EXTERNALITIES OF I.T. GROWTH:

How a Healthy I.T. Market can Stimulate Growth in Commercial Real Estate

November 24, 1999

Prepared by: Tony Gill,.
(905) 940-5399
tony@gillinc.com

- Information Technology (I.T.) is Canada's fastest growing industry accounting for $100 billion in annual revenues; the industry has grown at twice the rate of the economy as a whole

- No other industry is so dependant on R&D because of the compressed life cycle of IT products and services

- Canadian firms spend $3 billion annually on R&D but are still limited in the amount of spending they could do if tax rates were more harmonious with the U.S.

- The state of I.T. health has rippling effects throughout the economy including a major impact on commercial real estate

- U.S. "I.T. Supercenters" including Silicon Valley, the Research Triangle, Austin, Seattle and Boston provide excellent case examples of the important attributes I.T. companies consider when making site location decisions

- Clusters of high tech firms generate new innovation, as measured by patents, a greater flow of venture financing, and general business expansion

- Real Estate performance in these centers mirrors the success of these industries

- Canadian I.T. Centers possess most of the factors necessary to compete in the global economy; they are now looking for fiscal measures to put them on a level playing field with everyone else; if this is done, real estate markets should prosper as well

This paper has been prepared to demonstrate that the growth of the IT industry has strongly influenced the direction of commercial real estate. Given the fact that this sector of the economy is a strong economic driver of communities, often signaling the prevailing state of confidence in an area, creating public policy measures that align with this growth is crucial. Creating public policy that benefits the retention and growth of the IT industry in Canada, not only benefits commercial real estate, but strengthens the well-being of Canadians.

The Canadian IT industry has emerged as a powerhouse in the Canadian economy, it is Canada's fastest-growing industry and accounts for $100 billion in annual revenue[1]. For almost four decades, the Canadian IT industry has grown at more than twice the rate of the economy as a whole[2]. Despite this success, our competitive advantages are slowly diminishing, as fiscal policy cannot change with the same speed the IT industry does. The net result is that Canadians are losing many of their best and brightest IT professionals as our border with the U.S. becomes increasingly transparent. Accordingly, Canadian businesses are investing relatively low amounts in plants and equipment due to the uncertainty associated with the future.

Indeed, many advocates of the IT industry state that fiscal policy is placing a "punitive impact on innovation"[3]. The municipalities and provinces that work very hard to create incentive-rich packages for firms to locate in their areas are having their efforts neutralized by a personal income tax system that creates disincentives for people to stay in Canada. Additionally, the corporate tax rates (combining federal with provincial are crippling – combined federal and provincial or territorial rates vary from 38.27% to 46.12%, this compares to a maximum corporate tax rate of 35% in the U.S. [levied on firms whose taxable income exceeds $18,333,333.00][4]). The provisions of NAFTA now make it simple for highly skilled workers to relocate to the United States.

This paper will illustrate what some high tech communities throughout the U.S. are doing to create a working environment that attracts IT firms to those areas from all around the world, and more importantly, attract the best workers in the world. The ultimate result of creating a stable economic environment is strengthening other areas of the economy. One of the major beneficiaries of this growth is commercial real estate. The strengthening of commercial real estate conditions generates wealth, jobs, and of course additional sources of revenue.

KEEPING UP WITH THE RATE OF CHANGE

The IT industry has a compressed business cycle that requires companies to respond to the dynamics of the market with greater speed than any other industry. IT firms in Canada spend $3 billion on research and development annually in order to survive. This factor is extremely significant because there is no other industry that is so dependant on a constant flow of R&D. This is simply because cutting-edge technologies in the information age can be obsolete within a year. These companies who no longer operate within the comfort of a closed market, are now global, and operate in an environment that has incredibly high stakes. There is no other industry that depends so heavily on the power of new knowledge, which in turn fuels growth and competitiveness[5]. Operating in an environment that reduces a company's competitive flexibility can have potentially devastating effects.

---

[1] Andre Gautier, Chair of Information Technology Association of Canada (ITAC), before House of Commons Standing Committee on Finance, Halifax, November 15, 1999

[2] "Achieving Our Potential: The 2000 Federal Budget", ITAC Brief to the House of Commons Standing Committee on Finance, September 24, 1999

[3] Gaylen Duncan, President & CEO, ITAC, Association of Certified Chartered Accountants, May 20, 1999

[4] Site Selection Magazine, November,1999, citing statistics compiled by Ernst & Young's International Location Advisory Service

[5] ibid

CHARACTERISTICS OF SUCCESSFUL HIGH TECH MARKET

"Taxation is testing the allegiances of some of Canada's best and brightest high-tech talent."
John Roth, CEO Nortel

The distinguishing characteristics of North America's premier high tech markets are:

- a highly educated and skilled workforce
- access to capital
- a stimulating environment that is safe and has a very high quality of life
- a critical mass of companies and people that create synergies and foster competitive growth
- a tax structure that creates incentives for companies to remain
- close proximity to and strong alliances with neighboring research universities

Many Canadian centres for IT growth possess most of these attributes in abundance. However, because the stakes are so high, the differential in tax rates can mean the shelving of important R&D projects, or in some instances lead to relocation.

I.T. "SUPERCENTERS": HOW THE CREATION OF STABLE ECONOMIC ENVIRONMENTS STIMULATES REAL ESTATE

"We think of Dell as the anchor tenant in a high-tech mall, and we're sure as heck gonna do whatever we can to make sure they stay happy."
Representative from Austin (Texas) Department of Economic Development

This section initially provides a brief snapshot of five high tech communities in the United States and the major factors that account for their success. Once the groundwork for a stable economy has been formed, we project a strong real estate market to follow. The section concludes with an analysis on how real estate in these high tech centres have performed.

Silicon Valley

Silicon Valley is the undisputed world champion of high tech markets. Firms such as Cisco Systems and Hewlett Packard have been mainstays in the valley for years, but the rapid proliferation of IT has solidified its position as High Tech Haven. Simply put, Silicon Valley is one of the greatest job producing engines in modern history[6]. The success in the area is largely attributable to the fact that the area continually regenerates itself, keeping up with the pace of the industry's change.

The area has greatly diversified from the computer, semiconductor and defense emphasis of the 1980's. Today's top performers include networking, telecommunications, multimedia, software and particularly Internet companies.

In fact, the main focus in the field these days is in developing the Internet. The Valley is producing what Mike Malone refers to as a large pack of "adolescent hot-shots" who are singularly focussed on internet-based applications (these companies would include Yahoo, Java, Netscape and Pointcast). The result of this has been a high demand for qualified workers and a rapidly expanding local economy.

North Carolina's Research Triangle Park (RTP)

North Carolina has a rich tradition of higher education with institutions such as the University of North Carolina, North Carolina State University and Duke University graduating some of the nation's best. In the early 1960's the State government realized that although the state was churning out some of the nation's best graduates, their retention rate of these graduates was very low. The term "brain drain", which has

[6] Mike Malone, "The Triangle vs. The Valley"

become increasingly popular in Canada in the late 1990's was used to describe the exodus of educated North Carolinians in the 1960's. Through an act of the state legislature, a technology zone was created to attract new business to the area. This zone was strategically positioned in the middle of a triangle formed by the three research universities. It has proven itself to be a great success.

Today, the Research Triangle Park (RTP) is comprised of 6,900 acres, housing over 1000 IT organizations under 18,000,000 feet of space. RTP, like Silicon Valley, has created a zone for a well-diversified range of companies, including microelectronics, telecommuncations, biotechnology, chemicals and materials sciences, and healthcare. Unemployment levels in the area are less than 2%[7]. Some of the larger firms that have significant operations in RTP are Nortel Networks, Ericsson, Cisco, DuPont, and IBM.

Austin, Texas

"The role of government is not to create wealth, but to create an environment where people are willing to risk capital."

- George W. Bush, Governor of Texas

Michael Dell enjoyed living in Austin when he was a student at the University of Texas. In fact, if there was a well established job market in Austin, he would stay. There wasn't one, so he set out to create one. Today, Dell Computer Corporation is the region's largest employer adding 100 to 200 jobs per *week*. The growth of IT firms has been nothing short of phenomenal. In 1989 Austin had 177 firms. By the end of 1998, there were more than 600. Another factor that gauges the area's growth is number of publicly-traded companies. Of the 57 publicly held companies in Austin, 32 have staged IPO's since 1994.

In addition to its warm climate, the University of Texas is regarded as one of the region's premier research facilities. At times, the mood around Austin's startups feels like "one big rush party" as companies vie to add employees and more office space[8].

Seattle, Washington

Until recently, Seattle was best known for its production of aircraft. Today, Boeing is still a recognizable name in the Pacific Northwest, but it is Microsoft that has become the new king of the hill. Anchored by two universities (the University of Washington and Washington State University), the region has diversified into areas including software development, semiconductor manufacturing, reproductive biology, computer graphics, and digital media. Since 1969, The University of Washington has been one of the nation's top five recipients of research grants[9].

The major hubs of IT growth firms are Redmond (headquarters for Microsoft), Bothell and Bellvue. Some prominent players that now call Seattle home are GOTONet, Amazon.com, Attachmate (the world's 12th largest software producer), and Sierra Online. Seattle is a textbook example of a market that has attained a critical mass that reduces the state's need to lure new companies by providing aggressive tax inducements such as multiple tax credits, low corporate taxes, and low property taxes. For large firms operating in the area that are profitable, the tax system will be fine. Smaller firms will pay more than they would if they located in say, the research triangle, but the presence of firms like Microsoft make it well worth their while.

Route 128 Corridor (Boston)

For generations, the textile industry clustered around the outskirts of Boston along a semi-circular stretch of highway called Route 128. Starting in the 1950's, these companies began migrating to southern states that offered rich tax inducements to lure these companies south. The result? Route 128 was left with an abundance of abandoned factories.

---

[7] Jamie Nathanson, Communications Director for the Research Triangle Foundation
[8] Capital Research Group Inc., February 25, 1999
[9] Beth Tomee, Seattle Department of Economic Development

Beginning in the 1970's, technology companies began occupaying these vacated premises because of their close proximity to the nation's largest cluster of research universities. This was the catalyst required to transform a shrinking rust-belt economy into "America's Technology Highway". Stalwart companies such as Digital Equipment, Prime Computer and WANG initiated the charge. An inability to properly diversify led to a near fatal dependence on the single industry of microcomputers and firms such as those presented above were blindsided when personal computers began to unseat minicomputers. The Route 128 corridor lost 30,000 tech jobs in the late 80's to early 90's.

Instead of relocating, however, many laid-off employees established their own firms and by the middle of the 90's, Route 128 was back. By 1997, the area had experienced negative Net employment change in areas such as Defense and Textiles & Apparel, and huge positive gains Software and Communications Services and Innovation Services[10]. The net result was that by 1997, the region had 2,200 technology companies employing 130,000 workers.

TAX CREDITS AND TAXATION POLICY

The general trend we have noticed is that in order to lure high tech companies to a particular region, that region must possess a list of sellable attributes. Silicon Valley can sell its climate and enormous world clout, Seattle can sell Microsoft, and Boston can sell its huge cluster of world-renowned research universities. Once critical mass has been attained, those companies who do locate in those markets do so not to take advantage of tax credits, but to be where the action is.

Maturing markets that are relatively isolated (Austin and RTP) need to compete against these better-established markets, and do so by offering aggressive inducements, usually taking the form of extremely low property taxes and very low state corporate taxes.

FINANCING AND PATENTS

Venture Capital:

A tangible measure of a region's overall health is often caused by the amount of new capital that flows into a region. Venture capital is one of the three main sources of funding used to grow new companies (other sources include personal savings and investment by family, friends and individual [angel] investors). Venture capital investment is a market-driven economic-growth catalyst. The amount of venture capital available in any particular market is a good litmus test of the region's IT vitality. Here are some pertinent figures associated with venture financing in 1998:

City	Total Companies Financed	Total Amount Invested
Boston	N/A	$1,901,000,000.00*
San Jose	69	$410,246,000.00
Austin	50	$206,862,000.00
Seattle	37	$148,666,000.00
Raleigh	13	$31,625,000.00

Source: Regional Financial Associates, PricewaterhouseCoopers 1999; Austin economic development
*Source: Collaborative Economics; Massachusetts Technology Collaborative

Boston has always been regarded as the United States' capital for venture finance, and the region allocates speculative funds to a wide range of industries (it should be noted that from the above figure, approximately 40% was earmarked to Computer Software & Services ($749 million). These figure strongly suggest that as soon as a stable economic environment has been established, it not only eliminates

[10] Massachusetts Regional Financial Associates, Collaborative Economics, November 15, 1999

the need for an IT firm to look elsewhere to locate, but it stimulates new growth and encourages a greater commitment to R&D.

Patents:

An often-used innovation measure is the number of patents issued in a city or region. Patents reflect the initial discovery and registry of innovative ideas. Strong patent activity usually reflects significant r&d taking place. The following table shows how successful each of our subject regions have been in securing patents.

National Ranking	City	1998 Population	# of Patents Issued in 1998
1.	San Jose	1,644,257	3,571
2.	Austin	1,096,529	1,740
4.	Raleigh-Durham	1,061,972	1,185
5.	Seattle	2,283,905	1,076

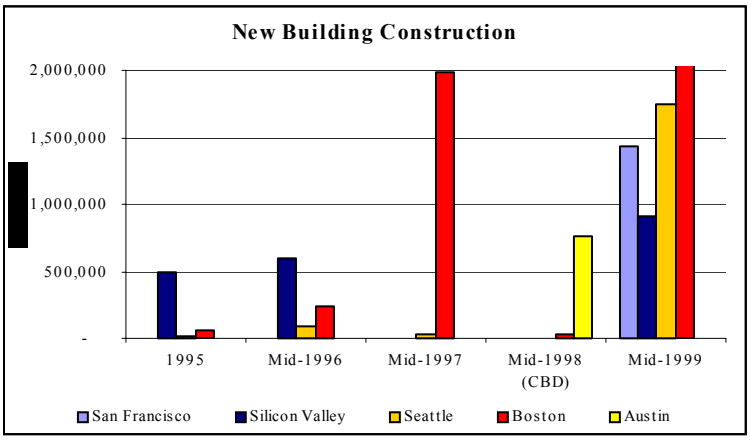
Source: Easy Analytic Software Inc. 1998-1999; Austin economic development

REAL ESTATE PERFORMANCE

The facts and figures presented on the previous pages have been laid out in order to provide a snapshot of the economic conditions that prevail in cities where many Canadians may flock to as an alternative to paying Canadian tax rates. The ultimate purpose of this document is to show how all of these factors may affect real estate. As real estate tends to be an excellent guage of overall business confidence, it would be appropriate to show how real estate in those local markets has performed as the IT revolution has unfolded.

Real estate statistics were not available for Raleigh-Durham, and statistics for Austin were only available for 1998. We have included statistics from San Francisco due to its close proximity to Silicon Valley. In some of these indices, we have measured performance against a "national average", a term that refers to a sampling of 40 of the top North American real estate markets tacked by ONCOR International.

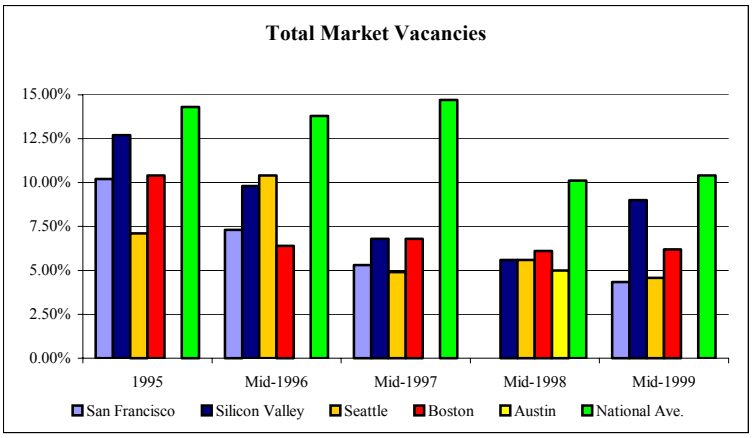
a) New Construction (total square feet under construction):



Market	1995	Mid-1996	Mid-1997	Mid-1998 (CBD)	Mid-1999
San Francisco	0	0	0	0	1,433,587
Silicon Valley	500,000	600,000	0	0	907,248
Seattle	20,000	95,000	28,000	0	1,742,122
Boston	60,000	237,000	1,981,468	31,541	5,178,970
Austin	N/A	N/A	N/A	758,000	N/A

Source: ONCOR International

b) Total Market Vacancies:



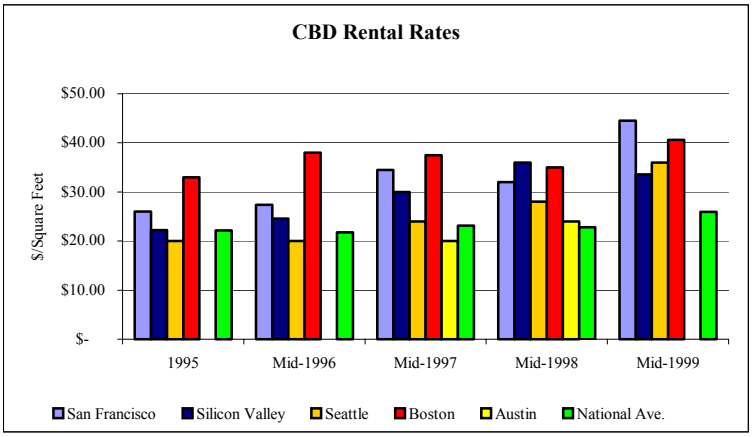
Market	1995	Mid-1996	Mid-1997	Mid-1998	Mid-1999
San Francisco	10.2 %	7.3 %	5.3 %	N/A	4.33 %
Silicon Valley	12.7 %	9.8 %	6.8 %	5.59 %	9.0 %
Seattle	7.1 %	10.4 %	4.9 %	5.6 %	4.57 %
Boston	10.4 %	6.4 %	6.8 %	6.1 %	6.2 %
Austin	N/A	N/A	N/A	5.0 %	N/A
National Ave.	14.3 %	13.8 %	14.7 %	10.11 %	10.41 %

Source: ONCOR International

Analysis:

The most dramatic results come from Silicon Valley and Boston. Silicon Valley's vacancy rate has dramatically dropped forcing a new influx of construction in 1999. With companies clamoring for space, we should expect even greater construction in 2000. Boston's statistics are dramatic. Although huge amounts of new product are coming to market each year, vacancy rates are consistently well below national averages. All markets outperform national averages.

c) Central Business District (CBD) Rental Rates:



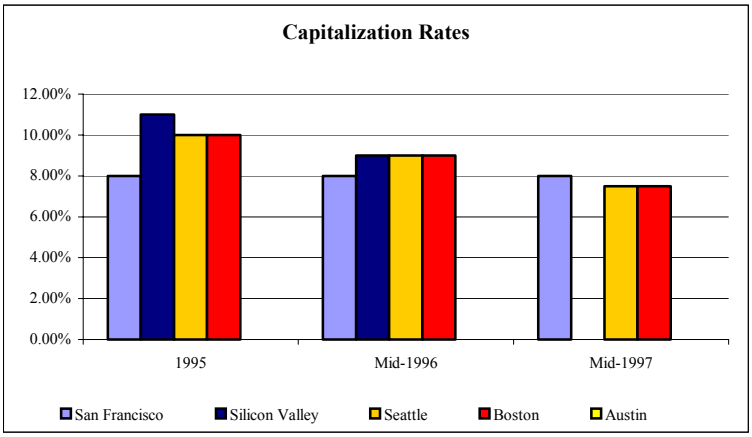
Market	1995	Mid-1996	Mid-1997	Mid-1998	Mid-1999
San Francisco	$26.03	$27.39	$34.50	$32.00	$44.53
Silicon Valley	$22.20	$24.60	$30.00	$36.00	$33.60
Seattle	$20.00	$20.00	$24.00	$28.00	$36.00
Boston	$33.00	$38.00	$37.50	$35.00	$40.61
Austin	N/A	N/A	$20.00	$24.00	N/A
National Ave.	$22.15	$21.80	$23.13	$22.84	$25.95

Source: ONCOR International

Analysis:

In the base year (1995) all markets except for Boston are relatively close to the national average. The differential between these rates and national averages begins to noticeably widen beginning in 1997. Even with new product in 1999, building owners are still able to capture high rents. This is indicative of industry growth (as demonstrated throughout this paper).

d) Capitalization Rates:



Market	1995	Mid-1996	Mid-1997
San Francisco	8.0 %	8.0 %	8.0 %
Silicon Valley	11.0 %	9.0 %	N/A %
Seattle	10.0 %	9.0 %	7.5 %
Boston	10.0 %	9.0 %	7.5 %
Austin	N/A	N/A	N/A

Source: ONCOR International

Analysis:

Capitalization rates (cap rates) measures the what percentage of a building's value is represented one year's net income. This means that as cap rates drop, values rise. From the few statistics we were able to find, we see that cap rates are dropping, which indicates a strong, robust market.

BOLD CANADIAN REAL ESTATE INITIATIVES:

Despite high corporate tax rates imposed at the federal level, and personal income tax rates that are, shall we say, not on the same level as our neighbors to the south, these people believe that effective lobbying will win the day. Provincial governments (especially in Ontario) are fully aware of the obstacles facing the high tech industry and are doing what they can. Ontario Finance Minister Ernie Eves has been among the

most progressive finance ministers in seeking reform, which if sucessful will make Ontario one of the most competitive high tech regions in the world. Despite the fact that the term "Brain Drain" is currently among the most popular terms in the Canadian media, there are still a handful of bold Canadians who recognize that there are areas in Canada that possess the same set of attributes enjoyed by the communities discussed in this paper.

One of these communities is Waterloo Technology Park. This is a new 100-acre technology park focused on R&D activities of companies from information and envirnmental technology sectors. The site is located in Waterloo, Ontario on the North Campus grounds of the University Waterloo, home to the world's largest Mathematics faculty and an international leader in the education of technology professionals[11]. The first phase is a 1.2 million foot complex on 100 acres. It is an initiative whose time has arrived. The surrounding area possesses all the elements of an IT Supercenter, save for an appropriate fiscal policy that is designed to raise R&D expenditures and retain some of the best workers in the world.

Ottawa already has a well-established high tech presence and has often been referred to in Canada as "Silicon Valley North". With more than 800 companies and over 50,000 advanced-technology workers, it has emerged as an IT-friendly region. The region is anchored by industry leaders such as Nortel, Newbridge Networks, Corel and Cognos Inc. The Ottawa area is a centre for advanced research and development in the fields of telecommunications, software, space science and environmental technology. Certainly, the infrastructure for future growth is there. If a more favorable economic environment is created, Ottawa could truly be put into a position to mirror the growth of the "other" Silicon Valley. Again, government intervention is required

CONCLUSION

The dizzying growth of the Technology Sector has had a carryover impact on the growth of the Canadian real estate market. To maintain this growth, it is vital that provinces and municipalities be able to tell a compelling story and wield the financial persuasion to lure new companies to Canada and to keep existing companies in place.

The alternative to the lost taxation revenue will be much more severe than the cost of providing inducements to Technology Sector clients. As existing Technology companies relocate south to the United States, the impact of this migration will go beyond the immediate concern of vacated space: property values will be driven down; construction and related trades employment will decrease; and tax revenues for new development will be lost completely. The collateral impact will have a trickle-down effect as companies overlook Canada as a potential home for their operations in favor of more financially attractive situations elsewhere. If Canada is to become a significant player in the global economy, it must demonstrate a greater amount of flexibility in facilitating businesses to relocate here and a major commitment to retaining the ones that have stayed.

[11] Waterloo Technology Park, Orientation Package