{bmatrix} z_{11} & z_{12} & \dots & \dots & z_{1n} \\ z_{21} & \dots & \dots & \dots & z_{2n} \\ \dots & \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots & \dots \\ z_{n1} & \dots & \dots & \dots & z_{nn} \end{bmatrix} \quad f = \begin{pmatrix} f_1 \\ f_2 \\ \dots \\ f_n \end{pmatrix} \quad x = \begin{pmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{pmatrix}$$

where:

z_{ij} = sector i sales to sector j

f_j = sector j sales to final demand

x_j = total sector j sales

The relationship between the elements of these matrices is:

$$x_i = z_{i1} + z_{i2} + \dots + z_{in} + f_i$$

The technical coefficients (or direct input coefficients) of sector j are written:

$$a_{ij} = \frac{z_{ij}}{x_j}$$

which in matrix form is:

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{bmatrix}$$

Thus a_{ij} is the proportion of sector j 's total output (the value of which is equivalent to

the value of sector j 's total input) and is made up of inputs from other sectors (i).

Given equation (1), sector i 's sales can be rewritten and expressed in terms of technical coefficients as:

$$x_i = a_{i1}x_1 + a_{i2}x_2 + \dots + a_{in}x_n + f_i$$

Equations (1) and (3) respectively can be written in matrix form as:

$$x = Zi + f$$

$$x = Ax + f$$

where i is an n -element column vector of 1 s.

Recall that equations (1) and (3), and hence (6) and (7), are equivalent.

Using an $n \times n$ identity matrix and rearranging equations (5) yields:

$$Ix - Ax = f$$

$$\Rightarrow (I - A)x = f$$

From this we can derive the change in output, x^* , arising from a change in final demand, r^* :

$$x^* = (I - A)^{-1} f^*$$

$(I - A)^{-1}$ is the Leontief Inverse, or the total (initial, direct and indirect) requirements matrix. This can be represented by B so that:

$$x^* = Bf^*$$

Re-expressing equation (10) in expanded format gives:

$$x^* = \begin{bmatrix} b_{11} & b_{12} & \dots & b_{1n} \\ b_{21} & b_{22} & \dots & b_{2n} \\ \dots & \dots & \dots & \dots \\ b_{n1} & b_{n2} & \dots & b_{nn} \end{bmatrix} \begin{pmatrix} f_1^* \\ \dots \\ f_n^* \end{pmatrix}$$

From this it can be seen that the economy-wide impact of f_j^* is:

$$x^* = \sum_{i=1}^n b_{ij} f_j^*$$

For $f_j^*=1$, x^* reduces to:

$$x^* = \sum_{i=1}^n b_{ij}$$

x^* is the (Type I) *output multiplier*: that is, how much does economy-wide output have to increase to meet a \$1 increase in final demand for the output of sector j .

Employment multipliers are calculated in a similar way, but this time the inverse Leontief matrix is multiplied with the ratio of full-time equivalent jobs to output by sector. Unfortunately, this matrix is not provided by Statistics New Zealand. We therefore use the output multipliers estimated for the Springfield Technology Park (Massachusetts, USA) as a proxy. Although it is smaller, the Springfield Technology Park closely resembles the developing SFTOP because it is located in a culturally similar environment, the buildings are of a comparable quality, they aim to host the same type of technology-based tenants and the study was conducted by a reputable University, the University of Massachusetts.