

# FOUNDATIONAL RESEARCH BULLETIN

SUSTAINABILITY BY DESIGN  
*A Design Vision for a Sustainable  
Region of 4 Million*

**DRAFT**

No. 1  
August 2006

## Office park Location and Design: Challenges and Opportunities for a Sustainable Region

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### I. Introduction

The recent growth of suburban style office parks has often be cited as a challenge for Greater Vancouver's Livable Region Strategic Plan (LRSP) as it does not support the network of regional town centres. However, on closer examination business parks are often located close to neighbourhoods, services and transit. In this context, other factors such as the lack of integration with the surrounding street fabric and conventional land use patterns and built forms may be a more significant contributor to transportation / land use imbalances than previously thought.

This paper suggests that the impact of business parks on travel behaviour, land consumption, and environmental quality, among others, could be mitigated if the parks were better designed at a site and district scale and, above all, if they were better integrated into the fabric of streets that surround them.

### II. Office Development Location in Greater Vancouver

The location of jobs is a key element in the fulfilment of the LRSP's goal of *Building Complete Communities*, which targets the development of a network of high-quality, mixed-activity urban centres that support a high level of public transit and a range of community services and cultural facilities<sup>1</sup>. These urban centres, designated as Regional Town Centres (RTCs), are intended to capture a large proportion of suburban office development in order to increase access to regional jobs, improve the region's job balance, support an efficient transit system and serve as a catalyst for overall town centre development<sup>2</sup>.

However, the distribution of office floor space between 1990 and 2000 (*Fig.1-1*) illustrates a growing trend of office development taking place outside the Metropolitan Core and RTCs. This trend has mined the critical mass envisioned by the LRSP for the RTCs. Yet, according to the LRSP 2004 Annual Report, the balance in jobs and labour force location throughout the region is improving, as all subregions [except Vancouver/UEL and Maple Ridge/Pitt Meadows] have shown an increase in the proportion of labour force working in their home subregion in the 1996-2001 period. Currently this proportion varies between 30 to 50%, with the exception of Richmond and Vancouver/UEL with 55% and 65% respectively<sup>3</sup>.

Regional Town Centres offer distinctive advantages over business parks<sup>4</sup>: First, they include better regional transit connections [particularly those centres served by SkyTrain, West Coast Express or B-Line bus service]. Second, they offer excellent community and employee amenities for office employees (including convenient shops

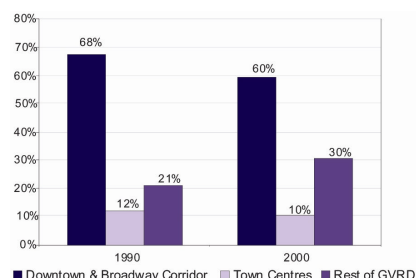


Figure 1-1: Distribution of Office Floor Space, 1990 and 2000

Source:  
Royal LePage "The GVRD Office Market Report 2001" in Livable Region Strategic Plan 2004 Annual Report, GVRD, 2004



Figure 1-2: Location of Business Parks in Burnaby, BC in relation to the LRSP Map.

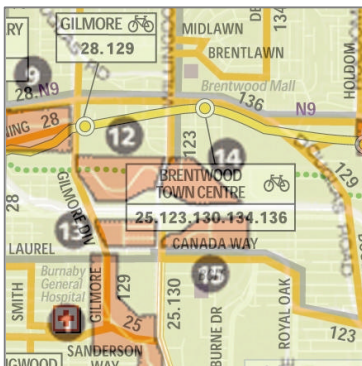
and services, recreation facilities and cultural facilities). Last, they provide residential housing opportunities in a wide variety of housing types and tenure that allow individuals to live more closely to where they work. Yet, as Figure 1-1 illustrates, the location of office development in business parks has been more common than that in RTCs. This success has been explained to be due to relatively low cost land, relatively low cost building structures, a flexible physical building design (build to suit or phased to meet market demand), a variety of ownership options (lease or own) and a location near similar businesses<sup>5</sup>.

The majority of the region's business parks are presently clustered in Burnaby and Richmond. Figure 1-2, overlaying Burnaby's 16 business parks with the LRSP Map<sup>6</sup>, shows how all of them are located outside the designated Regional Town Centres. Burnaby is the most significant office market outside the Vancouver central area, and it is expected that Burnaby's business parks will continue to grow and expand, and capture a large share of future office development<sup>7</sup>.

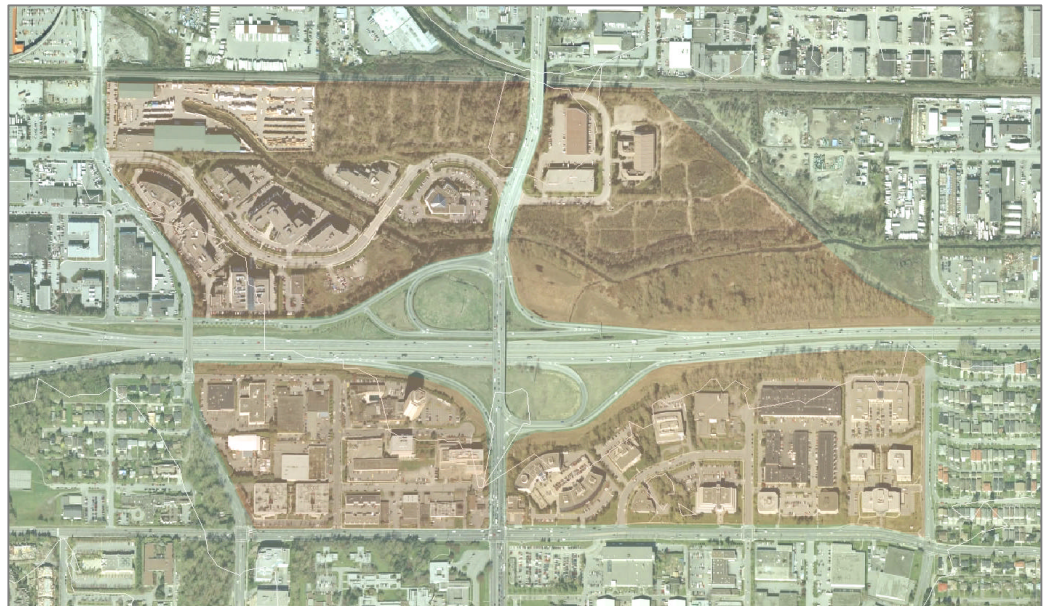
### III. Urban Integration

Business parks are often located close to residential areas, services and transit. Taking Burnaby as an example, over half of its 16 business parks (9 of them, 56%) are found to have public transit running within them. Only 3 (19%) do not have public transit at all, and one fourth have transit running on their limit (*Fig.1-3*<sup>8</sup>).

A closer look at the integration with the surrounding street network of the four business parks in Figure 1-3 (*Fig.1-4*) – those with transit on their edge - reveals all four behave as independent units. The characteristic pattern of large lots grouped together in “campus” settings on cul-de-sacs intentionally frustrates easy connections to surrounding areas. Consequently, distances inside the parks, between them, and to the surrounding residential and retail areas or transit service become longer and less likely to be undertaken on foot, leaving the private vehicle as the most appropriate mode of transport. As isolated single-use locations that are not functionally integrated with other compatible uses such as service, commercial, and residential uses, business parks obstruct the LRSP's goal to *Increase Transportation Choice*, and consequently the goal to *Build Complete Communities*. In other words, one just can not get from one part of a *complete community* to another without a car.



Figures 1-3 and 1-4: Location of Willingdon Business Park (12), Dominion / Canada Way (13), Eastbrook Executive Park (14), and Willingdon Green Business Centre (15) in Burnaby, BC overlaid with skytrain (yellow) and bus (orange) transit system.



## IV. Land Use and Built Form

### *Land Use:*

Business parks follow single-use zoning. Although they do provide a number of office jobs, they do not provide either commercial amenities or residential opportunities<sup>9</sup>. It should be acknowledged, however, that single land use business parks are popular with municipal planners and real estate developers in that they provide certainty of high wage jobs and stability in land value<sup>10</sup>. The wider range of land uses in RTC zoning is believed to create uncertainty with respect to a site's highest and best use and as to adjacent land uses, and puts pressure on land prices. This, together with a fractured land ownership, results in high-land costs and a delayed development timetable.

### *Built Form:*

According to the GVRD, a survey of twelve business parks in Richmond, Burnaby and Vancouver showed an average Floor to Surface Ratio (FSR) of 0.88 (with a low of 0.35 and a high of 1.5), while the average 3.38 FSR allowable for office developments in RTCs (with a low of 0.65 in the Township of Langley and a high of 7 in Surrey City Centre - only near SkyTrain stations)<sup>11</sup>. A comparison of both average ratios results in that, for the same amount of office floor area, office space in business parks consume nearly 4 times as much land as office space in RTCs, by far a less efficient use of the land. Also, lower FSR buildings involve higher energy costs and spread out distances, making it more difficult to serve office parks effectively by transit. FSR ratios of at least 1.5 would seem a reasonable target for regional office park development.

At the same time, business parks' conventional built form includes large setbacks, often with decorative or groomed landscaping. This results in more paved laneways, parking lots and loading areas, and contributes to making distances longer within the park.

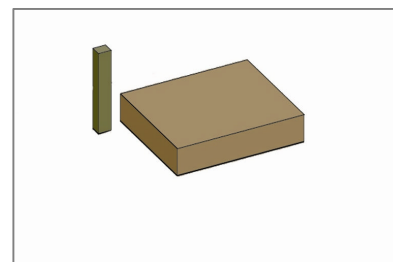
### *Parking:*

Office park locations consume large amounts of land for employee and customer parking, providing an average of 3 stalls per 1,000 square feet of office space, which is much higher than the 1 or 2 stalls per 1,000 square feet typical of the Regional Town Centres<sup>12</sup>. This generally translates to a 1:1 ratio of office space to parking lot in business parks: 1000 square feet of office space inside equals 1050 square feet of surface parking outside. In other words, for every square foot of interior office space an additional square foot of parking is required, cutting land use efficiency in half. Reduced parking requirements and a requirement for structured parking [successfully required at UBC, for example] would reduce auto dependence and increase job density.

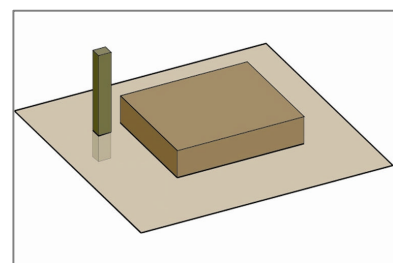
## V. Effects on travel behaviour, land consumption, environmental quality, social equity and municipal economics

### *Travel Behaviour*

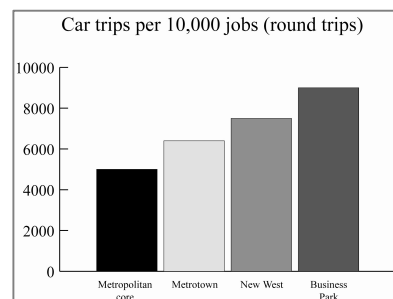
The lack of integration between office parks and their immediate urban fabric combined with the long internal distances resulting from their characteristic land use and built form virtually ensure the private car is almost the only way for employees to get to work. As illustrated in Figure 1-7, the amount of car trips generated by business parks is higher than by RTCs, and almost twice as much as those generated by the metropolitan core. For every 10,000 jobs in office parks, 9,000 car trips (round trips) are generated. Thus a very large proportion (90%) of office workers in business parks driving to work. Taking the example of commuting patterns in Gloucester Industrial Estates, in Langley Township (*Fig. 1-8*), where no employees walk or take transit to work - meaning all employees get to work by car.



*Figure 1-5: Comparing Floor to Surface Ratio in buildings in Town Centres to buildings in business parks. For the same amount of office floor area, business parks consume nearly 4 times as much land than RTCs.*



*Figure 1-6: Adding parking space: When the amount of required parking is added, the land consumed by an office building in a business park doubles while the parking for a building in a town centre is placed underground.*



*Figure 1-7: Car trips per 10,000 jobs (round trips)*  
*Source: GVRD 2002*

**Conventional Travel to a Business Park**  
**Commuting patterns in Gloucester Industrial Estates, Langley Township<sup>13</sup>**

- 0% of employees walk to work.
- 0% of employees take public transit to work.
- 50% of employees spend one hour or more [round trip] commuting each day.
- 50% of employees commute more than 40 km [round trip] per day.
- 20% of employees commute over 80 km [round trip] per day.
- 70% drive from locations 10 km to 60 km west of the industrial park.
- 17% of employees live in Vancouver or its neighbouring municipalities, including West Vancouver, North Vancouver, Richmond and Burnaby.
- 7% of employees live within a 15-minute drive of the park.
- 15% of employees lived in host municipality [Langley Township].

*Figure 1-8: The example of commuting patterns in Gloucester Industrial Estates (Langley Township) illustrates conventional private automobile based travel in business parks.*

*Land Consumption*

Apart from promoting the use of the private automobile as the primary and often only mode of transportation, the distinct built form of business parks reflects an inefficient use of the land, as shown by the FSR and parking data (*Fig. 1-5, Fig. 1-6*). This far higher land consumption of office space located in business parks versus that in RTCs works against the LRSP goal *Achieving a Compact Metropolitan Region*.

*Environmental quality*

Conventional business parks present a series of negative environmental impacts. At the site scale, their parking standards generate large impermeable surfaces, which lead to high volumes of stormwater runoff, altering the area's hydrological balance and water quality. At a regional level, the widely automobile-based travel behaviour reduces air quality in the region, which compromises the health of local residents. At a global level, these transportation patterns increase the release of greenhouse gases, contributing to climate change. According to a research by Sarah McMillan, compared to a town centre location, employees commuting to a business park generate 82% more transportation-related greenhouse gas emissions<sup>14</sup>.

*Social Equity*

The heavy dependence of automobile travel in office parks has additional social consequences, considering transportation costs are often a large portion of the family budget, second only to housing. This portion is often greater for low-income families. The Surface Transportation Policy Project, in the US reveals that for the lowest income families (those earning less than \$12,000 per year) transportation represents 36% of the family budget<sup>15</sup>. New or prospective employees in office parks must own or purchase a vehicle, so individuals without a car, or families with just one vehicle, will have a difficult time accessing jobs in office parks.

*Economic costs*

Although the low cost of the land and relatively low building cost are addressed as two key factors in the success of business parks, there are a series of external costs derived from auto-oriented business parks. On the one hand, the extra cost for employees in the purchase, maintenance, and gas for their cars. On the other, municipalities are incurring opportunity costs of lost tax revenue, as tax revenues generated from business parks are comparatively lower than office buildings in town centres<sup>16</sup>. Given the tendency of these parks to migrate out of town centres, much could be done to integrate them if they were more tightly knit into the arterial matrix that surrounds and feeds town centres.



## VI. Opportunities for a more sustainable performance of business parks

Business parks present a series of distinct urban pattern, land use, and built form characteristics that strongly affect the travel behaviour of employees and customers and their interaction with the natural and urban landscape. The negative impact of business parks has often been accredited to their location. However, it is more likely that site design has a stronger influence on auto dependence than geographic location.

In general, business parks follow isolated, single-use, land consuming patterns, but are frequently located close to neighbourhoods, services and transit. A better design at the site scale holds several opportunities to make these areas more sustainable. First, improving the integration in the surrounding street network by avoiding or retrofitting cul-de-sacs could be a starting point in reducing distances and consequently automobile dependency. Second, establishing minimum FSR would ensure more compact designs, hence contributing to reduced travel distances and land consumption. For instance, applying a minimum 1.5 FSR to current typical business park design would result in a saving in land consumption of 40%. Through increasing density in business parks, municipalities could not only achieve a more efficient use of their land but also increase their tax base. Third, including certain compatible uses (i.e. commercial) would also decrease the need for driving (i.e. for lunch, errands, etc.), and would lead to a higher employee satisfaction. Last, a more efficient use of the land would involve an overall reduction of paved surfaces, which would contribute to the hydrological balance of the region and consequently improved water quality. This could be reinforced by setting a minimum retention, evapotranspiration, and infiltration target of 1 inch per day for industrial parcels.

While the current trend in office park location does not support the Regional Town Centres per se, a different site design combining different strategies such as the ones suggested above opens the possibility to improving the integration and mixture of uses in residential areas, enhancing the even distribution of jobs and housing throughout the region, and hence would be compatible with the LRSP goal to *Build Complete Communities*.

## Notes

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<sup>1</sup> GVRD, 2004. *Livable Region Strategic Plan 2004 Annual Report*, Indicator B4, pp.10 [www.gvrd.bc.ca/growth/pdfs/2004\\_LRSP\\_AnnualReport.pdf](http://www.gvrd.bc.ca/growth/pdfs/2004_LRSP_AnnualReport.pdf)

<sup>2</sup> Livable Centres Program, Regional Development Policy and Planning Department, GVRD, 2003. *Regional Town Centres and Office Development: Promoting Employment in Accessible Locations* [www.gvrd.bc.ca/livablecentres/pdfs/RTCOfficeDevelopment.pdf](http://www.gvrd.bc.ca/livablecentres/pdfs/RTCOfficeDevelopment.pdf)

<sup>3</sup> GVRD, 2004. *Livable Region Strategic Plan 2004 Annual Report*, Indicator B5, pp.11 [www.gvrd.bc.ca/growth/pdfs/2004\\_LRSP\\_AnnualReport.pdf](http://www.gvrd.bc.ca/growth/pdfs/2004_LRSP_AnnualReport.pdf)

<sup>4</sup> Livable Centres Program, Regional Development Policy and Planning Department, GVRD, 2003. *Regional Town Centres and Office Development: Promoting Employment in Accessible Locations* [www.gvrd.bc.ca/livablecentres/pdfs/RTCOfficeDevelopment.pdf](http://www.gvrd.bc.ca/livablecentres/pdfs/RTCOfficeDevelopment.pdf)

<sup>5</sup> Royal LePage Advisors Inc. 2001. *The GVRD Office Market: Supply, Demand and Spatial Distribution*. Report prepared for GVRD [www.gvrd.bc.ca/growth/pdfs/OfficeMarket.pdf](http://www.gvrd.bc.ca/growth/pdfs/OfficeMarket.pdf)

<sup>6</sup> Figure developed by the authors, overlaying *Burnaby Business Centres* and *LRSP Map* [www.city.burnaby.bc.ca/business/centres.html](http://www.city.burnaby.bc.ca/business/centres.html), and [www.gvrd.bc.ca/growth/pdfs/LRSPMap.pdf](http://www.gvrd.bc.ca/growth/pdfs/LRSPMap.pdf)

<sup>7</sup> Royal LePage Advisors Inc. 2001. *The GVRD Office Market: Supply, Demand and Spatial Distribution*. Report prepared for GVRD [www.gvrd.bc.ca/growth/pdfs/OfficeMarket.pdf](http://www.gvrd.bc.ca/growth/pdfs/OfficeMarket.pdf)

<sup>8</sup> Figure developed by the authors, overlaying *Burnaby Business Centres* and *Burnaby Transit Map* [www.city.burnaby.bc.ca/business/centres.html](http://www.city.burnaby.bc.ca/business/centres.html), and [www.translink.bc.ca](http://www.translink.bc.ca)

<sup>9</sup> Livable Centres Program, Regional Development Policy and Planning Department, GVRD, 2003. *Regional Town Centres and Office Development: Promoting Employment in Accessible Locations* [www.gvrd.bc.ca/livablecentres/pdfs/RTCOOfficeDevelopment.pdf](http://www.gvrd.bc.ca/livablecentres/pdfs/RTCOOfficeDevelopment.pdf)

<sup>10</sup> Royal LePage Advisors Inc. 2001. *The GVRD Office Market: Supply, Demand and Spatial Distribution*. Report prepared for GVRD [www.gvrd.bc.ca/growth/pdfs/OfficeMarket.pdf](http://www.gvrd.bc.ca/growth/pdfs/OfficeMarket.pdf)

<sup>11</sup> Livable Centres Program, Regional Development Policy and Planning Department, GVRD, 2003. *Regional Town Centres and Office Development: Promoting Employment in Accessible Locations*, pp14 [www.gvrd.bc.ca/livablecentres/pdfs/RTCOOfficeDevelopment.pdf](http://www.gvrd.bc.ca/livablecentres/pdfs/RTCOOfficeDevelopment.pdf)

<sup>12</sup> Royal LePage Advisors Inc. 2001. *The GVRD Office Market: Supply, Demand and Spatial Distribution*. Report prepared for GVRD [www.gvrd.bc.ca/growth/pdfs/OfficeMarket.pdf](http://www.gvrd.bc.ca/growth/pdfs/OfficeMarket.pdf)

<sup>13</sup> Don Cayo, 2005. *Jobs create a 'commuting footprint: Outlying business parks usually lack public transit service*, article in the Vancouver Sun, Wednesday, November 02, 2005. [Data from GVRD and CB Richard Ellis Research] [www.liveableregion.ca/pdf/jobs\\_travel\\_nov2.pdf](http://www.liveableregion.ca/pdf/jobs_travel_nov2.pdf)

<sup>14</sup> Sarah McMillan, 2004. *Toward a Livable Region? An Evaluation of Business Parks in Greater Vancouver*, pp. 14, Master Thesis in the School of Community and Regional Planning, University of British Columbia

<sup>15</sup> Surface Transportation Policy Project, 2000. *Driven to Spend: The Impact of Sprawl on Household Transportation Expenses*, [www.transact.org/report.asp?id=36](http://www.transact.org/report.asp?id=36)

<sup>16</sup> Sarah McMillan, 2004. *Toward a Livable Region? An Evaluation of Business Parks in Greater Vancouver*, Master Thesis in the School of Community and Regional Planning, University of British Columbia

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