

**LOCAL GOVERNMENTS' RECORD OF ASSESSING THE
IMPACTS OF THE HIGH TECH INDUSTRY ON
OTTAWA'S LAND USE-TRANSPORTATION
RELATIONSHIP: 1970s-2005**

BARRY WELLAR AND NICK NOVAKOWSKI

Preface

This commissioned paper was accepted in 2005 for inclusion in a book of readings titled, **Perspectives on Ottawa's High-Tech Sector**. At the time that the paper was submitted Dr. Wellar was Professor of Geography at the University of Ottawa, and Dr. Novakowski was Assistant Professor of Geography at Memorial University. The book has been evaluated by external reviewers, and it is expected that revisions will be completed in the next several months and the book published this Summer.

The editors of the book have generously consented to having this pre-publication version of the Wellar-Novakowski paper posted on the Transport 2000 Canada website. We are very pleased to make this report available now, because it is very pertinent to on-going and near-future deliberations and decisions involving such matters as Ottawa's Official Plan, Ottawa's Transportation Master Plan, Ottawa's Pedestrian Plan, Ottawa's Cycling Plan, the Mayor's Task Force on Transportation, the mandate of the National Capital Commission in regard to land use planning and development, and the highway expansion program of the Ontario Ministry of Transportation.

Questions about the article should be directed to the senior author, Dr. Barry Wellar, Distinguished Research Fellow at Transport 2000 Canada. He can be reached by email at: wellarb@uottawa.ca.

LOCAL GOVERNMENTS' RECORD OF ASSESSING THE IMPACTS OF THE HIGH TECH INDUSTRY ON OTTAWA'S LAND USE-TRANSPORTATION RELATIONSHIP: 1970s-2005

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INTRODUCTION

For the purposes of this paper, the high tech industry is defined to include firms that engage in research, development, and production or distribution of goods and services in the computer, telecommunications, and emergent technology sectors. Our primary research objective is to describe and analyse the record of local governments in assessing the impacts of the high tech industry on Ottawa's land use-transportation relationship. A secondary research objective, identified during the research design phase of the study, is to provide a preliminary evaluation of the document-based approach that was devised to conduct the investigation. As discussed below, this approach was developed upon realizing that we would not have access to the data needed to empirically examine the impact assessment record of local governments.

We begin by presenting four points of context to provide the rationale behind the structure of the paper. The context points are followed by a brief description of the high tech industry in Ottawa. After presenting the study methodology, we proceed to the paper's core section in which we derive, and then apply, the criteria selected to examine the extent to which local governments assessed the impact of the high tech industry on Ottawa's land use-transportation relationship from the 1970s to the present.

As the first point of context, and beginning with the water mode for lumbering, trade and defence purposes, and moving through the road, rail and air modes, the land use-transportation relationship in Ottawa has been evolving for more than 150 years. However, the high tech industry did not make a strong appearance in the Ottawa area until the 1960s. As a result, while our paper has a temporal window of approximately 40 years, it has to take into account what happened earlier to establish the land use-transportation relationship into which the high tech industry entered in the 1960s.

Second, policies, plans and programs of federal, provincial, regional and municipal governments have all affected Ottawa's land use pattern and densities, the structural and functional characteristics of Ottawa's transportation system(s) and, consequently, Ottawa's land use-transportation relationship. Their contribution to the map of Ottawa's land uses and transportation system components can be summarised as follows.

Federal government involvement in Ottawa's land use and transportation history and geography is represented through the activities of such agencies as Public Works, Transport Canada, and the National Capital Commission (NCC). It is manifested by federal buildings, parkways, the Rideau Canal, the Greenbelt, and segments of the urban greenways system, as well as the 100,000-plus federal employees who buy homes, rent apartments, and make work, shopping, institutional and recreational trips by car, bus, rail, bicycle and/or walking. As shown in Figure 1, the National Capital Region (defined as the jurisdiction of the NCC) includes most of the City of Ottawa, but not all. Further, while the map labels the new Québec-side entity of the Ville de Gatineau, it fails to delineate the full expanse of the Census Metropolitan Area (CMA) of Ottawa-Gatineau as defined by Statistics Canada (and by which demographic statistics are generated for planning, transportation, housing, and other studies). These map features are noted should questions arise about the comparability of our study area with those of other contributors.

At the local government level, as many as 12 municipalities and a regional body made decisions on land use and transportation matters until January 2000, when amalgamation took effect and the (new) single-tier City of Ottawa was created. Through official plans, zoning by-laws, transportation master plans and other instruments, these local governments were and are responsible for deciding which non-federal lands are used for what purpose, and the transportation connections between those lands.

Figure 1. The City of Ottawa and the National Capital Region.



Source: City of Ottawa (2003a).

Third, while debates and decisions about where to locate high tech firms came to the fore in the 1980s and 1990s, it is necessary to examine planning processes from a number of years earlier. That condition applies because development activities in 1995, 2000 or 2005 could be shaped by planning decision made in 1955, 1965, 1975, 1985, and so on.

As discussed below in the Study Methodology section, the approach taken to conduct this research is to use planning documents produced in the 1960s and 1970s as the basis for examining local governments' record of assessing the impacts of the high tech industry on the land use-transportation relationship. These documents contain many of the normative statements that characterise current land use and transportation goals, objectives and principles, so we are comparing 'apples to apples' insofar as the then-and-now aspects of land use and transportation planning are concerned.¹ Moreover, comparison of local government vision statements, mission statements, and other planning reports

¹ Informal tests of the validity of a planning document-based approach for impact assessments are provided by the newspaper search and review procedure used by B. Wellar while at the Ministry of State for Urban Affairs in the 1970s (Wellar 1975), in research and courses in planning at the University of Ottawa 1979-2004 (Wellar 1981, 1990, 2000), and for a commissioned report on the Ontario Municipal Board (Wellar 2004).

printed over the decades reveals a very high degree of similarity. This degree of association connecting the early 1970s, the present, and the years in between lends further support to our research design decision to take as long a look at the local government impact assessment record as documentation and study resources allow.

Further, in terms of then-and-now considerations, the high tech industry was a known entity in the National Capital Region in the 1970s. By that time Canada had gained recognition as a world leader in the computer/communications field, and the (former) Department of Communications and (former) Department of Industry, Trade and Commerce had introduced Canadians in general and Ottawa residents, firms, and local government officials in particular to the emergence of a high tech industry.² As shown below in the section on the impact assessment approach developed for the study, individuals responsible for producing the planning documents that we reviewed were cognizant of the burgeoning telecommunications field and its potential capacity to significantly modify Ottawa's land use-transportation relationship.

Fourth, there is the matter of establishing whether our study has already been done or, if not, if it has been done in part. In the former case there might be no need for this paper, and in the latter circumstance it would be necessary to acknowledge any related work and incorporate as appropriate.

Our review of the extant literature revealed that the former Region of Ottawa-Carleton, the former cities of Ottawa, Nepean and Gloucester, and the current City of Ottawa funded numerous land use, transportation and development studies, conferences, visioning exercises, and public consultation projects over the past three decades, many of which had price tags in the range of \$200,000 to \$300,000. Indeed, several of the initiatives that involved international participants, economic development concerns, large-scale transportation issues, or extended study periods were considerably more costly and had million dollar budgets. However, examination of reports from these policy, planning, development, and research activities hosted by the area's local governments did not yield any evidence of an empirical assessment of the impact of the high tech industry on Ottawa's land use-transportation relationship.

Further, the review of the published reports did not yield any non-trivial additions to the knowledge base about Ottawa's land use and transportation 'systems', nor of the evolving land use-transportation relationship. And, to complete the literature review cycle, our review did not identify any contributions made by those projects and studies to the theoretical or applied research methodology underlying land use and/or transportation studies.³

This brings us to the secondary research objective. As noted above, this element of the paper was added as a result of learning that although area municipalities have sponsored numerous expensive, topically-related studies and projects over several decades, contributions to impact assessment information and methodology were extremely limited in scope, depth and utility. In response to the findings about the limitations of research, visioning, etc., done to date, therefore, and the apparent likelihood that the pattern would continue unless an alternative is presented, this paper was re-designed to take on an added research task. That is, as a contribution towards 'raising the research bar' in Ottawa and elsewhere, the paper includes an evaluation of whether our approach of 'revisiting' statements in official plans and associated documents serves as an effective, pertinent means to examine local governments' record of assessing the impact of the high tech industry on Ottawa's land use-transportation relationship.⁴

² B. Wellar was Senior Research Officer and Senior Policy Advisor at the Federal Ministry of State for Urban Affairs in the 1970s, and frequently served as a delegate on Interdepartmental and OECD Panels on computers/communications and information technology. The high regard for and understanding of Canadian contributions to the emerging 'information society' were witnessed on numerous occasions at the international, national, and local levels, and were seen in the 'press packages' which reported on high tech articles, editorials, letters, stories etc. that frequently appeared in area newspapers as well as on area radio and television broadcasts.

³ A newspaper search and review was also undertaken in anticipation that a consultant, visiting expert or member of staff of a local government might offer a relevant observation in regard to the impact assessment topic. However, analysis of numerous columns, editorials, articles, letters, etc., that referred to or discussed the projects and reports also failed to yield any findings or insights that could contribute to the design of this paper.

⁴ The larger question of the general validity of this approach as a means of achieving both substantive subject matter and methodological contributions to current planning, transportation, and impact assessment studies is a topic for another paper.

INTRODUCTION TO OTTAWA AND ITS HIGH TECH INDUSTRY

The Ottawa-Gatineau census metropolitan area (CMA) had a population of 1,063,664 in 2001, and since 1996 experienced a growth rate of 6.5%—well ahead of the national average of 4% (Statistics Canada, 2004a). Within the CMA, the Ontario side experienced an even higher rate of growth at 7.2%, yielding an increase in Ottawa's population from 751,646 in 1996 to 806,096 in 2001 (Statistics Canada, 2004b; 2004c). Median family and per capita incomes in Ottawa exceed those in all of Canada's major cities, as do levels of educational attainment and per capita green space (Statistics Canada, 2004d).

As stated in the Introduction, the National Capital Region (NCR) roughly approximates the boundaries of the Ottawa-Gatineau CMA. The city's jurisdictional complexity is compounded by the presence of the federal government as both a decision maker affecting local land use and transportation decisions, and the region's dominant employer. In 2003, there were 112,310 federal employees in Ottawa-Gatineau, which represents an annual increase of 3,000 to 6,000 employees per year since 1999 (Statistics Canada, 2004e).

At the peak of the high technology boom in 2000, high tech employment reached 85,000 and for the first time exceeded federal employment on the Ottawa side of the Ottawa-Gatineau CMA. However, more than 20,000 technology-related jobs were lost following the stock market crash and high tech sector downturn over the summer of 2001, leaving only 64,500 high tech employees in 2003 (Harrison, Cooper and Mason, 2004). Once again, the federal government became the City of Ottawa's dominant employer. As of this writing, high tech employment has not recovered to levels experienced in 2000, but it remains the area's major non-governmental employment sector.

In addition to numbers of employees being of importance to this study, the structure of the high tech sector is also pertinent. That is, there are three basic types of high tech company, and each type provides or offers different products or services, which could be cause for them to have different impacts on Ottawa's land use-transportation relationship. Since other papers discuss these differences in detail, we focus our remarks on the transportation aspect and mention illustrative technologies and companies.

- **High tech manufacturing.** These firms produce computers, high tech equipment (aeronautics, medical technologies), peripherals and components. Their transportation preference is for superior road, rail, air and sea connections in order to move their products to their markets.
- **Communications services.** These firms sell equipment or products (computers, cell phones, satellite TV), and/or provide support or services (call centres, Internet Service Providers (ISPs)) for equipment purchasers. They require superior infrastructure including trunk phone lines, fibre optic cables and satellite systems. A location close to markets is vital for ISPs due to long distance charges, but not for call centres using international 1-800 numbers.
- **Technology-related services.** Characterised by such higher-end functions as software design and development, and computer training, this type of firm wants to be part of a local networking of businesses and expertise that is clustered.

Over the history of the high tech industry in Ottawa, each of these types of enterprise has been well-represented. However, the movement of companies into the Ottawa area to join the existing sets of high tech firms has been relatively limited. Rather, the high tech industry is considered 'home-grown', with its origins primarily related to the presence of federal government agencies (National Research Council, Department of Defence) and the associated spin-offs involving each type of high tech firm.

The first wave of start-ups began in the 1950s, and focused on defence-related technologies. In the 1970s and 1980s, the telecommunications start-ups began (Mitel) along with computing equipment (Gandalf Technologies, Norpak), lasers (Lumonics) and software (Cognos). In the late 1990s, biomedical and telecom-related development began to emerge in photonics, optical networking, and wireless technologies (Wolfe 2002; Harrison, Cooper and Mason, 2004). As indicated, while Ottawa's high technology industry is dominated by information and communication technology (ICT)

firms, these enterprises are only part of the city's high tech industry profile. Semi-conductor development, software design, and the emerging photonics sub-sector are also important elements, as are the emerging sub-sectors in the life sciences, biotechnology and biomedical devices (Wolfe, 2002).

By way of comparison, and accepting that the definition of high tech employment varies from country to country and agency to agency, it appears to be widely recognised that the only area in North America with a higher per capita rate of employment in high tech is Silicon Valley in California (Ottawa Business Journal, 2004). Moreover, and of considerable significance to the land use-transportation relationship and the research objectives of this paper, more than 90% of Canada's R&D in telecommunications is undertaken in the Ottawa region (Harrison, Cooper and Mason, 2004).

In summary, the high tech industry has emerged as a major force in Ottawa's economy, and the presence of firms from each of the three basic types of high tech company makes the industry's impact on Ottawa's land use-transportation relationship a matter of major policy, planning and development significance.

STUDY METHODOLOGY

In this section, we establish the rationale and validity of the approach taken to conduct the impact assessment (IA) review. As a brief note of context, IAs are longitudinal rather than cross-sectional studies, and are based on datasets that permit ascertaining the direction and strength of multivariate relationships over extended lengths of time and multiple geographic areas or regions. However, and as discussed in previous reports on the technical capabilities of local governments to undertake or contribute to IAs (Wellar 1981; 1996; 2003), few cities in Canada can support that kind of robust study for even the past year, much less for the past decade or, even more unlikely, for the past two, three or four decades.

Regrettably, for the purposes of this paper, local governments in Ottawa-Carleton were no exception to the rule. Despite all the studies, summits, projects, etc., which have been funded over the years, no report describing a multivariate, longitudinal, quantitative impact assessment was located, nor did we encounter any indication that such an assessment of the impact of the high tech industry on Ottawa's land use-transportation relationship was under consideration. As a result, we could not use the inputs and outputs of the traditional IA approach to establish and examine the IA record of local governments regarding high tech and the land use-transportation relationship. And, we were precluded from undertaking even a partial, empirical IA study due to lack of access to needed data.

That combined shortcoming—no prior IA studies by local governments and no IA database—meant that the original research design needed to be replaced by an alternative IA approach. However, a search of the literature did not yield any tested precedents that we could follow, nor any advice on devising a 'Plan B' for examining local governments' IA record.

Fortunately, our familiarity with the planning documentation on Ottawa enabled us to identify an alternative approach for this impact assessment review. The approach involves 'back-tracking', and is based on identifying statements made in local government documents some 20 or more years ago which are totally or largely consistent with statements made over the intervening years, and are made in recent or current planning documents. These statements can represent goals, objectives, principles or practices. Their key feature is that they allow us to ascertain whether and how local governments had regard for the impact of the high tech sector on the land use-transportation relationship over time and space in the City of Ottawa.⁵

Upon acquiring that information, an assessment can then be made as to the degree and extent that the land use-transportation relationship was affected by the high tech industry. This activity includes identifying changes that the sector caused to be made to Ottawa's land use and transportation goals, objectives, principles or practices and, consequently, to the land use-transportation relationship.

The next section outlines the IA approach designed for this paper. It bears emphasizing that this is not a funded study. As a result, while our research design adopts a broad scope when setting out the

⁵ While elaboration of this observation is beyond the scope of the present paper, a preliminary examination suggests that this approach lends itself to other types of impact assessments for Ottawa, and it may also be applicable to other Canadian municipalities.

study parameters, we are obliged to be selective in terms of the amount of detail that we can provide and the intensity of our analysis.

THE IMPACT ASSESSMENT APPROACH

In the next several pages, we present sections from several planning reports in order to establish the rationale and validity of our approach. As indicated, the statements make a substantive case for using this documentation as the foundation for ascertaining and evaluating the local government record of assessing the impact of the high tech industry on the land use-transportation relationship. The underlining is added to draw attention to terms and phrases which are directly pertinent to the research objectives of this paper.

This report on travel forecasts establishes the future travel requirements of the first two development stages of the Region's draft Official Plan. It is therefore concerned with the inter-relationships between land use and transportation, the forecasting and analysis of future travel, and the establishment of the balance between the various components of the transportation network in accommodating this travel. The next report is a preliminary examination of the implications of rapid transit in the Ottawa-Carleton Region in terms of possible routes, station locations, system characteristics, impact on development and development options (RMOC, 1973, p. i).

The existing transportation system is definitely inadequate to meet this three-fold increase in travel demand (RMOC, 1973, p. iii).

Not only is the existing road system limited in terms of high capacity 4-6 lane facilities, but also is characterised by lack of continuity and inadequate crossing across travel barriers such as the Ottawa and Rideau Rivers [sic]. The Queensway is the only continuous high capacity east-west facility. No continuous high capacity facility, even of an arterial nature, exists in the north-south direction (RMOC, 1973, p. iii).

The existing public transportation system in Ottawa-Carleton is limited to a conventional bus system and a few express routes operated during peak periods...A recent survey indicated that less than 10 percent of person trips in an average week day in 1972 used public transportation in the study area...Therefore, under existing conditions the road system is carrying over 90% of daily person trips. In order for this system to carry the projected travel at the present level of congestion, transit must carry a minimum of 63% of peak hour travel throughout the study area (RMOC, 1973, p. iv).

Such levels are possible to achieve in certain locations provided that the transit system is substantially improved, and the public not only supports the improvements but also uses the provided services in preference to private transportation. However, the attainment of this extent of transit usage everywhere in the region is impractical. For public transportation to attract high proportions of trips throughout the study area and throughout the day, it has to extend its improved service far beyond what is envisaged and its exclusive rights-of-way have to penetrate most neighbourhoods and communities...Travel projections and analysis made in this report suggest the need for improvements of both public and private transportation facilities. The study indicates substantial road requirements are in the east-west direction south of the Base Line [sic]/Heron Road, and across the Ottawa River to the east and west of the Region. This is because the projected population and employment distributions result in substantially high travel demands in these locations (RMOC, 1973, p. v).

The distribution of future population and employment is fundamental to any plan for the Region. In many previous studies, these distributions have been prepared as relatively fixed forecasts which must then be served by transportation facilities, water, sewer and other services. In practice, this approach does not permit changes to be made when major problems arise at a later stage in the planning process. To overcome this limitation, the approach taken in preparing a plan for the Ottawa-Carleton Region is to assume a number of possible future population and employment distributions whose implications for public services will be tested (RMOC, 1972, p. 83).

There are two basic options for the location of jobs. One is concentrated employment within the Greenbelt; the other is more dispersed employment with a correspondingly higher number of job opportunities in the specified growth areas. Similarly, there are two alternatives for population. One is a concentrated, dense development within the Greenbelt; the other is to have fewer people located within the Greenbelt and the population outside concentrated in growth areas (RMOC, 1972, p. 83).

Analysis of present growth patterns indicates that the population in the National Capital Region may reach 1,400,000 persons within 25 to 40 years time, depending on the rates of growth in the local economy,

attitudes to family size and the degree of migration into and out of the Region. When this population is reached, it is estimated there will be 1,000,000 persons living and 450,000 working in the Regional Municipality of Ottawa-Carleton...There are many ways to distribute this future growth. The preliminary evaluation of alternative concepts for urban growth in the Ottawa-Carleton Region indicated that either satellite towns or urban corridors outside, but adjacent to, the Greenbelt represented the most satisfactory way of accommodating future urban development (RMOC, 1972, p. 84).

Further, since many of the land-use controls in the region are weak, it is simply not practical to apply restrictive policies to existing developments, because they will merely result in a greater dispersal of such activities than already exists (RMOC, 1972, p. 136).

Consideration as to what could be achieved through changes in behaviour compels the realization that traffic congestion is largely an artificially created phenomenon. The human race has elected to behave in a certain manner, and traffic congestion is a direct result of this decision. Similarly, the introduction of a high-capacity transit system is intended to reduce congestion, but it appears to induce even greater development, which in turns [sic] leads to just as much and often more congestion than existed previously.... If the urban environment is truly valued, it should be accepted that there is a definite limit to the number of people who can be comfortably and conveniently moved in any area, whether on a local or a regional scale, without significant damage to the urban environment. It should be an important issue as to whether a high-capacity transit system that will stimulate this kind of high-density redevelopment and increased congestion is really to be desired. Perhaps greater thought should be given to the capability of telecommunications to decentralise employment, thereby permitting the development of new towns, or the revitalization of towns that are now dying while just a few metropolitan areas in Canada continue to grow dramatically (RMOC, 1972, p. 140).

As these excerpts and numerous other statements in the planning documents make clear, it was known in the early 1970s that Ottawa was already being challenged by a difficult land use-transportation relationship. And, it was also recognised 30 years ago that significant public interventions—policies, plans, programs, as well as basic changes in the attitudes of individuals and corporations—would be required to prevent a worsening of the land use-transportation relationship.

Further, and this is a key methodological point, the essence of those excerpts appears in City of Ottawa documents produced since amalgamation in 2000. Moreover, to further confirm their continuity over time, similar-to-identical statements appeared in reports published by the Region of Ottawa-Carleton, the City of Ottawa, and other local municipalities in the 1980s and 1990s. Therefore, it is our position that the reports provide a pertinent, representative body of documentation upon which to base this impact assessment review.

It is our further contention that these background documents also provide the means for using the planning issues, goals, objectives and principles statements of 30 years ago to conduct this assessment. That is, a normative approach is used in the planning field to specify what land uses should go where, when, and to specify how those land uses should relate to and be connected by the transportation system. Therefore, it follows that if there are a sufficient number of pertinent, representative normative statements in the ‘official’ literature, then it is appropriate to use that documentation as a basis for examining the local government record of assessing the impacts of the high tech industry on Ottawa’s land use-transportation relationship.⁶

Before examining the IA record of local governments, one more step is required to link the planning documents of the 1970s with those of today. This may be referred to as passing the ‘relevance test.’ The purposes of this test include ensuring that the matter under study is actually of public interest, that the study premises are sound, and, in particular, that the rationale used to justify the comparative study approach is sound.

⁶ Readers familiar with official plan (OP) reviews will appreciate that what is proposed here is identical to that process, but with a twist. Unlike the typical OP review that only goes back five years or so, we are taking into account what was written 30 or more years ago. And, readers familiar with cumulative impact assessment procedures will also appreciate the argument made. That is, in robust IAs which recognise connectedness among system events and processes over time and space (Wellar and Novakowski 2000), it is logically reasonable to use the 30-year timeframe in the urban domain, and especially when the research problem involves 30-40 years of industrial activity and a land use-transportation relationship that has been evolving for more than 150 years.

By way of brief comment on the relevance test (for a detailed discussion of this topic see Wellar 1998a), if circumstances have changed over the intervening time period then the impact assessment–related concerns of three decades ago may no longer exist. Or, they could be different. Application of a relevance test serves to ensure that we are in fact comparing planning apples to planning apples in our examination of local governments’ record of assessing the impacts of the high tech industry on Ottawa’s land use-transportation relationship.

One element of the relevance test applied to this study’s research design has its origins in the popular literature; that is, newspapers. The thesis to be tested in this situation involves a three-stage process, and begins with ascertaining whether it is possible to locate articles, letters, columns or editorials regarding the ‘coulds’ and ‘shoulds’ of planning that were published in daily and community newspapers over the years, and which are relevant today. Further, to be specific to this paper, the items would be comparable in content to current newspaper items regarding the impact of the high tech industry on Ottawa’s land use-transportation relationship. And more importantly for the methodology of this then-and-now study, the items would also provide insight and direction into the scope, depth, and regard which current City of Ottawa official documents should give to assessing the impact of the high tech industry on Ottawa’s land use-transportation relationship.

If all those conditions are met, then it may be concluded that the impact topic is of abiding public interest, that use of the long-term perspective is appropriate, and that our comparative analysis is on methodologically-sound ground. In the next section, we explore this three-stage thesis in terms of its implications for this study in particular, but with an eye to potential applications in other situations and locales.

CONTRIBUTION OF NEWSPAPERS TO LOCAL GOVERNMENTS’ RECORD OF ASSESSING THE IMPACTS OF THE HIGH TECH INDUSTRY ON OTTAWA’S LAND USE-TRANSPORTATION SYSTEM RELATIONSHIP: 1970S TO 2005

The role of newspapers as an important source of documentation on public discourse in Ottawa-Carleton is demonstrated by the report, *Newspapers as a Source of Fact and Opinion on Pedestrians’ Safety, Comfort, Convenience: A Keyword-Based Literature Search and Review* (Wellar, 2000). That work was undertaken as part of the Walking Security Index (WSI) project, and represents one of the more complete guides on why and how to document and differentiate among the contributions that elected officials, professional staff and citizens make to public policies, plans, programs and projects through newspaper articles. Following the framework of that model, a selection of articles typifying newspaper reportage on Ottawa’s high tech, land use and transportation evolution over the past 25 or so years is presented in Table 1.

Based on a review of extensive clippings files that begin with entries from the early 1970s, and a search of library holdings at the University of Ottawa and the Ottawa Public Library, it appears that well in excess of 30,000 items—editorials, columns, features, news stories, public meeting announcements, letters to the editor—have been published on high tech, land use and transportation topics by area newspapers—dailies, weeklies, bi-weeklies, monthlies—since the early 1970s. While the 30,000+ figure may appear impressive, the volume of articles alone is not sufficient to establish the importance of the high tech impacts to the evolution of Ottawa, nor to necessarily cause the impacts to receive the considered attention of local governments. However, if the articles also involve **people of influence**, then the reportage could be construed to have the authority needed to command the attention of local governments charged with addressing impact-related matters. We believe the following observations make that case.

The article titles in Table 1 typify many of the approximately 900 articles reviewed for this study. That is, there are strong similarities in terms of issues, involved parties, circumstances, perspectives, lines of argument, etc. Examination of the articles presented in Table 1 reveals that the following groups of people of influence have made frequent, substantive contributions to this area’s public discourse on the impacts of the high tech industry on the land use-transportation system relationship:

- Municipal, regional, provincial and federal politicians;
- Local government staff in planning, economic development, transportation, engineering, finance, and infrastructure development;

- Academics and researchers from the Ottawa region, as well as from across Canada and abroad, in such fields as urban and regional planning, urban geography, economics, public administration, transportation, political science, transportation planning, computers/communications, and engineering;
- Owners and managers of high tech firms, development companies, engineering firms, building contractors, and all manner of consultants;
- Newspaper editorialists and columnists;
- Community associations and interest groups from across the region; and, most importantly,
- Ordinary citizens who elect politicians, pay taxes, and enjoy or suffer the consequences of decisions and actions that affect and are affected by the impacts of the high tech industry on Ottawa's land use-transportation system relationship.

In addition to the quantity of articles and the involvement of people of influence in the discourse, there is the central matter of article content. As a reading of the selected articles reveals, while our primary focus is on articles that make direct or indirect reference(s) to impacts, the articles also have regard for the **contexts** in which impacts are presented, discussed, assessed and, ultimately, addressed (or not) by local governments.

Table 1. Newspaper Articles Typifying the Public Discourse on Ottawa's High tech, Land Use and Transportation Issues, Visions, and Challenges: 1970s to 2005.

Newspaper Article Title	Yr.	Nwsp*	Topic(s)**
Taking steps towards the end of the automobile era	75	A	1,2,3,4,5,6
Bravely inconvenient	79	B	1,2,3,5
Our capital of tomorrow	79	A	1,2,4,5
Ottawa seeks high-tech firms	80	A	4
Many skills in shaping future cities	82	A	1,3,6
Transitway cost doesn't worry Queen's Park	84	A	5
Regional officials urge new roads, east-west extension of transitway	85	A	2,5
The transitway: Has it failed to 're-shape the urban structure'?	85	A	1,2,3,5,6
Traffic worries hang over Orleans development	85	A	3,5
Road use outpacing construction: survey	87	A	5
Change regional road priorities, says Clark	88	A	2,3,5
No need to delay wider Queensway: region	88	A	5
Balanced development urged for March Road	88	A	3,5
Comparing notes: Region looks south for ways to cope with growth	88	A	2,4
Road woes region's fault, MPP says	89	A	5
No road funds, subdivision threatened	89	A	2,5
Planners tackle traffic-clogged Merivale Road	89	A	2,5,6
Let's pave everything	89	A	5
Technology could reduce negative impact of cars	89	A	3,5
Ottawa's Official Plan loses sight of people	90	A	1,2,3,6
The lowdown on the hi-tech sector	90	A	4
Battling for Ottawa's future — Both sides rap city's new plan	90	A	1,2,3,5,6
Development approval process to be reviewed for better efficiency	92	D	2
Auto-Free Cities — Breaking the car addiction	92	A	1,5,6
Searching for the right mix—New developments revive the old idea...	93	D	2,5
Kanata expansion battle key to regional future	94	A	1,2,3,4,6,7
Politicians clash over plan to halt growth of suburbs	95	A	1,2
Kanata expansion doesn't mean urban sprawl, supporters contend	95	A	2,3
A disappointing debut — Many regional councilors...land developers	95	A	1,2
Kanata: It just keeps on growing	95	C	2,3
Stopping urban sprawl — Intensification in the downtown core...	95	A	1,2,3,4
Regional councilors fail first test	95	A	1,2,3,6
Urban sprawl: Other cities show us the dangers of uncontrolled development	96	A	1,2,3,4,5,6
Regional Council approves plan that puts brakes on urban sprawl	96	A	1,3
Builders, politicians fight suburban growth limits	96	A	2,3
Developers are the winners as region moves to trash official plan review	96	A	1,2,3,6
Ottawa now doing less with less	96	A	1,6
Regional plan steers growth to inner city	97	A	1,2,3,4,5,6,7
Future of development at risk: Developers scramble to prevent new Ottawa bylaw	97	D	2

Population map shows our future	97	A	6
Ottawa's development 'explosion'	99	A	1,2,3,4,5,6,7
A map for Ottawa's future?	00	A	1,2,3,4,5,6,7
Board warns area too reliant on technology	00	A	4
High-tech boom faces roadblocks	00	A	4,5,6
High-tech boom might crash	00	A	4
Snow crews can't keep up with area's growth	00	A	1,2,3,4,5,6
East end of region is neglected on road projects	00	A	5
New group tackles development 'crisis'	00	A	2,3
South Nepean's old roads can't carry the high-tech expansion	00	A	2,4,5,6
High-tech demands are '1960s thinking'	00	A	1,2,3,4,5,6,7
Making sure the east shares in Ottawa's growth	00	A	2,5,6
New council must reject bid to downgrade role of planning	00	A	1,2,3,5,6
Combating commuter crawl	00	A	1,2,5
Everything's coming up buildings	00	A	4
Roadblocks to future growth	00	A	5
How to avoid a sprawling metropolis	00	A	1,2,3,4,5,6,7
Region sharpens attack for infrastructure funds	00	A	2,4,5,6
Managing rapid growth top priority in suburban ward	00	C	1,2,3,4,5,6
Ring-road scheme just a ruse to allow more urban sprawl	01	A	1,2,3,4,5,6,7
City needs a new plan -- 'Bursting out of our seams'	01	C	2,3,5,6
And maybe another bridge—MPP announces ring road study...	01	A	2,3,5,6
San José gives Chiarelli wake-up call	01	A	2
Light rail: Aggressive bid chugs forward	01	D	2,5
Growth plan not business as usual	01	A	1,2,3
'Smart growth' can't be smart if it's predisposed to growth	01	A	1,2,3,7
Now's the time to make plans for bigger city	01	A	1,2,4
Top-quality transit system must be a priority, planner says	01	A	2,4,5
Infrastructure delay shouldn't be an option	01	D	2
Biz groups getting road-weary	01	C	2,5
Growth summit important to future of our communities	01	G	1,2,3,4,5,6
Flaherty targets 'gridlock threatening quality of life'	01	A	5,6
Planning sustainable business parks	01	D	1,2,3,4,5,6
City drafting 'important' new blueprint for growth	01	A	1,2,3,4,5,6
Kanata died long ago, plundered by development	01	A	1,2,4,6
A blueprint for Ottawa	02	A	1,2,3,4,5,6,7
Feds to invest \$6.9 M in west-end roads	02	D	4
City's official plan stalls on transit	02	A	1,2,4
The nightmare coming to Nepean South	02	A	5
Smart Growth policies are nothing new	02	E	1,2,3,5
City heading for 'traffic heart attack'	02	A	1,2,5
Move ahead on the 417	02	A	5,6
Players pan city plan	02	C	2,4
Opportunity knocks: Report urges economic diversity	02	C	2,4,6
Economic development strategy takes shape	02	D	2,4
City's growth lies in glitz, industry	02	A	2,4,6
Ottawa Transportation Master Plan Workshop	02	C	5
Ottawa council passes official plan, prepares for legal fight with builders	03	A	2,3,6
Kanata expansion needs \$128 M—Who will foot the bill?	03	A	2,3,6
Growth plan scores – committee backs Corel Centre-area concept	03	A	3
Where to draw the line in growth	03	A	1,2,3
Ottawa readies for growth	03	F	1,2,3,4,5,6
And maybe another bridge—MPP announces ring road study	03	A	2,3,4
Mayor's frustrations build	03	B	2,4,6,7
Take a new look at this high-tech town	03	A	4
Say no to growth you can't afford, city told	03	A	1,2,3
No end in sight to Barrhaven bottleneck	03	A	1,2,3
Why light-rail is seen in Ottawa's future	03	A	5
Let's hear the case for massive Kanata expansion	03	A	2
Hi-tech woes slow development plans	03	C	4
Putting Ottawa on the Tech Map	03	A	4
\$4B building boom as good as it gets	03	A	2,4
Evolution of the urban vision	03	A	1,2,3,6
Urban sprawl, gridlock blamed for slow rush hour traffic	03	A	1,2,3,4,5,6,7
The Queensway is big enough	03	A	1,2,4
Stittsville fed up with developers	03	A	1,2,3

Outdated transportation figures provide basis for new official plan	03	H	1,2,3,4,5
Our telecom sector won't be able to absorb the huge numbers of laid-off high-tech workers	03	A	4
'Cluster' economies recipes for ghost towns, Conference Board says	04	A	3
The worst is over—Techweekly's panel of experts...Ottawa's tech scene	04	A	3
Widening Queensway won't help: Professor	04	A	1,2,3,4,5
Ottawa's public transit hypocrisy	04	A	1,2,3,4,5
Back to the future: Buzz words fly at planning confab for the century	04	C	2
Go west, young firms	04	C	4
West sector space glut swells	04	A	4
Ottawa's bus to nowhere	04	A	1,2,3,4,5
Ottawa is a place that 'drives people to drive'	04	A	1,2,3,5
Grands parleurs, petits faiseurs	04	I	1,2,4,5,6
Before you build it, they must approve it	04	A	2
This train ain't bound for glory yet	04	A	3,5,6
City to debate light-rail expansion	04	A	2,3,5
O-Train is essential to city's growth	04	A	2,5,6
Route reductions run counter to city's goal of achieving 'smart growth'	04	A	1,2,5
Transpo cuts hit route map	04	C	5,6

*Legend for newspapers: A = Ottawa Citizen; B = Ottawa Journal; C = Ottawa Sun; D = Ottawa Business News; E = The News; F = Globe and Mail; G = Kanata Kourier; H = Centretown Buzz; I = La Rotonde

**Legend for topics: 1 = planning principles; 2 = development/growth visions, issues, initiatives; 3 = land use demand-supply issues, spatial patterns, trade-offs; 4 = high tech industry; 5 = transportation; 6 = general reference to impacts; 7 = specific reference to the impacts of the high tech industry on Ottawa's land use-transportation system relationship.

Bearing in mind, therefore, that this is a paper and not one of the city's \$400,000 consulting studies, we employ a keyword-based thematic approach in order to satisfy the context condition. Our research design criterion is to select articles on the basis of their discourse on the following fundamental, city-building topics:

- Planning principles;
- Development/growth visions, issues and initiatives;
- Land use demand-supply issues, spatial patterns, and trade-offs;
- High tech in all its manifestations (recall the discussion at the start of the chapter);
- Transportation in all its modes, and its various functional, structural, and user aspects, and as core entries,
- Articles containing general or specific references to the **impacts** of the high tech industry on Ottawa's land use-transportation system relationship.

As shown by column 4 in Table 1, many of the articles cover two or more topics. Further, examination of the articles reveals that no topic 'belongs' to any group of people of influence. Those findings apply to the hundreds of articles reviewed for this study, and prompt the observation that the selected articles are, in fact, typical of the reportage in this field. In addition, two key research design findings can be derived from Table 1, which support our newspaper-based approach for examining local governments' IA record.

First, the newspaper articles provide a clear, unequivocal, 25-year message of concern about the impacts of the high tech industry on Ottawa's land use-transportation system relationship. And, importantly, this concern is shared among all the groups of people of influence noted above—politicians, local government staff, academic experts, business leaders, newspaper people, community leaders, and ordinary citizens. That is, all groups raise questions and give opinions about how the high tech industry could and should affect the land use-transportation system relationship, and they all make suggestions about impacts to pursue (positive) or avoid (negative).

Second, over the past 25 years the messages in newspapers to local governments from the groups of people of influence share a common theme. That is, **formal measures**—policies, plans, programs—are and will be required to ensure that the impacts of the high tech industry on Ottawa’s land use-transportation relationship are positive rather than negative in all of their environmental, social and economic aspects. Or, in other words that might better drive home the point, these inevitable impacts are not always going to be good for Ottawa, nor are they going to be self-correcting, nor are they always going to achieve ‘highest and best’ status on their own. As a result, local governments need to have measures in place to minimise, mitigate, maximise, etc., the consequences associated with the impacts.

Taken in combination, the directed messages of the published articles, their large numbers, and the involvement of all the various groups of people of influence who have engaged in the public discourse on this topic, converge to provide unequivocal support for the paper’s basic premise. That is, in view of the detailed and informative ‘heads-up’ that has been given by 30,000+ newspaper articles, it is reasonable to expect that the impacts of the high tech industry on Ottawa’s land use-transportation system relationship have been, are and will be explicitly and thoughtfully incorporated into the City of Ottawa’s formal planning documents—official plans, strategic plans, development plans, transportation master plans, and other planning-related documents. This expectation is explored in the next section of the paper.

IMPACT ASSESSMENT CRITERIA

A review of the 1970s planning documents yielded a number of ‘shoulds’ to be achieved or avoided, depending upon the perspective used. A selection of these ‘shoulds’ are presented in Table 2 as criteria that could be used to assess the impact of the high tech industry on the land use-transportation relationship. That is, all the criteria selected from the 1970s documents are recently or currently employed in City of Ottawa documents on land use and transportation planning issues, goals, objectives and principles. As a result, they constitute a substantive set of measures, indicators or variables that could be used in empirical, data-based studies to assess whether Ottawa’s land use-transportation relationship has been positively or negatively impacted by decisions and developments involving the high tech industry. And, of particular import to this paper, they can therefore be used to review local government documentation on the topic.

The general content and purpose of Table 2 is self-evident from its structure, and only a brief comment is needed to establish the difference between the two sets of criteria. On the one hand, there are positive impact criteria, which for impact assessment purposes can be expressed as measures, indicators or variables. These criteria represent outcomes to be sought as a consequence of decisions and developments that bring the high tech industry into the land use-transportation relationship.

Conversely, negative impact criteria, which can also be expressed as measures, indicators or variables, refer to outcomes to be avoided or minimised. These outcomes include unforeseen costs, problems, disruptions or other nasty surprises that arise when things go wrong, and can be caused by errors of omission or commission or, in a worst case scenario, both types of error.⁷

Table 2. Criteria Identified in Ottawa Area Planning Documents that Could be Used to Measure and Assess the High tech Industry’s Impact on Ottawa’s Land Use-Transportation Relationship.

Positive Impact Assessment Criteria
• Improved safety for transit users
• Improved comfort for transit users
• Improved convenience for transit users
• Improved travel times for transit users
• Improved freedom of movement for transit users
• Increased concentration of work-trip destinations
• Increased dispersion of work-trip destinations
• Increased flexibility of transportation systems
• Increased reliability of land-use forecasts

⁷ For a detailed discussion of impact assessment and performance assessment criteria see Smith and Wellar (1992).

• Increased transit service to areas other than downtown
• Increased transit ridership
• Reduced free parking downtown
• Increased concentration of denser development within the Greenbelt
• Development outside the Greenbelt concentrated in growth areas
• Reduced diversity of trip origins and destinations
• Increased decentralization as telecommunications improve
• Increased protection of residential areas from intrusive through traffic
• Increased employment densities outside downtown
• Stricter land use controls
• Negative Impact Assessment Criteria
• Increased congestion downtown
• Increased driver-only work trips
• Reduced levels of service at arterial intersections
• Increased sprawl
• Increased costs for transit users
• Increased travel times
• Increased costs of vehicle operation
• Increased transportation infrastructure costs

Source: RMO (1972; 1973).

In addition to emphasizing the difference between positive and negative IA criteria, there are three research design features of Table 2 that need to be made explicit. First, the list of normative planning processes, outcomes and instruments used to construct the table is indicative of those contained in the reviewed documents (RMO, 1972, 1973). We believe that an indicative list is appropriate and sufficient for this study, and that a comprehensive listing exercise is one that could be undertaken by the City of Ottawa.

Second, we employ the term **criteria** in the sense that the statements in Table 2 could be cast as variables, which could then be incorporated in analysis/synthesis techniques to measure and assess whether and how well planning goals, objectives, principles or practices that were articulated in the 1970s were achieved through the 1980s and 1990s to the present. Again, this argument is equally applicable for data-based or document-based investigations, with the only significant differences between the studies being in the particular analysis/synthesis techniques employed, and the interpretations of the qualitative, quantitative or visualization outputs arising from the analysis/synthesis procedures.

Third, for reasons of article length and resource constraints, we could not employ all the criteria listed in Table 2 to review the impact assessment intentions or activities of local governments since the early 1970s. As a result, no attempt is made at this stage to achieve exclusivity, or to avoid collinearity, double-counting, etc., in presenting the array of potential variables that could be used.

The next stage in the IA process is to specify the criteria/variables to be used to review local governments' record of assessing the impact of the high tech industry on Ottawa's land use-transportation relationship. Resources permitting, this activity could have been based on a Delphi exercise (see Novakowski, 1999), or it could have been done using the variable selection process designed and tested for the Walking Security Index (Wellar 1997; 1998). However, available resources did not provide the opportunity for pursuing either of those paths, so we opted for the only route open to us. That is, and bearing in mind that this is an exploratory rather than a confirmatory piece of research, we derived the variables to be used by:

- Ensuring their presence in planning documents published by Ottawa area local governments over the duration of the study period.
- Selecting the variables which, based on our knowledge of the Ottawa economy and geography, the high tech industry, and the land use and transportation systems, appeared most likely to be included in local government assessments of the impact of the high tech industry on Ottawa's land use-transportation relationship.

The results of our deliberations are presented in greater detail in Table 3, which contains the criteria initially selected for the impact assessment review. Each criterion is accompanied by an explanatory note of an if-then nature, or as a declarative statement. We hasten to add that since these brief comments are indicative in nature, no attempt is made to achieve one-to-one correspondence between every phrase in Table 3 and every planning document issued by Ottawa area local governments over the past several decades. However, on the basis of multiple readings of entire texts and re-readings of the directly pertinent sections, we submit that the criteria described in Table 3 are overwhelmingly consistent with the intent and content of those documents, and the opinions of those who wrote and approved them.

Table 3. Criteria from the 1972 Regional Transportation Study Initially Selected for Assessing the Impacts of the High Tech Industry on Ottawa’s Land Use- Transportation Relationship.

Positive Impact Criteria	Negative Impact Criteria
P1. Expansion of the transit system. If the transit system is expanded, then demand for road system infrastructure expansion is diminished as fewer private motor vehicles are on roads, which means that fewer vehicles are using parking lots, clogging intersections, obstructing transit vehicles, conflicting with pedestrians and cyclists...	N1. Expansion of the regional road network via widenings, new sections, new bridges, new signals. These initiatives involve increased capital and maintenance costs, loss of land, increased environmental impacts, and invariably lead to more of the same kinds of expansion initiatives elsewhere on the network.
P2. Increased share of work trips by transit. If more work trips are made by transit, then fewer trips are made by car, and air quality is improved, crash/collision levels are reduced, law enforcement costs are reduced...	N2. Increased car-based share of work trips. Increased car-based share of trips means increased consumption of fossil fuels, increased pollution, and increased demand for more roads and widenings (see N1).
P3. Increased usage across the regional road network during peak hour traffic times. If more of the road network is used, then the traffic load at all intersections and on all road sections is diluted, and network expansions are not required.	N3. Increased congestion at intersections and/or along road segments. Increased congestion means increased time spent in vehicular travel (car, truck, bus, bicycle), increased pollution, decreased safety, comfort and convenience of all road users, and increased demands for roadway and/or intersection widenings (see N1).
P4. Better integration of land uses with high trip generation rates and high-capacity transportation services. Better connections between high transportation demand and transportation capacity means fewer mis-matches between demand and supply, and better use of resources.	N4. Increased work-trip travel times. Increased time spent in vehicles means less time for family and non-trip activities, increased demands for more expenditures on roads and/or public transit, and increased pressure to set signal lights to favour car/truck operators and passengers at the expense of transit users, cyclists and pedestrians (see N1).
P5. Better integration of transportation and industrial infrastructure. Tight(er) or more effective linkages between infrastructure components means increased efficiencies and less land used for infrastructure provision.	N5. Increased proportion of land assigned to car-related uses. More land assigned to roads, rights-of-way, driveways and parking lots means less land for residential, institutional, recreational, institutional and ecological uses/purposes, or an outward movement of the urban boundary.
P6. Reduction of critical traffic demands in centrally-located travel corridors. High-level congestion or so-called ‘gridlock’ in some corridors would be significantly reduced if car and/or truck demand is staggered (spread over an extended span of time), or other strategies are employed to deal with the relatively few ‘choke points’ which are allowed to generate network-type impacts.	N6. Localised official plan amendments that distort region-wide land use objectives. Plan amendments that are localised, that is, site-, situation-, or application-specific amendments disrupt the orderly assignment of land uses across the planning area (formerly the Region of Ottawa-Carleton, now the City of Ottawa) with attendant economic, social and/or environmental costs for the city as a whole.
P7. Per capita reduction in public expenditures on transportation system infrastructure. Lower capital costs for roads, bridges, overpasses, transitway segments and stations, equipment, traffic signals, sidewalks, bike paths, etc., mean a reduced tax burden for individuals and businesses, or shifts in budget allocations to more valued public goods and services.	N7. Localised official plan amendments that distort region-wide transportation objectives. Plan amendments that add a lane here, close a roadway there, or move buses from Street A to Street B without regard to their network consequences tend to perpetuate underlying structural or functional problems rather than provide solutions.
P8. Per capita reduction in expenditures on transportation operations. Lower expenditures for servicing and	N8. Localised infrastructure expenditures that distort region-wide development objectives. If a large share of

maintaining roads, transitways, buses, vehicles, paths, etc. mean a reduced tax burden for individuals and businesses, or shifts in budget allocations to more valued public goods and services	Ottawa's budget goes to expanding, maintaining, retrofitting, or re-constructing infrastructure (e.g., sewer and water) in one or two or three locations across the city, then other areas get less and may suffer sewer-related and water-related consequences that have health as well as financial implications.
P9. Per capita reduction in fossil fuel consumption for work-trip purposes. Lower consumption of fossil fuels reduces pollution, ground level ozone or smog, and contributes to improved health of individuals on or along roadways.	N9. Transportation sector expenditures that distort budget allocations. If a larger share of Ottawa's budget is spent on transportation personnel, adding to the road network, constructing sidewalks and curbs, purchasing buses, and developing a light rail system, then a smaller share is available, <i>ceteris paribus</i> , for other items.
P10. Increased number of home-based employees. Increased access to and use of telecommunications systems and services moves data and information instead of people, reduces work trips, increases trip flexibility, lowers demand for roads, reduces congestion at peak hours, reduces pollution,....	N10. Failure to properly maintain road network infrastructure. If Ottawa cannot properly carry out this function, then the network deteriorates, re-construction costs increase, traffic problems arise (see N3), calls for greater road financing arise (see N1, N9), and the city faces liability suits for negligence, lack of due diligence, etc.

Source: RMO (1972).

It follows, therefore, that it is reasonable to expect that these are most likely to be among the criteria/variables included in city or regional government projects or studies assessing the impacts of the high tech industry on Ottawa's land use-transportation relationship.

With respect to the derivation of the criteria, they represent aspects of the impact-relationship connection that are emphasised, highlighted, underlined, criticised, extolled, etc., in numerous Ottawa planning documents over the past 30 years. Further, the criteria can be translated as measures, indicators and variables that define many of the dominant issues, concerns, priorities, principles, 'druthers', exhortations, and schools of thought which have marked the urban land use and transportation planning literature in Canada, the U.S., and abroad for 10, 20, 30, 40, or more years. For those reasons, as well as impressions gained from professional involvement by the authors in land use and transportation matters in the Ottawa region (beginning in the early 1970s in the case of Wellar and the 1990s for Novakowski), the criteria in Table 3 are selected as the foundation set for this study.

To summarise the contents of Table 3, the positive impact criteria refer to outcomes to be pursued or achieved in conjunction with, or as a consequence of decisions and developments that involve bringing the high tech industry into the land use-transportation relationship. And, conversely, negative impact criteria refer to outcomes to be avoided because the costs, disruptions, afflictions, inequities, externalities, or dis-benefits that arise or accrue as a result of the high tech industry's impacts on Ottawa's land use-transportation relationship are deemed to be unwanted, inappropriate, and unacceptable.

A full application of all the criteria in Table 3 in a robust impact assessment review would entail a study that is likely broader in scope, deeper in depth, and more sophisticated in methodology than any land use or transportation study undertaken/funded by the Regional Municipality of Ottawa-Carleton or an associated local government over the past decade. Clearly, such a study is not to be attempted here. Rather, what is appropriate for our paper is to select several criteria to test the efficacy of the document-based IA approach, and to provide a preliminary indication of the extent to which planning documents have regard for the impact of the high tech industry on Ottawa's land use-transportation relationship.

DOCUMENT REVIEW PROCESS

The document review process used a keyword procedure for examining both hard copy and electronic files. This approach increases the likelihood of more quickly identifying relevant statements, while reducing the amount of time and effort required to examine documents. The document search keywords listed in Table 4 include terms from the 1970s and post-1970s local government planning documents, the newspaper articles presented in Table 1, and the learned literature in the fields of high tech, planning, transportation and impact assessment. In view of the exploratory nature of the study, the keyword upper limit was initially set at 18 and then increased to

24, with emphasis on terms that appear to best represent the theme of the paper; that is, examining local governments' record of assessing the impact of the high tech industry on Ottawa's land use-transportation relationship.

Table 4. Terms Used to Search City of Ottawa Official Plan Documents for Statements on Assessing the Impact of the High Tech Industry on Ottawa's Land Use-Transportation System Relationship.

capacity	ecological	industry
cause	ecosystem	integration
cluster	electronics	manufacturing
communication	effect	mitigate
computer	expansion	sprawl
congestion	gridlock	synergism
contraction	impact	tech/nology/nological
decrease	increase	tele/communication(s)

FINDINGS FROM THE DOCUMENT REVIEW

The focus of our examination in the document review is the City of Ottawa's most recent body of official plan documentation, and two reports which appear most relevant to our study:

1. The Official Plan (City of Ottawa, 2003b);
2. The Transportation Master Plan (City of Ottawa, 2003c).

The results of our review are summarised in Table 5. As shown by the string of consecutive **No** entries, it is our finding that not even one of the 20 impact assessment criteria is addressed in the 2003 Official Plan documents that we reviewed. This outcome is so contrary to expectations that it caused us to re-visit the Official Plan materials several times, only to obtain the same result: Table 5 is an accurate account of the total lack of regard given in the Official Plan to addressing the impacts of the high tech industry on Ottawa's land use-transportation relationship.

Table 5. Local Government Regard for the Impact of the High tech Industry on Ottawa's Land Use-Transportation System Relationship: Results from the Review of the 2003 Official Plan.*

Potential Impacts of the High tech Industry on Ottawa's Land Use-Transportation System Relationship: Derived from Review of Early-1970s Documentation**	Impact Addressed in 2003 OP?
Positive Impact Criteria	
P1. Expansion of the transit system.	No
P2. Increased share of work trips by transit.	No
P3. Increased usage across the regional road network during peak hour traffic times.	No
P4. Better integration of land uses with high trip generation rates and high-capacity transportation services.	No
P5. Better integration of transportation and industrial infrastructure.	No
P6. Reduction of critical traffic demands in centrally-located travel corridors.	No
P7. Per capita reduction in public expenditures on transportation infrastructure.	No

P8. Per capita reduction in expenditures on transportation operations.	No
P9. Per capita reduction in fossil fuel consumption for work-trip purposes.	No
P10. Increased number of home-based employees.	No
Negative Impact Criteria	
N1. Expansion of the regional road network via widenings, new sections, new bridges, new signals.	No
N2. Increased car-based share of work trips.	No
N3. Increased congestion at intersections and/or along road segments.	No
N4. Increased work-trip travel times.	No
N5. Increased proportion of land assigned to car-related uses.	No
N6. Localised official plan amendments that distort region-wide land use objectives.	No
N7. Localised official plan amendments that distort region-wide transportation objectives.	No
N8. Localised infrastructure expenditures that distort region-wide development objectives.	No
N9. Transportation sector expenditures that distort budget allocations.	No
N10. Failure to properly maintain road network infrastructure	No

* Reviewed documents include the 2003 Official Plan for the City of Ottawa and the Transportation Master Plan that supports the Official Plan (City of Ottawa, 2003b, 2003c).

** The potential impacts are from Table 3.

In attempting to reconcile expectations and findings, or to understand the reasons for their differences, it is necessary to begin by questioning the study's expectations and research design. They may have been unrealistic or inappropriate to begin with, thereby creating a situation in which it is unlikely or impossible for the findings to 'measure up.' By way of illustration, if the paper's research design involves a matter that is outside the purview of the Official Plan, then it is not reasonable to expect the (impact assessment) matter to be addressed in Plan documentation. As the next several paragraphs demonstrate, there is every reason to believe in the validity of both the study's expectations and its research design.

First, and based on the 1970s planning documents which made an eloquent case more than 30 years ago about the importance of assessing impacts, and the many thousands of associated media items published over the past 30 years (see Table 1 for a selection of indicative articles), it is reasonable to expect that the review of 2003 Official Plan documents would yield numerous directed, substantive statements addressing both the desired impacts and the to-be-avoided impacts of the high tech industry on Ottawa's land use-transportation system relationship. Indeed, we anticipated encountering so many pertinent statements that we explicitly noted in the heading of Table 3 that the assessment criteria represented an initial selection. Following that design decision, we then intended to restrict the number of criteria actually used in the official document review in order to place an upper limit on the size of the paper.

Second, in support of our intention to restrict the number of criteria used in the official documents review, our expectation of finding numerous references on impact-related matters in the 2003 Official Plan was tangibly and virtually reinforced over the course of the study. That is, we were accumulating a large and growing collection of newspaper articles, news releases, and website postings on the City of Ottawa's high tech future, its smart growth summits and conferences, its smart city connections, and its various transportation futures with and without the O-train, more bridges, ring roads, an enlarged Queensway, more dedicated bus lanes, and so on. Moreover, it warrants emphasizing that these materials did not represent just the interests of politicians, citizens, academics, business people and consultants: they also represented the opinions of planners themselves.

It was a reasonable expectation, therefore, beginning with the 1970s planning documents, and continuing through the 1980s and 1990s with a steady flow of local government projects and reports on the high tech industry, that Ottawa's 2003 Official Plan would contain a series of prominent statements explicitly dealing with the impacts of the high tech industry on Ottawa's land use-transportation system relationship. Indeed, based on the volume of newspaper items on this topic week after week for more than 20 years, and the full participation of all groups of people of influence in the public discourse, it was reasonable to expect the 2003 Official Plan to address each impact assessment criterion presented in Table 5.

However, on the basis of what we actually encountered in our review of the 2003 Official Plan, our expectations were sorely misplaced. Instead of finding the rich body of documentation that is needed to justify the claim of being a ‘world class’ city, or even a ‘well-planned’ city, what we discovered is that the City of Ottawa is totally silent on a matter which, on paper, has been of deep and abiding concern to politicians, residents, academics, business people, journalists and planners for 30 years!

As for the validity of the findings of the document review presented in Table 5, we submit that they represent reality to a high degree of accuracy. That is, insofar as we are able to ascertain, the City of Ottawa’s 2003 Official Plan does not use any of the impact assessment criteria in Table 5, nor any other impact assessment criteria which we could identify, in seeking to ensure that Ottawa’s land use–transportation relationship is positively affected by the high tech industry. That being the case, it is logically appropriate to contemplate the following question:

Why is there a major difference between what was expected and what was found regarding the extent to which the Official Plan addresses concerns about the impact of the high tech industry on Ottawa’s land use-transportation relationship?

In terms of explaining the findings contained in Table 5, we were not retained by the City of Ottawa to advise or consult on any aspect of the 2003 official plan process. Consequently, we have no insiders’ knowledge of how it came to pass that regard for the impact of the high tech industry on Ottawa’s land use-transportation system relationship is totally excluded from the 2003 Official Plan. Further, despite many years of involvement in the planning field, numerous local government consulting engagements, and active participation in at least a dozen municipal and regional official plan reviews, we have no outsiders’ explanation for what appears to be a gross error of omission and/or commission by the City of Ottawa in adopting an official plan that makes no mention of the impact of the high tech industry on the land use-transportation relationship.

CONCLUSIONS

The comments in the last section summarise our findings with regard to the paper’s first research objective, which is to ascertain the extent and degree to which local governments in Ottawa-Carleton and later the City of Ottawa had and have regard for the impact of the high tech industry on Ottawa’s land use transportation system relationship. That is, the paper began by presenting a selection of the impact assessment-related statements of the early 1970s, and then it presented dozens of newspaper items selected to represent the many thousands of editorials, columns, letters, reports, etc., that typify the public discourse on impact-related topics over the past 20+ years. However, and despite high expectations that it would be otherwise, Table 5 reveals that the 2003 edition of the City of Ottawa’s Official Plan is silent in terms of its regard for the impact of the high tech industry on Ottawa’s land use-transportation relationship.

As for when and why that shift occurred, and how it came to pass that a topic of deep and broad public discourse is excluded from the Official Plan, those are questions which are beyond the purview of this current investigation. What can be said, however, is that we have no research-based explanation for the difference between what we reasonably expected of the 2003 Official Plan, and what was actually found after intensive keyword-based document searches, and three thorough, page-by-page readings of the documents.

As for the second research objective of employing a document-based approach for impact assessment review purposes, the successful completion of the paper is evidence that historic documents can provide a substantive basis for such a study. In this investigation, we were able to identify several ‘foundation’ documents, develop a framework for tracking a 30-year record and, in the process, make a substantial contribution to IA methodology. That is, we show how both positive and negative impacts can be explicitly incorporated in a local government performance review. And, we also show how a text-based comparative study approach can reduce many hundreds of pages of text to the several critical pages, tables or paragraphs that reveal the extent to which impact assessment methodology is (or is not) employed by local governments in the development and implementation of policy, planning or program objectives.

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