THE TRANSPORTATION IMPACTS OF THREE ALTERNATIVE DOWNTOWN ARENA SITES, WINNIPEG, MANITOBA

BY

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A Practicum
Submitted to the Faculty of Graduate Studies
in Partial Fulfilment of the Requirements
for the Degree of

MASTER OF CITY PLANNING

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Winnipeg, Manitoba

ISBN 0-315-92188-9

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ABSTRACT

This practicum is an investigation of the transportation impacts associated with three alternative downtown Winnipeg arena sites. Arenas are large regional facilities capable of generating a large amount of traffic in a variety of modes. This traffic generating ability requires that the transportation impacts of locating such facilities in a downtown be accurately quantified as significant amounts of traffic have the potential to disrupt other functions within a downtown.

A downtown parking study was developed to determine the parking supply available for arena events. A traffic study using the hockey game as the arena event was developed to ascertain the impacts on the operation of the downtown street system. Downtown public transit services, the enclosed downtown pedestrian walkway network and potential areas of significant event pedestrian traffic were also examined.

Evaluation of the transportation impacts associated with each site determined that the best of the three potential arena sites was located adjacent to the Winnipeg Convention Centre. The operation of surrounding intersections favoured this location. The Lombard Ave. site was rated as the second best site with the Forks arena site rated third. The Lombard Ave. and Forks sites are acceptable in terms of transportation and could be considered if analysis of other planning factors rejects the preferred location adjacent to the Winnipeg Convention Centre.

ACKNOWLEDGEMENTS

I would like to thank my advisor, Professor Geoff Bargh, for his guidance and input throughout this practicum. I would also like to acknowledge Dr. Mary Ellen Tyler for her valuable contributions and Mr. Richard Tebinka, my external reader, for his input and for allowing me the use of his company's facilities. I would also like to acknowledge retired city planning professor Basil Rotoff for his assistance during the early stages of this practicum.

Finally, I want to thank my parents for assisting me with the financial requirements that made completion of this practicum possible.

CHAPTER 1

INTRODUCTION

1.1 Background

During the 1980's, the business of professional sports in North America experienced considerable growth. Broadcast revenues from radio and television increased, and constituted almost half of all revenues generated by the four major professional sports leagues during 1990.[1] The increases in broadcast revenues were followed by escalations in operating costs, primarily due to player salaries. In the early 1980's, athletes earning annual salaries of $1 million were uncommon, but at the conclusion of the decade, salaries in excess of this became standard.

It is expected that during the 1990's, the large national and local television contracts will no longer provide the same level of revenues.[2] Consequently, the owners of franchises in all four professional sports leagues are searching for ways to promote stability and control costs and/or discover new revenue sources.

Promoting stability and controlling costs in professional sports generally involves two procedures. Firstly, revenue sharing is established between teams to ensure that franchises based in smaller communities are not financially disadvantaged with teams based in larger centres. Secondly, a maximum limit on player salaries or "salary caps" for each franchise is

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[1] Anthony Baldo, "Secrets Of The Front Office: What America's Pro Teams Are Worth". Financial World. July 9 1991, p.30

[2] Ibid.

negotiated with the player unions. However, implementation of salary caps contradicts a major objective of a union, that of free agency. Salary restrictions tend to limit player movements.

Faced with the likelihood of diminishing revenues from broadcasting and the difficulties in ensuring financial stability, sports franchise owners are searching for new sources of income. The situation facing professional hockey is probably more acute than those facing the other major professional sports. Similar to other leagues, the National Hockey League (NHL) is faced with the problems of escalating salaries and labour difficulties. However, hockey does not benefit from lucrative U.S. broadcast contracts, and will not likely to do so, until additional markets in the U.S. are captured. The viability and profitability of hockey franchises is more dependent on the revenues generated within a facility than any other major sport.[3] Faced with limited opportunities to expand their revenue base, hockey franchises require improved revenue generating facilities more urgently than other professional sports.

The major new sources of revenues generated within a contemporary facility are derived from the sale of luxury suites and club seating. The additional revenues generated by luxury suites can be substantial. For example, the 130 suites in the proposed new Montreal Forum are expected to generate approximately $11.7 million (Cdn) annually and constitute as much as 25% of the hockey club's revenues.[4] The Palace of Auburn Hills, Michigan, home of the NBA's Detroit Pistons, generates $13 million (U.S.) from its suites.[5] Smaller centres, such as

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[3] David Johnston, "The NHL's Only Shot Is Upstairs," Canadian Business, May 1991, p.44

[4] Ibid., p.45

[5] Anthony Baldo, "Secrets Of The Front Office: What America's Pro Teams Are Worth," Financial World. July 9, 1991, p.36

Canadian cities with professional hockey franchises, are not likely to generate these types of revenues due to smaller local corporate sectors.

Many cities, especially those in the United States, believe that the economic and intangible social values, such as civic pride and status as a "major league" city, associated with professional sports are significant enough to pursue expansion, and to maintain or lure existing franchises.[6] Many rapidly growing cities, particularly those in the southern U.S., often regard the social value of acquiring a major league franchise as more important than purely economic value. For example, the City of Orlando built a 15,000 seat arena for a cost in excess of $100 million (U.S.), when substantially less could have been spent.[7] However, the objective of the city was to acquire a franchise generating civic pride and status as a "major league" city. There are also cities, particularly in the northern U.S., that have been warned by their local franchise owners of a possible team relocation if new, enhanced, revenue generating facilities were not constructed. Many of these cities are experiencing financial difficulties which would probably make excessive public sector spending on facilities less of a possibility, as evidenced by the failure of numerous sports facility referenda. Nonetheless, cities such as Chicago and Cleveland believed that the economic and social benefits of possessing a franchise were sufficiently significant enough to warrant the construction of new facilities.

In Winnipeg, the arena issue exists because the Winnipeg Jets hockey club play in an older facility which cannot generate sufficient revenues to offset increases in operating costs.

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[6] Ibid.

[7] Rob McManamy,"Sports Jobs Soar Despite The Risks",Engineering News Record. July 14,1988, p.60

As a result, the citizens of the City of Winnipeg and Province of Manitoba are faced with deciding whether or not the Winnipeg Jets is economically and socially valuable enough to justify the construction of a new facility, particularly in such difficult economic times.

1.2 Objective

The objective of this practicum is to determine the transportation impacts of three alternative downtown Winnipeg arena locations and to provide recommendations related to the transportation component of a site evaluation process. The practicum focuses on the three major transportation modes associated with downtown arena development, including:

i) automobiles;

ii) pedestrians;

iii) public transit.

1.3 Constraints

There are many potential arena sites, both urban and suburban. Some may be more appropriate than those selected for this practicum. However, this practicum does not attempt to examine the merits and shortcomings of urban versus suburban locations, nor does it pursue an exhaustive investigation of many other locations. The practicum focuses on three downtown sites, two of which have been the most publicised locations for an arena. Both the Winnipeg Convention Centre and Forks sites have been discussed for several years as potential arena locations. Superplex, Snowcap, Manitoba Gardens, and the North American Life Centre are just some of the facilities that have been proposed at either one of the two sites. The Lombard Ave. site is examined as a possible viable downtown alternative to assess how another site would compare with the those more commonly discussed.

This practicum addresses only one aspect of a site evaluation process. Although the issue of transportation is very important when considering the development of large, transport generating facilities in an urban environment, there are other planning issues that must be considered in conjunction with transportation. These include:

i) land use compatibility;

ii) urban design;

iii) displacement of existing activities;

iv) utility servicing;

v) land acquisition;

vi) impacts on historic assets.

1.4 Methodology

This practicum was conducted in the following manner:

A) A review of pertinent literature focusing on the following areas was undertaken to develop familiarity with the topic:

i) the status of professional hockey in Winnipeg;

ii) past arena proposals and studies;

iii) North American downtown arena projects;

iv) transportation planning and traffic engineering.

B) A downtown parking study was conducted to determine the supply of parking available for arena events at each site. Since most arena patrons are expected to arrive in automobiles, determining whether a sufficient amount of parking is available within reasonable walking distances is important. Detailed information on the parking study

can be found in Chapter 4.

C) A traffic study was undertaken for each arena site. Most arena patrons are expected to arrive in automobiles and as a result, this mode represents potentially the most severe impacts on the downtown, thus making a traffic study important for forecasting possible implications. Trip generation, trip distribution, route assignments and downtown traffic circulation pattern projections were each developed, along with an analysis of various downtown intersections. Detailed information on the traffic study can be found in Chapter 4.

D) Information pertaining to the number of downtown and crosstown transit routes, their proximity to each site and future transit facilities was examined. The proximity to existing transit routes and future transit facilities may be an influential factor for determining transit use to arena events. The functioning of the downtown pedestrian walkway system and future walkway additions were examined. Since Winnipeg has a harsh winter climate and with many arena events expected during winter months, providing climate controlled, safe pedestrian access for patrons should be considered. Finally, the potential areas of concentrated event-pedestrian traffic were examined. Since arenas are large regional facilities capable of attracting thousands of people to a downtown, determining the extent of synergies that could be expected amongst various uses is significant in terms of urban revitalization. Also, forecasting areas of pedestrian traffic could provide an indication of how comfortable arena patrons would feel in accessing a site, which may also have serious implications.

E) The transportation impacts of each site were determined and assessed using a qualitative evaluation format. Based on this evaluation, recommendations were developed pertaining to the transportation component of a site evaluation.

CHAPTER 2

THE LOCAL ARENA ISSUE

2.1 Introduction

Chapter 2 examines the status of professional hockey in Winnipeg, the present arena situation, and also reviews past arena proposals and studies to illustrate the evolution of the arena issue in Winnipeg over the last decade.

2.2 Winnipeg Jets Hockey Club

The Winnipeg Jets is one of several franchises in professional sport regarded as a "small market" club. The metropolitan area population of approximately 650,000 makes Winnipeg one of the smallest communities in North America possessing a professional sports franchise. The relatively small size of the local market directly impacts on specific revenue sources. For example, broadcast revenues for the Winnipeg Jets are approximately 50% of the NHL average and the revenues generated from rink advertising are also typically lower.[1] These revenues will probably remain below the NHL average in the future and consequently, Winnipeg is financially disadvantaged in its ability to support professional hockey compared to many larger cities.

The Winnipeg Jets, like other sports franchises, is exploring options for generating new sources of income. The addition of new franchises is one method of generating additional revenues. The Winnipeg Jets have received several million dollars in expansion fees over the

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[1] Lavalin, "Review Of Professional Sporting and Public Assembly Facilities", November 1990, p.1-12,13

last two years resulting from the addition of five new franchises. However, future expansion is limited due to the small number of potential markets remaining, and expansion fees by themselves represent only a short-term solution, since they are typically paid in one instalment. Another potential source of new revenues would be from a major U.S. television network. However, hockey is not recognized as a national sport in the United States as several regions of the country possess only a limited knowledge of the sport, and until such markets are captured, substantial revenues from American broadcasters will not be forthcoming.

In recognition of the improbable expansion of the NHL's overall revenue base, the owners of the Winnipeg Jets have indicated that in order to survive and remain competitive, a new arena, in conjunction with some degree of revenue sharing and salary caps is essential. Revenues derived from the sale of luxury suites and club seats, along with those from concessions and advertising, are the most significant needs of the hockey club.[2] With a new arena, the Winnipeg Jets may be able to absorb increases in player costs for a short duration. However, the long-term viability of the hockey club may be undermined if player salaries are allowed to escalate and/or revenue sharing is ignored. Initiatives undertaken by the NHL hierarchy are also critical for the long term survival of the Winnipeg Jets.

2.3 Current Winnipeg Arena

Presently, the Winnipeg Jets play their home games in a facility which was constructed during the 1950's. In 1979, the arena was expanded to 15,400 seats to facilitate the entry of the Winnipeg Jets into the NHL. The building is one of the oldest in professional hockey. Several of the older arenas, elsewhere, are scheduled for replacement within three years,

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[2] Ibid., p.1-3

leaving the present Winnipeg Arena as one of the few not currently slated for replacement.

The present Winnipeg Arena has a number of design deficiencies that limit revenue generation.[3] For example, there are only approximately 4,000 "first class" seats. Compared with facilities in other cities, this figure is low and consequently, the revenues derived from the sale of such seats are limited. The number, location and quality of existing luxury suites is considered insufficient. The quality and configuration of club seating is regarded as being inadequate and the quantity of premium corner seating is limited due to the encroachment of structural columns.

There are also several shortcomings of the arena from the spectator's perspective.[4] For example, some sideline seats extend beyond the goal line, consequently reducing viewing quality. Upper deck seating is very steep, resulting in a lack of leg room. Several seats are quite narrow, creating an uncomfortable sitting posture and structural intrusions make viewing the scoreboard difficult from the upper deck. Other notable deficiencies include inadequate washroom and concession facilities.

2.4 Why A New Winnipeg Arena?

The present Winnipeg Arena is substandard, from both the spectator's and hockey club's perspectives. It does not generate the revenues necessary for a hockey franchise to remain viable in the 1990's. The facility also fails to provide the amenities spectators desire in return for purchasing expensive tickets.

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[3] Ibid., p.3-17

[4] Ibid.

The preservation of professional hockey in Winnipeg is the primary focus of the arena debate. There are many larger cities in the United States that recognize the economic and social benefits of possessing a sports franchise and are prepared to make dedicated efforts to attract a team, usually by providing a "state-of-the-art" arena. Offers from these cities could easily entice an existing team, such as the Winnipeg Jets, that plays in a dated facility to relocate.

An annual economic impact of $24.3 million is directly attributable to the operation of the Winnipeg Jets.[5] These revenues are derived from such sources as the corporate activities of the hockey club, visiting team expenditures and out-of-province spectators. The overall annual economic impact on Manitoba is in excess of $48 million.[6] The loss of the franchise would undoubtedly deflate the city's morale, result in an economic loss and possibly have negative economic development implications. Local politicians recognize that losing the hockey franchise would give Winnipeg a negative image and be detrimental for promoting Winnipeg as a place to establish businesses.[7] "Plan Winnipeg...towards 2010" states that the arts, entertainment and cultural activities, including the Winnipeg Jets, are influential in economic development.[8] A city the size of Winnipeg is fortunate to possess an internationally recognized sports franchise. A new arena is essential to ensure the long term security of the hockey club in Winnipeg.

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[5] Interim Steering Committee, The Preservation of NHL Hockey in Winnipeg, July 1993, p.11

[6] Ibid.

[7] "Scrambling To Save The Jets",Financial Post, November 4,1991, p.5

[8] Plan Winnipeg...toward 2010, p. 119

2.5 Past Arena Proposals and Studies (1979-1993)

2.5.1 North Portage Arena Proposal

In 1983, a redevelopment proposal for the North Portage area was submitted by the owners of the Winnipeg Jets and Fairweather Properties, a real estate development company. The proposal included a 15,000 seat, $25 million arena as part of a $400 million public-private redevelopment of the North Portage area.[9] Several civic officials, including the mayor, were not supportive of the arena concept primarily due to the several million dollars of public sector money that had been spent four years previously to expand the existing arena. In July 1983, a task force recommended against the downtown arena concept and by September 1983, it had been rejected by the city's Executive Policy Committee.

From the community planning perspective, the downtown proposal had the potential to develop beneficial synergies with the commercial core of downtown Winnipeg. However, this proposal was originated prior to the widespread inclusion of luxury suites and club seating as arena components. Had this project proceeded, the design of the facility may not have been conducive for later undergoing extensive renovations to incorporate luxury suites and club seats. Consequently, Winnipeg today could have had an arena dilemma even with a relatively new facility.

2.5.2 Forks Arena Proposal

In November 1989, a conceptual plan for an arena located northeast of the current Forks development was unveiled. The Forks development is situated southeast of the downtown

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[9] "Arena Issue Remains Snag In Portage Redevelopment",Winnipeg Free Press,Aug 31,1983, p.1,4

Winnipeg core and is bounded by the Canadian National Railway's (CNR) main line and the Red and Assiniboine Rivers and was previously the CNR's East Yards. The arena concept, developed by civic officials, included a 20,000 seat, $100 million facility located on 2.2 hectares of land.[10] The arena was reportedly only one component of an ambitious development plan for the Forks area. Financing for the facility was projected to include about $50 million in private investment, garnered from the sale of concession, advertising and product marketing rights.[11] The remainder of the capital was to be borrowed from the public sector.

The Forks arena concept had several potential shortcomings. Firstly, the proposed financing mechanisms would not have been acceptable to the owners of the Winnipeg Jets. Approximately 50% of the construction cost was envisioned to be capital garnered from the sale of concession, advertising and product marketing rights. The owners of the hockey club have indicated that these revenues are required by them in order to sustain the viability of the franchise. Secondly, the proposed 20,000 seat capacity of the facility would have been excessive, resulting in unnecessary construction and operating costs.

2.5.3 Business Group: Winnipeg Convention Centre Arena Proposal

Another arena concept was developed at approximately the same time as the Forks proposal was unveiled. This concept included a 16,500 seat, $70-75 million arena located on existing surface parking lots immediately south of the Winnipeg Convention Centre.[12] A

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[10] "Norrie Gets CN Land As Arena Site", Winnipeg Free Press, November 16, 1989, p.1,4

[11] "Norrie Eyes Private Arena Funding" Winnipeg Free Press, November 16, 1989, p.21

[12] "Arena Plan Tied To Grants, Tax Breaks", Winnipeg Free Press, June 5, 1990, p.1,4

business group developed the proposal, believing that the Winnipeg Jets required a facility where 100% of all revenues generated within the arena would accrue to the hockey club. Substantial private investment was to be forthcoming if certain conditions were met. Firstly, private investors would purchase the 36% share of the Winnipeg Jets owned by the Winnipeg Enterprises Corporation, a quasi-public corporation that manages the major sports facilities in Winnipeg. Secondly, the group would request $10 million in government grants and the waiving of an estimated annual property tax of $1.5 million. The investors believed that a facility financed exclusively by the private sector was not possible and that significant public contributions were required. Some civic politicians were supportive in providing the waiver and other concessions, while others opposed them.

This proposal would have satisfied the owners of the hockey franchise since all revenues generated within the facility would have accrued to the hockey club. Despite being acceptable to the owners, this proposal would have been politically unacceptable. The public would have no control over facility management or franchise ownership, while currently both the city and province provide the public representation in facility management and team ownership. Significant public contributions for an exclusively private enterprise would have been politically unacceptable and would have kept this project from proceeding.

2.5.4 Multi-plex Proposal

In June 1990, a conceptual proposal known as a multi-plex was unveiled. A multi-plex facility is designed to accommodate a variety of sporting events and exhibitions. The primary design feature that made the proposed facility multi-purpose in function was a system of movable seating. Large seating sections could be moved into a variety of configurations, thus

enabling the facility to accommodate both professional hockey and football. A potential location for the multi-plex facility was not determined. Despite support from the Winnipeg Blue Bombers football club and Winnipeg Enterprises Corporation, the multi-plex concept was not endorsed by the Winnipeg Jets, who insisted that the facility did not provide an intimate hockey environment. Although the multi-plex facility could have been constructed at a cost well below that of separate new structures for professional hockey and football, the hockey club indicated that they would not participate in a multi-plex concept and consequently, the proposal did not proceed.

2.5.5 The Lavalin Study

In 1990, the City of Winnipeg, the Winnipeg Jets hockey club and Winnipeg Enterprises Corporation formed a committee to "review and assess the matter of professional sports and/or public assembly facilities in the City of Winnipeg, to investigate alternatives for the development of new facilities and to examine the report on the economic benefits that could be expected to result from the development of such facilities".[13] A consulting company, Lavalin, was awarded the contract to conduct the study.

In November 1990, a report titled "Review of Professional Sporting and Public Assembly Facilities" was completed. The report included "an independent economic study of the costs, revenues, and impacts associated with the operation of professional sporting and public assembly facilities, the professional sports teams, and other users of those facilities in the City

[13] Lavalin, "Review Of Professional Sporting And Public Assembly Facilities", November 1990, p.1-1

of Winnipeg".[14] Lavalin also evaluated several downtown and suburban sites. The study reached several conclusions including:

i) the need for Winnipeg Jets hockey club to acquire additional revenues generated within a facility;

ii) the present arena suffering from numerous operating deficiencies;

iii) the unsuitability of a multi-plex facility for accommodating both professional hockey and football;

iv) an annual economic impact directly attributed to the operation of the Winnipeg Jets hockey club of $18.7 million;

v) a projected operating profit of $4.4 million for a new arena;

vi) the unlikelihood of the hockey club generating an operating profit in the future under the existing lease.

The Lavalin study recommended that construction of a $94.6 million arena, located adjacent to the Winnipeg Convention Centre, along with a renovated Winnipeg Stadium, were the most appropriate options involving the development of sports facilities. The multi-plex concept was rejected because of a compromised hockey seating arrangement and a financial projection as showing it to be the least cost effective facility option. Renovation of the existing facility was rejected because it was not expected to provide a long term solution for the Winnipeg Jets, nor produce a first class facility.[15] Political reaction to the report was generally favourable regarding the location, although some civic politicians expressed

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[14] Ibid.

[15] Ibid., p.7-3

reservations regarding substantial amounts of local public sector financing.[16]

The report reiterated the long standing beliefs held by the owners of the Winnipeg Jets that a new arena was necessary. However, the study may have suffered from a perceived credibility problem. Since the hockey club was involved in establishing the committee responsible for the study, the report may have been perceived by many as the consultant simply restating the wishes of the hockey club. The lack of political initiative for pursuing the recommendations may have been attributed to this scepticism surrounding the objectivity of the report.

2.5.6 Manitoba Gardens Arena Proposal

In 1991, an arena proposal called Manitoba Gardens was announced for a site adjacent to the Winnipeg Convention Centre. The proposal, developed by the management of the Winnipeg Convention Centre, included an 18,400 seat, $60 million arena equipped with 60 luxury suites, 1,200 club seats and a restaurant.[17] Financing for the facility was projected to include contributions from each of the three levels of government together with private capital generated from the sale of preferred-supplier status to corporations and the pre-selling of luxury suites and club seats.

Reaction to the proposal was mixed. Business organizations, such as the Chamber of Commerce and Winnipeg 2000, approved of the arena concept located adjacent to the

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[16] "Report's Call For Downtown Arena Hailed", Winnipeg Free Press, November 29, 1990, p.17

[17] "Jets Boss Taking Cautious Stand", Winnipeg Free Press, June 1, 1991, p.63,64

Convention Centre. However, concerns were raised by the owners of the Winnipeg Jets. The proposed financing and management of the facility and their impacts on revenues accruing to the hockey club were their primary concerns.

The Manitoba Gardens proposal was similar in many respects to the Forks concept. Significant amounts of private capital, from the pre-selling of luxury suites and club seating, along with the sale of preferred-supplier status, were projected to be raised for facility construction. The use of revenues derived from luxury suites, club seats and concessions to assist construction of the arena would not have been acceptable to the owners of the Winnipeg Jets.

Despite declarations by the Winnipeg Convention Centre administration that significant amounts of the private capital was amassed, the reluctance of both the local and provincial governments to become involved kept the project stalled.[18] By early 1992, the local arena situation took a new direction, and consequently, the Manitoba Gardens project was suspended.

2.5.7 Other Arena Proposals

Several other arena proposals were developed between 1990-1992 that have not received the attention of those previously mentioned. A proposal for expanding and renovating the present Winnipeg Arena had been developed and currently remains the subject of some discussion. Superplex, a concept that included an arena and enclosed football stadium, was proposed for the area north of the Forks. Snowcap, another multi-purpose facility, was also planned for the area north of the Forks. North American Life Assurance Company had also

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[18] "The Clock Is Ticking On Gardens Project", Winnipeg Free Press, August 1, 1991, p.33

developed a modified version of the original Manitoba Gardens concept.

2.5.8 Interim Steering Committee

By the summer of 1991, there was little progress in resolving the local arena situation and some apprehension that the Winnipeg Jets hockey club would be sold and relocated to a city in the United States. Rumours had persisted that offers from American investors to purchase the club had been made. To alleviate these fears, a document entitled "The Preservation of NHL Hockey in Winnipeg" was signed by both the Premier of Manitoba and Mayor of Winnipeg in 1991, ensuring that the Winnipeg Jets hockey club remained in the city until at least 1997. The local and provincial governments agreed to cover all operating losses incurred by the hockey club. A $10 million privately financed management draw was also established, providing the owners of the hockey club with a guaranteed return on their investment.[19]

Measures were then undertaken to investigate a long-term resolution of the arena debate. An interim steering committee was appointed to ascertain the capacity of the City and the Province to support NHL hockey and to determine the optimum physical structure and location for a new facility. In July 1993, the Interim Steering Committee released its report entitled "The Preservation of NHL Hockey in Winnipeg" and came to the following conclusions and recommendations:

i) the operation of the hockey franchise generates an annual economic impact in excess of $48 million, with $24.3 million directly attributable to club operations;

ii) direct, indirect and induced employment attributable to franchise operations is equivalent to between 960 and 1,440 full-time jobs;

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[19] "Complex Arena Deal In The Wings",Winnipeg Free Press, October 26, 1991, p.A1,A2

iii) a new facility, in conjunction with a quality product, professional facility management and revenue sharing and/or salary caps, are essential for sustaining an NHL franchise;

iv) the City and the Province have the capacity to support professional hockey in a first class facility;

v) the preservation of professional hockey along with the interests of the community will be best served by a dedicated, multi-use entertainment centre with a seating capacity not exceeding 17,000;

vi) the optimum site for a new facility is within, or on the edge of, downtown;

vii) the cost of a new 16,600 seat facility would be $111 million;

viii) the financial success of the facility will require:

a) 160 event days in the first full year;

b) an average hockey ticket price of $32.25 in 1996;

c) average attendance of 14,600 per game;

d) professional facility management;

e) successful marketing of premium seating;

ix) public control of the franchise and the facility.

Some of the Committee's recommendations were similar to Lavalin's, such a new downtown arena, equipped with enhanced revenue-generating potential, as being essential for maintaining the financial viability of the Winnipeg Jets hockey club. The private owners of the hockey club would undoubtedly agree with this recommendation, although the Committee further recommended that public control of the franchise and facility were in the best interests of the community.

2.5.9 Current Status Of The Arena Debate

The release of the Interim Steering Committee's report should assist in resolving the local arena debate by no later than June of 1994. The next step in resolving the arena debate lies with local and provincial politicians, and may be dependent upon negotiations between the NHL and the player's union regarding a new collective bargaining agreement. Such crucial factors as potential financing for arena construction and specific site selection have yet to be decided.

CHAPTER 3

PLANNING ISSUES AND CASE STUDIES

3.1 Introduction

Ascertaining the transportation impacts on the downtown core that would occur from the development of a large transport generating facility such as an arena requires a comprehensive understanding of the transportation issues involved. Chapter 3 examines transportation issues and also briefly discusses the various land use issues associated with downtown arena development. An examination of how seven other North American cities have addressed transportation and other planning issues and what can be learned and applied towards Winnipeg's situation from these examples, are also explored.

3.2 Transportation Issues

3.2.1 Vehicular Accessibility

An arena is capable of generating thousands of vehicle trips over a brief period. Traffic destined to and from a facility will not only affect those routes accessing the downtown but more importantly, it may disrupt the efficient operation of the downtown street system itself. In recognition of this, there are a number of issues involving vehicular accessibility that must be addressed.

Downtown intersections must have the capacity to accommodate efficiently arena traffic, along with existing traffic, both prior to, and after, the events. Providing adequate intersection capacities is significant for several reasons. For example, traffic congestion may precipitate

negative repercussions regarding repeat facility visits.[1] Severe congestion may depress arena attendance levels and consequently threaten the economic viability of the facility and also curtail other benefits for the community. Congestion may also discourage visiting a downtown for other purposes, such as shopping, entertainment, or dining, and it may also interfere with vital emergency services, namely fire, ambulance and police services. Finally, there are negative environmental impacts associated with traffic congestion as vehicles that experience excessive intersection delays are less fuel efficient and discharge additional, undesirable emissions into the environment.

Arterial streets offering greater intersections capacities would be the most favourable street systems to utilize when locating an arena downtown. Situating a facility in an area comprised largely or entirely of local and collector streets would not only increase the likelihood of severe congestion but may produce other negative impacts. Local and collector streets are not designed to accommodate large volumes of traffic and often form the framework of a downtown pedestrian network.[2] Providing a favourable pedestrian environment is integral for developing a vibrant and pleasant downtown, and consequently, it is important that the pedestrian environment not be compromised by large volumes of traffic.

In some situations, a potential arena site may require that certain streets be permanently closed, thus affecting downtown traffic patterns to a greater or lesser extent. Depending on the number of street closings, it may be important to undertake a traffic study to determine the

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[1] Andrew Shields and Michael Wright, Arenas: A Planning, Design and Management Guide, (London: The Sports Council, 1989), p.32

[2] Cyril B. Paumier et al., Designing The Successful Downtown, (Washington D.C.: Urban Land Institute, 1988), p.65

impacts on local intersections and surrounding streets, especially during daytime working hours, due to the modifications in traffic patterns. The results of a traffic study could illustrate that the alterations in traffic patterns produce significant impacts and, as such, reduce the suitability of a particular site.

Some potential downtown sites may be located in proximity to residential areas and this could result in traffic generated by a facility infiltrating these areas. Residential areas are not intended for the movement of large volumes of through traffic and would undoubtedly experience a reduction in the quality of their environment. For sites located in close proximity to residential areas, preventative measures such as parking restrictions or other traffic management techniques to prohibit the infiltration by arena traffic, should be considered.

Future additions to the street system and their impacts on arena traffic should also be contemplated. For example, accessibility to a potential arena site may currently suffer from certain traffic engineering deficiencies but could be improved by a bridge, road extension, street widening or other capital projects contained in a transportation plan. Such additions may transform a site from being inadequate to acceptable in terms of vehicular accessibility. Any transportation facilities that are forecast to be developed at approximately the same time as an arena, should be considered. Evaluation of a potential site should not consider proposed long-term infrastructure additions as critical factors, due to the uncertainties in long-range plans.

The effectiveness of transportation management strategies should also be considered. For example, some intersections in a designated study area may be forecast to operate inefficiently

under existing signal and geometric conditions. However, simple traffic engineering measures such as reallocating green times, extending signal cycle lengths, removing curbside parking, non-capital intensive intersection improvements and other measures could significantly improve an intersection's performance. Such improvements could enhance a site's surrounding street system to more adequately accommodate arena traffic.

3.2.2 Parking

Most spectators arriving at arena events will do so in private automobiles, and consequently, this requires that an adequate supply of parking be available to accommodate the demand. Forecasting parking demand requires estimating three specific variables:

i) arena attendance;

ii) modal split;

iii) average vehicular occupancy.

Ascertaining the parking supply would follow demand projections. Ideally, on-site parking would be the most desirable. However, in a downtown environment, providing on-site parking can be very expensive due to land acquisition costs and also represents an inefficient use of land.[3] Off-site parking facilities are most likely to be used in a downtown environment, compelling the need to determine if a potential site has a sufficient parking supply within a reasonable walking distance, typically 10-15 minutes. A deficiency in available parking within a reasonable walking distance may deter individuals from attending arena events.

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[3] Andrew Shields and Michael Wright, Arenas: A Planning, Design and Management Guide, (London: The Sports Council, 1989), p.31

Parking conflicts with other major downtown traffic generators may occur. An arena location may be in proximity to other large traffic generators, such as theatres, concert facilities and shopping centres. In such situations, there could be considerable demand and competition for parking spaces in the immediate vicinity. The competition for spaces could have negative effects by creating frustrating searches for available parking locations and possibly reduce the number of visits to the various facilities.

In some situations, several off-street surface parking spaces may be displaced at a particular site. The short and long-term parking losses should be examined to determine if a parking deficiency occurs. If so, a solution may involve incorporation of an on-site structure. An on-site parking facility could benefit from shared use, thus augmenting its operating efficiency.[4] Monthly and casual parkers (those displaced) along with arena management and major tenants would occupy the facility during working hours while during evenings, arena spectators would use the facility. The high costs involved with the construction of parking structures makes the consideration of shared-use potential a critical factor in developing on-site parking facilities.

Providing some on-site parking, even in situations where significant amounts of surface spaces are not removed, may be considered for two further reasons. Firstly, arena management and major tenants could require on-site parking as they would normally occupy office space within an arena. Secondly, many new arenas today often provide on-site parking for patrons occupying luxury suites and club seats. However, if sufficient supply exists in

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[4] Cyril B. Paumier et al., Designing The Successful Downtown, (Washington D.C: The Urban Land Institute, 1988), p.83

parking structures adjacent to a proposed site to satisfy these demands, additional on-site facilities would not be essential.

Finally, although an on-site parking facility may benefit from shared use, the immediate street system may possess functional attributes that limit the suitability of a large parking structure. For example, the surrounding street system may be largely, or entirely, collector and local streets, thus increasing the potential for traffic congestion generated by a major on-site facility. However, any traffic impacts could be minimized if the surrounding streets possess specific functional attributes.[5] For example, locations along the arterial street network would generally be more appropriate. A traffic study is required if a large, on-site parking facility is contemplated.

3.2.3 Public Transit

Most urban transit systems are structured primarily to serve commuters travelling to the downtown. As a result, a downtown arena location has an opportunity to promote greater use of public transit as an alternative mode of travel.

Determining the available capacity of regularly scheduled transit services approximately one hour prior to, and immediately after arena events and forecasting transit's modal share to arena events would provide an indication of the capabilities of regularly scheduled transit services to accommodate passenger demand. If sufficient available supply can satisfy the projected demand, additional transit vehicles would not be required. In those situations where

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[5] Delcan Engineers and Planners, A Study Of Parking In Downtown Winnipeg, August 1987, p.126

capacity deficiencies along specific travel corridors are expected, consideration could be given to implementing park-and-ride shuttle services from suburban locations to alleviate these shortfalls.

A potential arena site's proximity to major downtown and crosstown transit routes may influence transit use. For example, a location requiring a walking time in excess of 10 minutes from transit routes may dissuade people from using public transit to arena events. The reduction in transit's modal share could produce increases in parking demand, congestion, and emissions, all of which are not conducive for creating a pleasant downtown environment.

In some instances, the parking supply within reasonable walking distances (10-15 minutes) may not be sufficient to accommodate arena parking demand. In such circumstances, implementation of a downtown transit shuttle service could be considered. Although this would involve additional operating costs, shuttle services could provide access to the arena from peripheral parking facilities and simultaneously, assist in traffic dispersion, thereby reducing congestion. The main drawback of downtown shuttle services may involve its acceptability to the public.

Future additions to the regional transit system should be considered to determine what impacts they may have on a particular site to increase the modal share of public transit. For instance, a location that may currently appear undesirable for promoting transit ridership may be situated in proximity to a future regional mass transit station. A site may also be in proximity to a future downtown rail shuttle system which could provide access to remote parking locations, and consequently, promote traffic dispersion. Transit facilities forecast to be

developed at approximately the same time as an arena should be considered. The uncertainties involved with long-range plans makes the consideration of long-term transit facilities less critical.

3.2.4 Pedestrian Accessibility

Several pedestrian accessibility issues are associated with the development of downtown arenas, including the issue of urban revitalization. Arenas and other large regional facilities are large pedestrian traffic generators and offer significant potential for contributing to downtown revitalization.

One of the fundamental principles of urban revitalization is to attract and keep as many people as possible downtown.[6] For the development of market synergies to occur, a diversity of activities and a favourable pedestrian environment between major activity centres is required.[7] Proximity between major downtown anchors is necessary to encourage pedestrian movement and consequently develop synergies. Therefore, maximizing an arena's potential contribution to urban revitalization could be best accomplished by locating the facility in proximity to other major downtown commercial centres, and by doing so, generate pedestrian traffic to the event through these areas.

An arena could also contribute in developing a more favourable downtown pedestrian environment. The presence of vacant lots and large surface parking lots are not conducive for

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[6] Cyril B. Paumier et al., Designing The Successful Downtown, (Washington D.C.: Urban Land Institute, 1988), p.23

[7] Ibid.,p.27

creating an environment that encourages pedestrian movement. If gaps in the urban fabric could be removed through infill development, especially along pedestrian corridors, downtown's perception as a "people place" could be enhanced. Infill development involving a large facility such as arena could make a significant contribution to improving the pedestrian environment.

Safe and convenient access to an arena from various parking locations should be provided for spectators. In certain situations, a potential site may require that spectators walk through poorly lit areas with perceived, or actual, higher rates of crime. Consequently, pedestrian apprehension would be increased and could possibly discourage patrons from attending arena events. Therefore, arena access along well illuminated pedestrian corridors and in safer areas should be available to minimize apprehension.

The presence of grade-separated pedestrian walkways and their potential impacts should not be overlooked. In cities with harsh climates, the use of grade-separated facilities for spectator access is beneficial in providing a climate-controlled, relatively safe form of accessibility. Although such systems may offer benefits, they do have possible drawbacks. For example, pedestrian traffic may be siphoned off from street level to the enclosed systems. In situations where significant amounts of commercial activity exists along the street, the siphoning off of arena pedestrian traffic would reduce the potential for synergy development. However, if grade-separated systems are integrated with major downtown commercial areas, they could increase the possibility for additional economic activities.

3.3 Land Use Planning Issues

Although it is beyond the scope of this practicum, the following are a number of important planning issues that, it is assumed, would have to be addressed in addition to transportation in a comprehensive site selection analysis.

3.3.1 Compatibility

A general principle of land use planning is to ensure that land uses with conflicting activity patterns are isolated from one another.[8] Potential conflicts with other land uses with dissimilar activity characteristics may occur. The most serious friction could develop with predominantly residential areas that experience an influx of large pedestrian and vehicular volumes generated by an arena.

3.3.2 Site Requirements

Minimum site dimensions are required for accommodating an arena's footprint. An arena with a seating capacity of approximately 17,000 would require a footprint of approximately 330 x 450 feet, and in total, consume about 3.4 acres of land.[9] Additional land would be required if parking facilities or other public improvements, such as plazas, are planned on-site.

3.3.3 Scale

Any new, large scale, downtown development should relate favourably with the street at ground level and with adjacent structures to create visual interest and provide human scale

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[8] Gerald Hodge, Planning Canadian Communities (Toronto: Methuen, 1986), p.158

[9] Lavalin, Review of Professional Sporting and Public Assembly Facilities, November 1990, p.4-3

with the pedestrian.[10] A downtown environment would experience a diminished level of visual coherence, clear organizing structure and functional integration unless structures are designed to relate positively with one another and with street level.[11] Generally, arenas are large, bulky and predominantly windowless facilities. Integration of arenas into a downtown may be difficult, or impossible, in some instances but adherence to proper urban design principles, such as reducing above grade volumes and use of windows at street level, could effectively integrate such large facilities into a downtown environment.

3.3.4 Existing Urban Form

Integration of an arena with the existing urban fabric is another urban design issue requiring attention. Establishing consistency and order with surroundings requires that new developments retain the architectural integrity of their environment through use of compatible building materials and facades.[12] Development setbacks should generally be consistent with those of existing buildings to reinforce a consistent street edge.[13]

3.3.5 Preservation Of Historic Assets

Over the last several years, increasing attention has been focused on the conservation of heritage buildings/areas. This movement is largely in response to the recognition that the overall design of many of these projects should contribute positively to the quality of a

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[10] Cyril B. Paumier et al., Designing The Successful Downtown, (Washington D.C.: Urban Land Institute, 1988), p.23

[11] Ibid., p.97

[12] Ibid., p.52

[13] Ibid., p.105

downtown environment. Evaluation of downtown arena sites therefore should be cognizant of the potential for conflicts involving the removal of historic assets.

3.3.6 Removal of Existing Uses

A potential arena site may consist of different activities, such as residential, commercial, or office activities, and disrupting such activities could have negative consequences. For instance, a retail establishment that has occupied the same location for several years may not wish to relocate for economic reasons. Substantial downtown employment could also be forced to relocate, potentially precipitating undesirable economic and social problems. Relocation to a suburban site could make employment opportunities inaccessible, especially for lower income residents, who are more likely to rely on public transit services that do not provide the same level of service to suburbs.[14] Evaluating downtown arena sites should take cognizance of the implications associated with displacing existing activities.

3.4 North American Downtown Arena Projects

3.4.1 Gateway Project (Cleveland, USA)

Background

The Gateway sports complex is a $362 million (U.S.) project currently being constructed on a 28-acre site in downtown Cleveland, Ohio, approximately a five minute walk from the city's retail and office centre. The project consists of a 42,000 seat open-air baseball stadium, a 21,000 seat arena, and a major on-site parking structure. The stadium and arena are scheduled to open in time for the 1994 baseball and basketball seasons, respectively. Project

[14] Kent Robertson, "The Impact Of Transportation On The Central Business District", Traffic Quarterly, Vol.34, No.4, October 1980, p.534

financing includes contributions from both the public and private sectors, with some of the public funding derived from alcohol and cigarettes taxes.

The Gateway project is expected to attract in excess of two million additional visitors to downtown Cleveland. Several thousand jobs are anticipated to be created by this project and over the next decade, an additional $1 billion (U.S) in economic development is forecast.[15]

Planning Considerations

Cleveland possesses an extensive regional freeway system which provides service throughout the metropolitan area of approximately 2.5 million people and as a result, most Gateway patrons will utilize this system for commuting to and from the facilities. The Gateway site takes advantage of the freeway system, as both the arena and stadium are situated at the south side of downtown Cleveland in close proximity to two major freeways (Figure 1). The location of the Gateway project and its proximity to major freeways may assist in reducing traffic congestion in the concentrated downtown activity area north of the site, thus reducing any negative impacts on the pedestrian environment.

The 28-acre Gateway site had previously contained approximately 3,700 low cost, off-street surface parking spaces. Faced with this substantial parking displacement, the project planners developed strategies for rectifying the problem. The parking demand for arena events can easily be accommodated within a 10 minute walking distance as there are an estimated 13,000 available spaces.[16] Only concurrent events at both the stadium and arena will require

[15] Gateway Economic Development Corporation

[16] DESMAN Associates, The Gateway Development Parking Study, April 1991, p.24

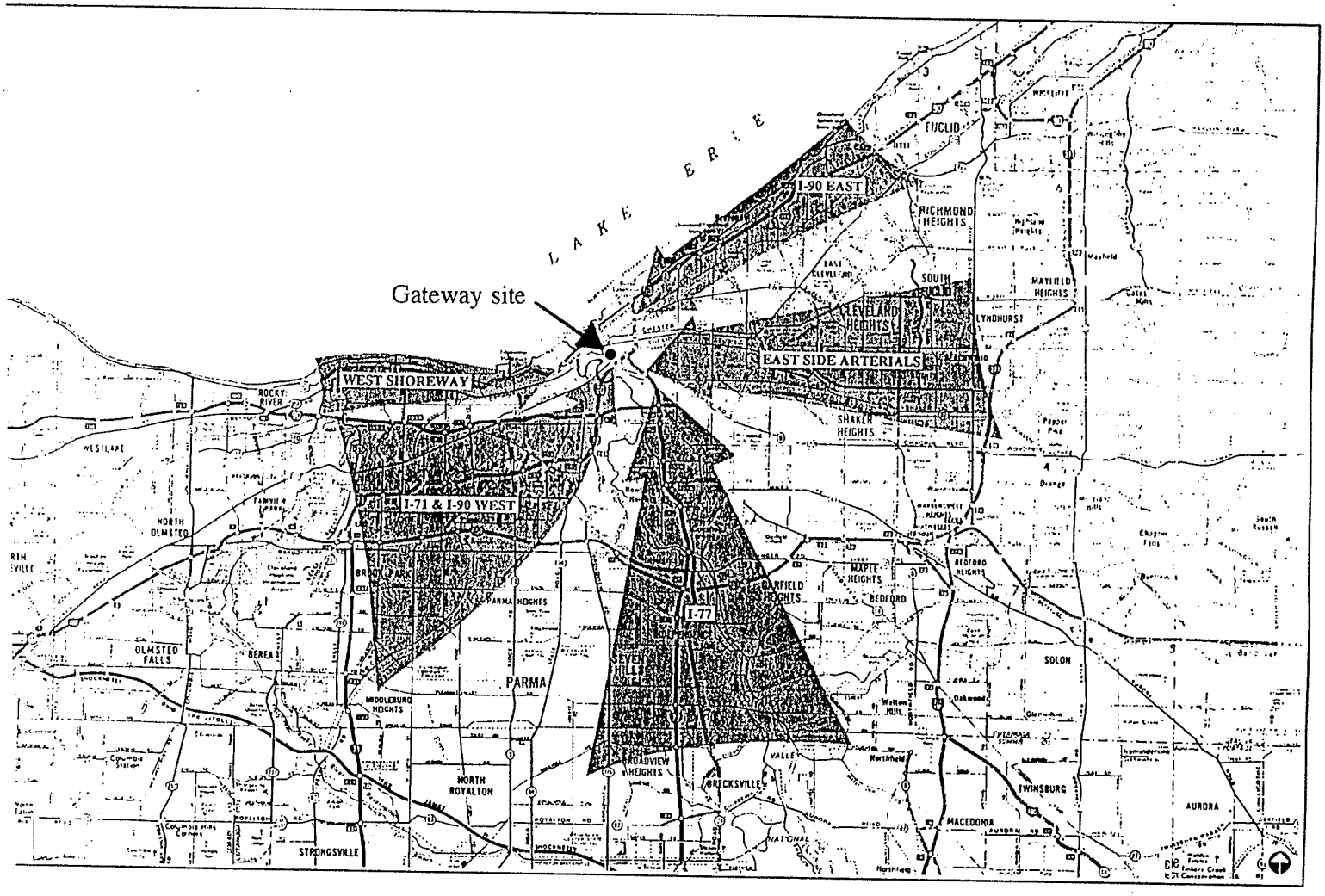

Figure 1. Regional Access Corridors-Gateway Sports Facilities

repared by Sasuki Associates, Inc.

a maximum walking time of approximately 15 minutes from various parking locations. A 3,200 space, on-site parking structure is being constructed to serve clientele occupying luxury suites and other exclusive seating arrangements.

Both heavy and light rail public transit systems serve downtown Cleveland. The Gateway facilities are in close proximity to these systems and as a result, rail transit's potential is enhanced. To increase further the convenience of rail transit, an enclosed pedestrian walkway has been proposed to connect the sports complex with a nearby station.

Although the Gateway facilities are located at the southern edge of the downtown, the project designers have attempted to functionally integrate the facilities with the remainder of the downtown. Designers have taken advantage of the existing street grid, various retail arcades and an absence of surface parking lots to make the complex an integrated component of the downtown fabric.[17] By establishing a pedestrian connection between the Gateway complex and the rest of the downtown, the potential for developing synergies with other uses is increased. The scale of both the arena and stadium are reduced as playing surfaces are below grade and the arena concourse is situated at street level and incorporates windows, therefore allowing the facility to be more sensitive and attractive to the pedestrian environment.

Other uses are planned within the Gateway facilities. A sports bar, a Cleveland Cavaliers merchandise store, food courts and two restaurants are proposed to be integrated into the arena. A baseball museum and a family activities area are also planned.

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[17] Gateway Economic Development Corporation

3.4.2 America West Arena (Phoenix, USA)

Background

The America West Arena is an $89 million (U.S) facility located in downtown Phoenix, Arizona. It is home to the NBA's Phoenix Suns and officially opened during the summer of 1992. It has a seating capacity in excess of 19,000.

A partnership between the Phoenix Suns and the City of Phoenix was established with each group contributing 50% of the facility financing.[18] Public sector financing included increases in hotel/motel bed and car rental taxes. The 40-year partnership has the city as facility owner and the Suns as facility manager. It is expected that the arena will attract in excess of an additional two million people to downtown Phoenix.

Planning Considerations

Regional access to the America West Arena is provided by the local freeway system, serving the metropolitan area of approximately 2.0 million people. Downtown Phoenix is situated within a freeway collection and distribution loop that allows for regional traffic to distribute itself to the most convenient route for accessing the downtown.[19] The arena and its parking area are situated within a grid of one-way arterials, offering very good intersection capacities and favourable signal progressions (Figure 2). A major one-way couplet, situated immediately north of the site, provides good connections to the city's freeway system. Phoenix does not possess an extensive regional rail mass transit system. In recognition of this and the size of the metropolitan region, transit's potential as a significant mode would appear

[18] America West Arena

[19] Kracor Inc., Downtown Arena Parking-Traffic Analysis Study, 1988, p.30

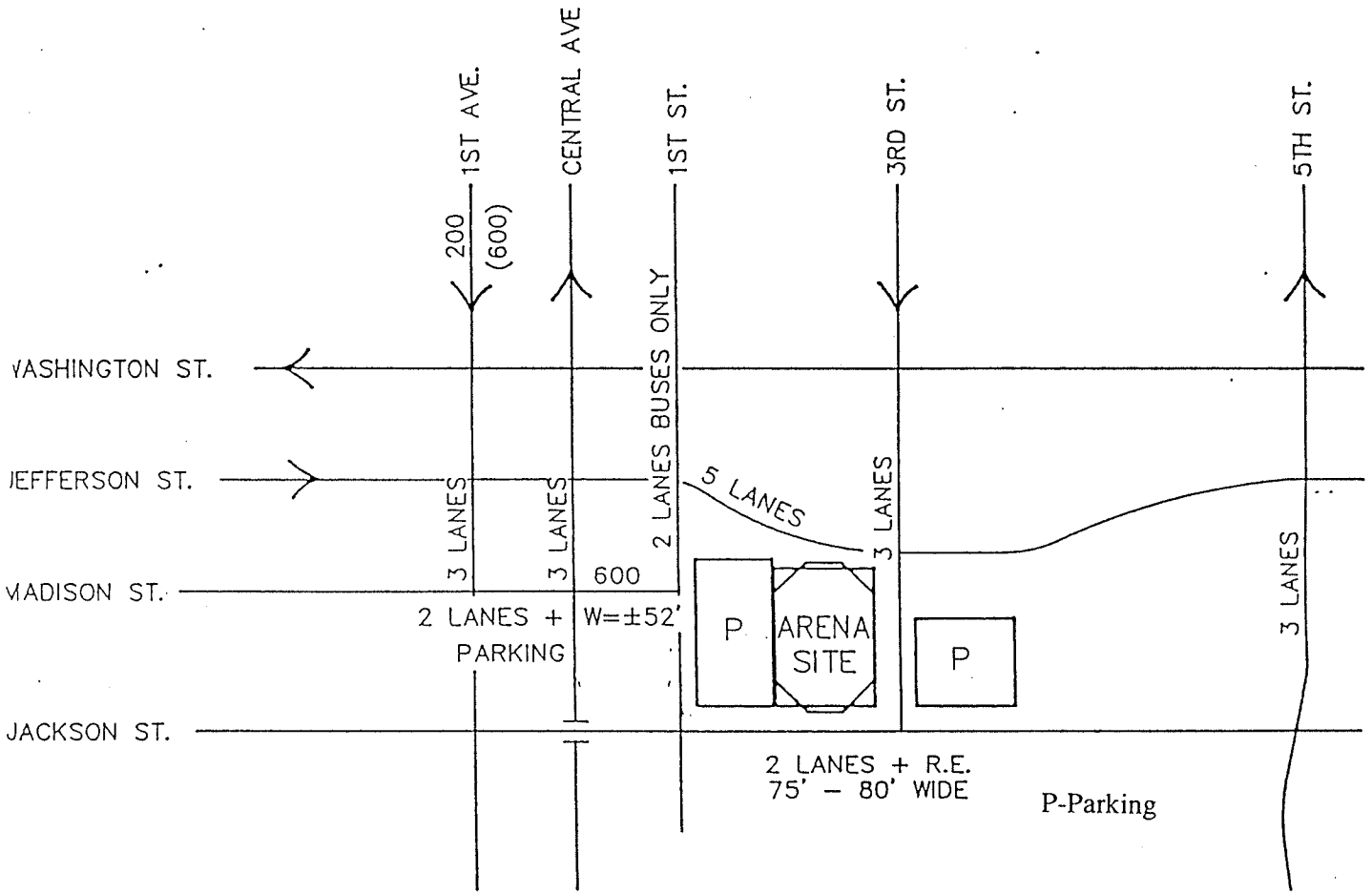

Figure 2. Downtown Phoenix: Surrounding Street System-America West Arena

(Source: Kracor Inc.)

to be minimal.

Parking for "sold-out" arena events can be accommodated within an eight minute walk, or approximately 2,000 feet from the arena.[20] There are an estimated 6,000 off-street spaces available within 2,000 feet of the facility. The 11-acre arena site includes an 891 space, multi-level facility that provides parking for luxury suite patrons. There is a second structure located across the street providing 1,500 spaces.

Phoenix's convention centre is located diagonally across from the arena. The arena, in conjunction with the convention centre, creates a considerable amount of floor space and flexibility for exhibitions, conferences and conventions. To make the America West Arena site a more pleasant "people place", designers have included an on-site plaza featuring an attractive fountain, park seating and landscaping.

The America West Arena also includes ancillary commercial uses. Within the facility is a 12,000 square foot food court that not only serves event patrons, but also remains open for the downtown business community during weekdays.

3.4.3 Target Centre (Minneapolis, USA)

Background

The Target Centre arena is located on the west side of downtown Minneapolis. The facility was constructed for the NBA's Minnesota Timberwolves, who entered the NBA as an expansion franchise in 1989. The Target Centre opened during the 1990-91 basketball season

[20] America West Arena

and has a seating capacity of approximately 19,000. Arena financing primarily involved private capital along with smaller public contributions.

Planning Considerations

Downtown Minneapolis can be accessed using an extensive metropolitan freeway system, providing excellent regional vehicular access for the metropolitan area of approximately 2.5 million people. The Target Centre itself is situated within a grid of one-way arterials, with a major north-south couplet located immediately east of the arena. The presence of one-way streets allows for greater intersection capacities and more favourable signal progressions, consequently promoting better traffic distribution into and out of the downtown.

There is ample parking supply in downtown Minneapolis for Target Centre events, with an excess of 15,000 parking spaces within four blocks of the arena.[21] Located immediately west of the Target Centre are three large parking structures. These parking structures are components of an integrated transportation system that promotes carpooling and transit along a freeway serving the western region of the Twin Cities. There are approximately 6,000 spaces in these garages, all of which are within three blocks of the arena and are anticipated to be connected to the Target Centre by the enclosed pedestrian walkway system, in 1993.[22] Spectators arriving from the western suburbs of Minneapolis who wish to access these garages can do so without infiltrating the downtown area. The location of these structures is favourable for assisting in reducing traffic congestion in the downtown.

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[21] Target Centre

[22] Jim Daire, City of Minneapolis Planning Department

The Target Centre is situated on two city blocks that were formerly occupied by warehouse buildings, surface parking lots and several small commercial buildings. Located adjacent to the arena is the North Loop Warehouse Local Heritage Preservation District. The Butler Square Building, a former warehouse renovated for office and retail uses, is located immediately across the street from the arena and has been designated a local heritage preservation site. In recognition of the historic significance of the surrounding area, the architects designed the arena to complement its surroundings by ensuring that the scale of the facility was comparable to adjacent buildings. The arena's height and its strong orientation to the street are two features that were designed to integrate the facility with its surroundings.[23] The Target Centre is expected to be connected to the remainder of the downtown area via "skywalk" connections that are scheduled to open in 1993, providing a climate-controlled pedestrian link to other major downtown activity centres. Figure 3 illustrates the downtown Minneapolis skywalk system.

Other uses are also included within the Target Centre. Occupying two levels below the arena is a major fitness facility called The Arena Club, approximately 160,000 square feet in size. The fitness club includes running tracks, basketball courts, swimming pools, a weight centre, raquetball, handball and squash courts, among others. There is also a restaurant located within the arena.

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[23] Ibid.

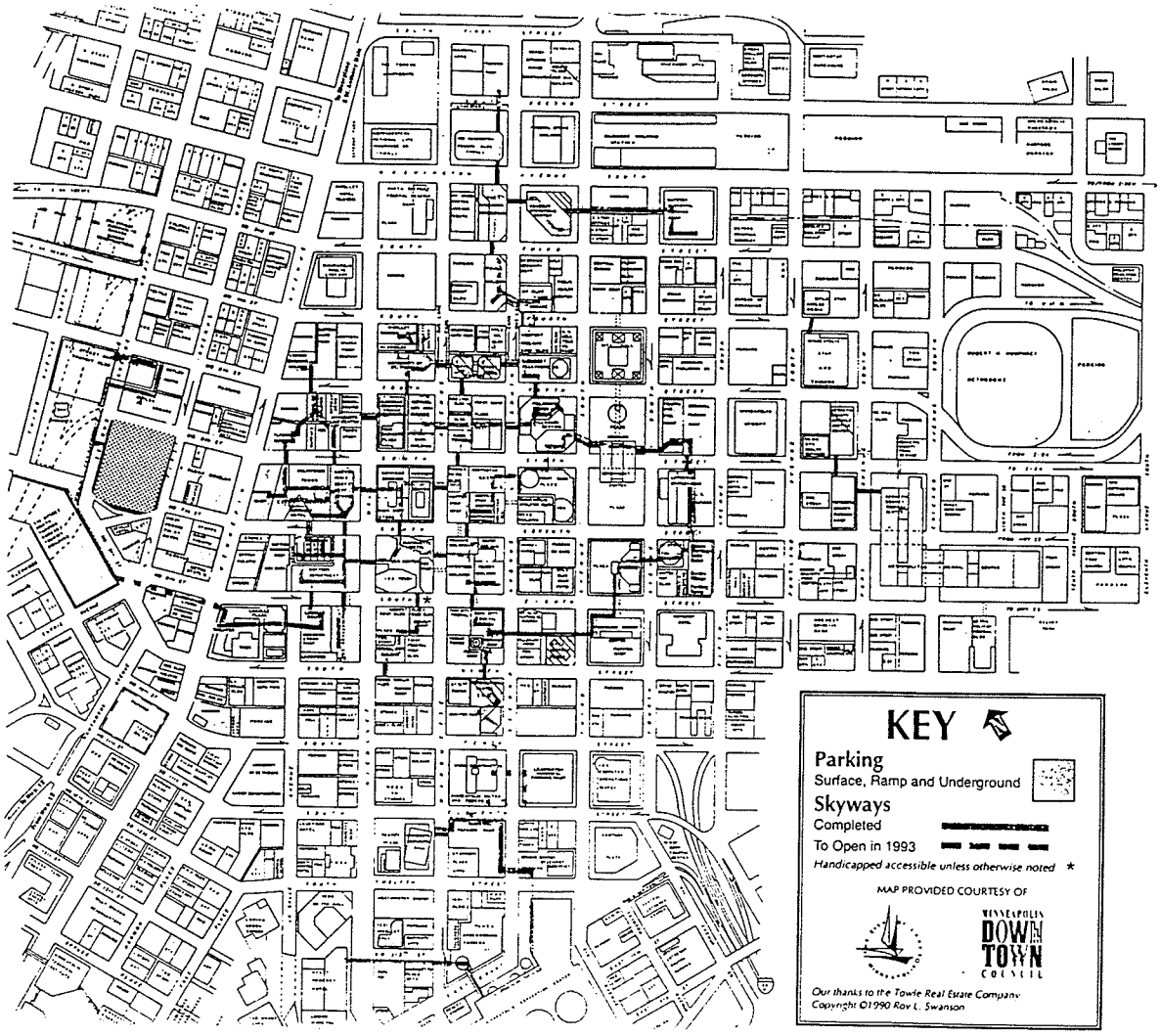

Figure 3. Downtown Skywalk System-Minneapolis Arena

3.4.4 Miami Arena (Miami, USA)

Background

The Miami Arena is a 16,000 seat facility located at the northern edge of downtown Miami, Florida and is home to the NBA's Miami Heat and NHL's Florida Panthers. The $53 million (U.S.) facility opened during the 1988-89 basketball season and was part of a $1 billion urban renewal program for downtown Miami. It is located approximately six blocks from the official centre of Miami.

Planning Considerations

Regional access to downtown Miami is provided by the area's extensive freeway system, serving a metropolitan area of approximately 3.5 million people. Major freeways are located to the north and west of the arena and some spectator access to the site and corresponding parking facilities can be accomplished without travelling through the entire downtown. The arena's northern location relative to downtown and the location of the freeway system is favourable for reducing the impacts of event-generated vehicle traffic on the concentrated downtown activity area south and east of the arena. In the arena vicinity, a grid of one and two-way streets facilitates vehicular movement. Figure 4 illustrates the various transportation facilities serving downtown Miami.

There are in excess of 4,500 parking spaces within 750 feet of the arena site.[24] In addition, there are over 15,000 spaces throughout downtown Miami. The arena's parking demand can easily be accommodated within reasonable walking distances.

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[24] Miami Arena

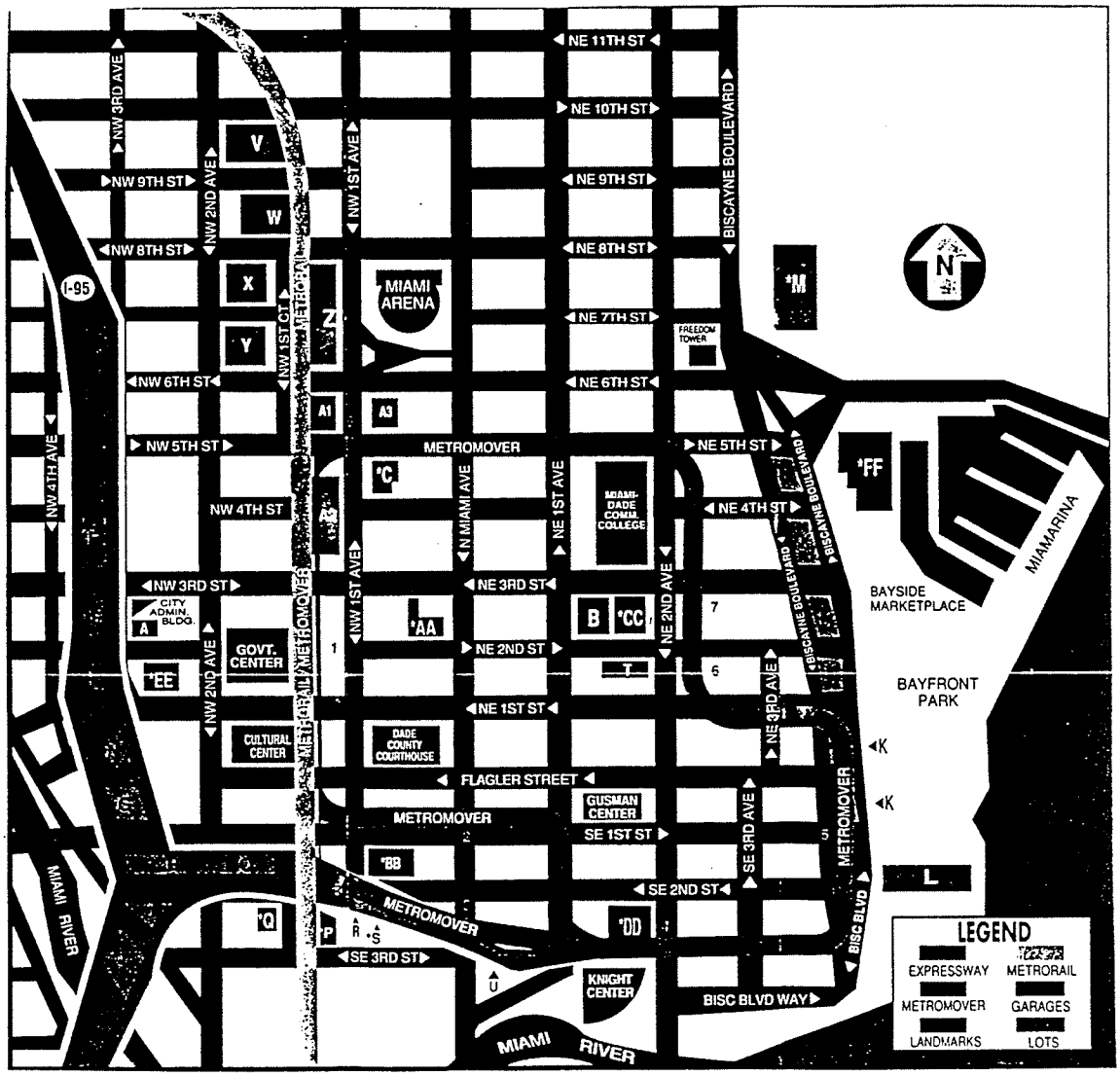

Figure 4. Transportation Facilities-Downtown Miami
(Source: Miami Parking System)

One of the more innovative transportation planning issues addressed by the Miami Arena involves public transit. The Miami metropolitan area contains an extensive light-rail mass transit system called Metrorail. The Metrorail line passes through downtown Miami with one of its commuter stations located approximately 150 feet from the arena.[25] The proximity of the station makes the arena easily accessible for those spectators residing in Metrorail service areas. Downtown Miami also includes a rail shuttle service called Metromover, forming a loop around the downtown. A Metromover station is situated in close proximity to the arena, allowing arena patrons the option of parking in remote downtown facilities and to arrive at the arena using this system. Utilization of the Metromover system may allow for greater traffic dispersion in the downtown, and consequently, reduce the impacts of arena generated traffic.

The area surrounding the Miami Arena has a reputation for significant criminal activities. The arena's location at the northern edge of the downtown somewhat isolates the facility from the downtown core to the south and the waterfront area to the east. In all likelihood, any positive economic impacts generated by the facility are minimal. Unlike some other new facilities opened in the last five years, the Miami Arena does not include any commercial ancillary uses. The relatively low construction cost and distance from other major downtown activity centres are the factors most likely responsible.

3.4.5 Orlando Arena (Orlando, USA)

Background

The Orlando Arena is a 15,000 seat facility located in downtown Orlando, Florida. Its primary tenant is the NBA's Orlando Magic and it is a component of the Orlando Centroplex,

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[25] Ibid.

a development which also includes a performing arts centre, conference centre, hotel and a recreation centre.

Planning Considerations

Regional accessibility to the Orlando Arena is provided by a freeway located east of the arena and major arterials located north and south of the site, which serve the metropolitan area of approximately 1.5 million people. The arena and other Centroplex facilities are situated adjacent to a number of streets including collectors, arterials (one and two way) and a freeway. The collectors in the area are generally two or four lanes and typically are not designed to accommodate heavy traffic volumes. In recognition of this, a traffic management plan has been developed to mitigate the traffic congestion generated by arena events.[26] The three stage plan involves closing certain streets to through traffic and directing vehicles to specific on-site parking facilities based on their approach route and also directing traffic to specific off-site facilities whenever on-site parking is fully occupied. Figure 5 illustrates the surrounding streets and on-site parking facilities for the Orlando Arena.

There are approximately 4,200 on-site parking spaces, which can accommodate most spectators for sold-out Orlando Arena events.[27] The overall parking demand for sold-out events cannot be accommodated on-site and consequently, the traffic management plan incorporates the use of remote parking facilities whenever on-site spaces are fully occupied. Spectators parking in remote locations can use a free shuttle bus service to access the arena from these locations. There are approximately 7,100 parking spaces within a four block radius

[26] City of Orlando Transportation Planning Bureau

[27] Orlando Centroplex

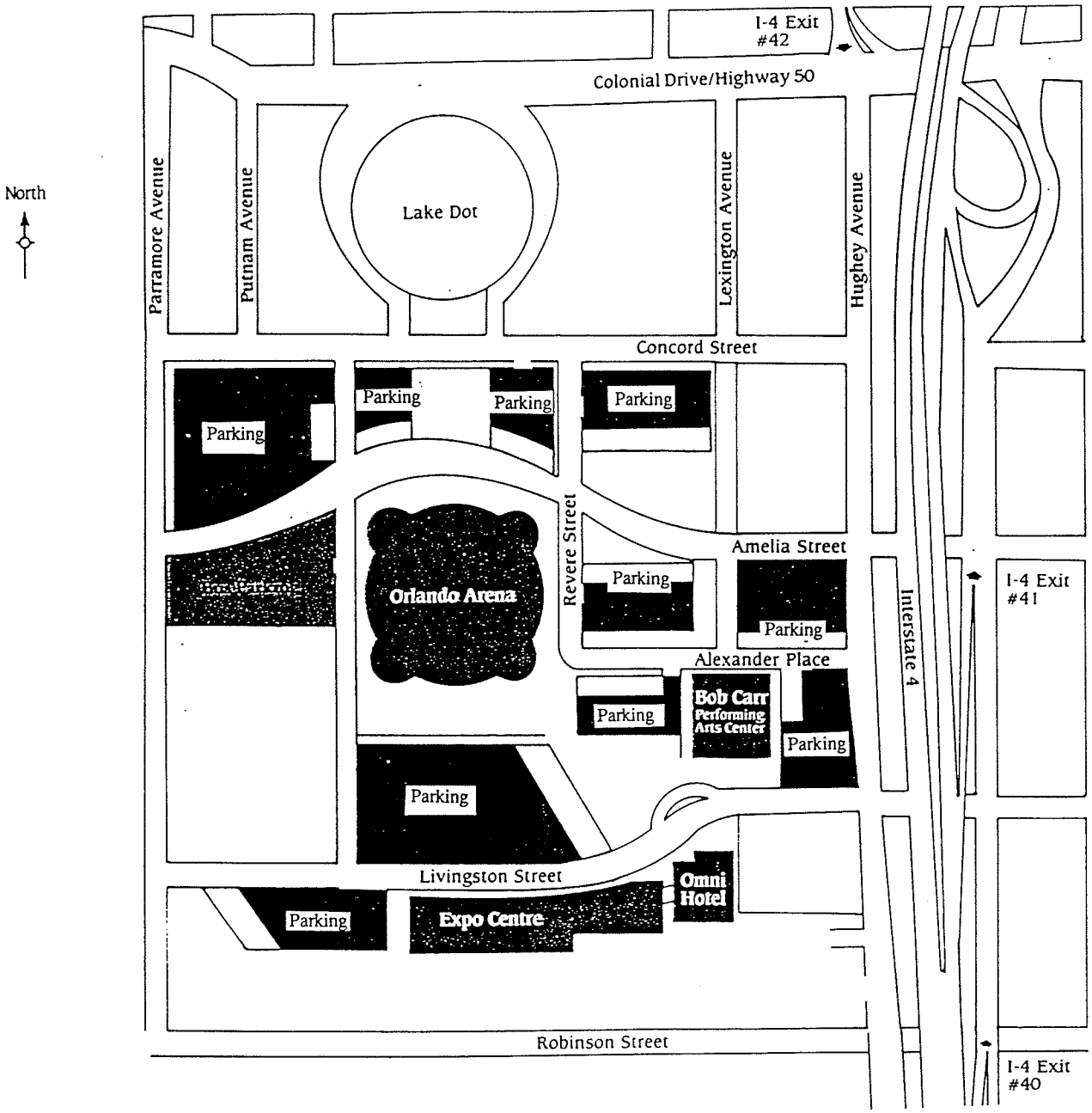


Figure 5. On-site Parking Facilities and Surrounding Streets-Orlando Arena (Source: Orlando Centroplex)

of the arena.

The Orlando Centroplex is located in what was previously perceived a less safe area. However, much of the area was purchased and developed with green spaces and other landscaping improvements, creating a more pleasant environment for arena patrons. The Orlando Arena does not include ancillary commercial functions that can be used during non-event periods. The facility's location on the edge of the downtown may be the responsible factor.

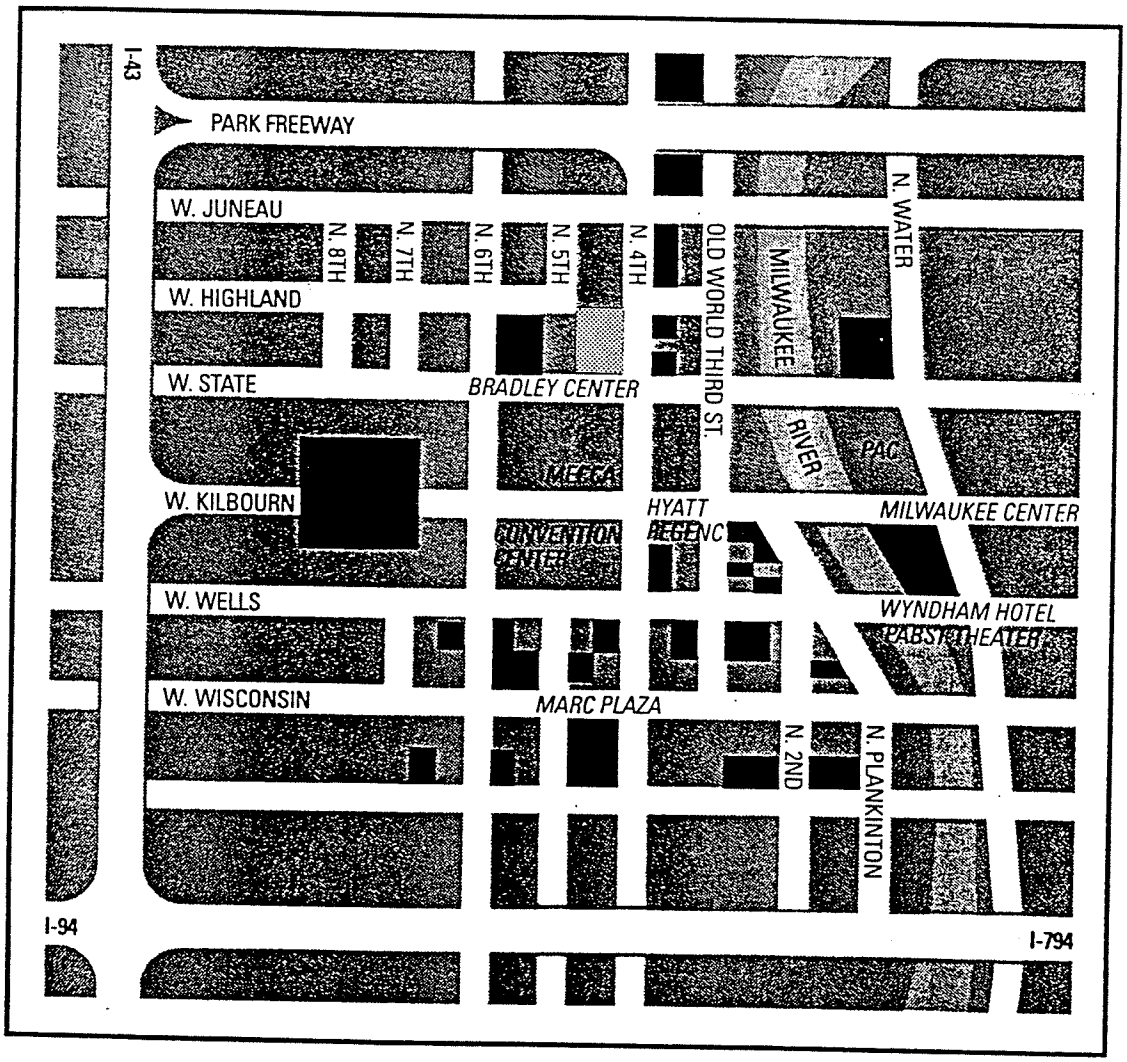
3.4.6 Bradley Centre (Milwaukee, USA)

Background

The Bradley Centre is an 18,000 seat arena located in the western section of downtown Milwaukee, Wisconsin. The arena is the home of the Milwaukee Bucks of the NBA and opened in 1988. The Bradley Centre replaced the older, smaller Mecca Arena, located across the street. Arena financing consisted primarily of private capital although some public contributions were made.

Planning Considerations

Regional access to downtown Milwaukee is provided by two major freeways, one operating north-south and the other east-west, with both located within a few blocks south and west of the Bradley Centre. Much of the metropolitan area, with a population of approximately 1.5 million, is served by these freeways and as a result, regional vehicular accessibility is good. Figure 6 illustrates the surrounding streets and parking locations for the Bradley Centre.



PARKING

Arena

Figure 6. Parking Locations and Surrounding Streets-Bradley Centre

(Source: Bradley Centre Corporation)

Parking demand for Bradley Centre events can be accommodated within five blocks of the site as there are approximately 15,000 spaces.[28] The Bradley Centre site was formerly a 550 space surface parking lot. As a result of this parking displacement, a program was developed to replace these spaces and provide additional parking within two blocks of the Bradley Centre to accommodate the additional demand generated by the arena.

The Bradley Centre is situated within a historic area. The arena is located in the Old World Third Street District with its east atrium lobby overlooking Milwaukee's riverwalk, a park, theatre district and other historic buildings.[29] Integration into this historic area has been accomplished using good planning and design principles, compatible with the area's sensitivity. The proximity of the Bradley Centre to the convention centre and the Mecca Arena, all located within two blocks of one other, offers considerable floor space and flexibility that can be used for convention and exhibitions purposes. The Bradley Centre does not include any ancillary commercial activities for public use on a daily basis.

3.4.7 Copps Coliseum (Hamilton, Ontario)

Background

The Copps Coliseum is an 18,000 seat facility located in downtown Hamilton, Ontario. The arena opened in 1985 and was built at a cost of $43 million (Cdn) using public financing. The coliseum is the major component in the city's extensive $250 million downtown redevelopment program. It has hosted numerous major events, although it currently lacks a major league sports franchise.

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[28] Bradley Centre Corporation

[29] Ibid.

Planning Considerations

Hamilton is one of the smallest cities in North America, with a metropolitan area population of approximately 600,000, that includes a downtown facility the size of the Copps Coliseum. Since smaller urban areas tend to have lower downtown parking accommodations, satisfying the demand generated by major arena events could have been difficult. However, the Copps Coliseum is located virtually in the centre of downtown Hamilton, thereby providing reasonable proximity to most major parking areas. Parking demand for most arena events can be accommodated within a 10 minute walk, although sell-outs or near sell-outs may require walking times up to 15 minutes.[30] Regional accessibility to downtown Hamilton is provided by arterials since Hamilton does not have an extensive freeway network. Copps Coliseum and its parking areas are situated within a traditional downtown street grid.

The arena is located is close proximity to the Hamilton Convention Centre and the Hamilton Place Theatre, which together provide Hamilton with a substantial amount of floor space and flexibility that can be used for conferences, exhibitions, and conventions. The arena is connected to Lloyd D. Jackson Square, a major retail and office complex in downtown Hamilton with approximately 540,000 square feet of retail space. The arena's proximity to major commercial centres increases the potential for developing synergies. The Copps facility also includes 33,000 square feet of retail space, which can be used daily by the downtown working population.

3.4.8 Case Study Conclusions

Several lessons can be learned from these other downtown arena projects. First of all,

[30] City of Hamilton Traffic Department

although most cities rely on freeways to provide regional accessibility, their absence does not imply that a downtown location should not be considered. For example, Hamilton is very comparable to Winnipeg in terms of size and transportation facilities and it possesses a downtown facility. The absence of freeways places emphasis on regional arterials serving the downtown to provide the capacity for accommodating event traffic.

Most of the cities rely on arterial streets for accommodating event traffic. In recognition of this, a downtown arena site in Winnipeg should follow these examples. The use of collector and local streets does occur, as evidenced by the Orlando example. To cope with the limitations of the surrounding street system, Orlando has developed a traffic management plan. In Winnipeg, limited use of collector and local streets can occur but extensive reliance on them could require a somewhat complex traffic management program, which could generate additional negative traffic repercussions.

In most cities, sufficient parking supply is available within a 10 minute walking time to accommodate arena patrons. Taking into consideration Winnipeg's climate, providing a sufficient supply within a 10 minute walk of an arena is important. Also, several newer arenas, such as those in Cleveland and Phoenix, are offering on-site parking for luxury suite patrons, an option which should be considered in Winnipeg, providing a significant shared use potential is available.

In terms of pedestrian access, Minneapolis, which has a similar climate to that of Winnipeg's, has planned to integrate the Target Centre into an enclosed pedestrian walkway network. Downtown Winnipeg also possesses a pedestrian walkway system and consideration

could be given to integrating an arena into it. Several cities, such as Cleveland, Minneapolis, and Hamilton have arenas located within reasonable walking distances of other major downtown activity centres, thus increasing the vitality of their downtowns, a planning issue which should be considered in Winnipeg.

Some cities, such as Cleveland and Miami, possess rail mass transit systems and have arenas located within reasonable walking distances of stations, thus encouraging the use of transit to arena events. Although Winnipeg currently lacks rail transit and rapid transit busways, it should consider sites situated in proximity to future facilities in order to enhance the desirability of transit, providing these facilities are forecast to be developed within the foreseeable future.

Finally, both Milwaukee and Minneapolis have arenas located either within, or adjacent to, historic areas. As a result, these two examples can serve as precedents for Winnipeg if consideration is given to locating an arena within or near the Exchange District. As long as proper architectural and urban design treatments are applied to complement and respect the sensitivity of the historic buildings in the area, the Exchange District could be a viable location for a downtown arena.

CHAPTER 4

PARKING/TRAFFIC STUDY METHODOLOGY

4.1 Introduction

A major trip generator such as an arena will attract patron trips in several modes. However, experience has concluded that the automobile is expected to be the most dominant mode of patron travel and presents the greatest potential impact on the downtown environment. Chapter 4 describes the development of a downtown Winnipeg parking study, along with vehicular traffic projections, ranging from trip generation to downtown intersection analyses.

4.2 Downtown Parking Study

A downtown parking study was undertaken to determine the available supply for arena patrons. The study was conducted in the following manner:

A) A 10 minute walking zone from the arena was established for each site. It was assumed that this time was representative of the maximum acceptable walking limit for arena patrons. Figures 7-9 illustrate each parking zone and the major parking facilities (along with structure facility capacities) within them.

B) Information on the overall parking supply in downtown Winnipeg was acquired from the City of Winnipeg Streets and Transportation Department. This information supplied data on the quantity of commercial and residential spaces on an individual block basis. For the purposes of this study, residential spaces were excluded. Blocks

constituting each parking zone were identified.[1] Block locations and their overall parking supplies are provided in Appendix 1.

C) The overall commercial parking supply for each block was adjusted, involving reductions to provide more accurate indications on the potential number of spaces available for arena patrons. Parking off of alleys and customer parking facilities, usually restaurants, were identified and deducted from the commercial parking supply. It was assumed that private lots used for employee parking during daytime hours would be made available for arena events.

D) The available parking supply of each applicable block was estimated. Surveys were conducted during Friday evenings between 6:30-7:30 P.M. Friday evening was selected because the largest attendance for hockey games typically occurs on Fridays and weekends, which would generate a higher parking demand. It was also assumed that Friday evenings would generate greater downtown shopping and recreational activities than weekends or other weekday evenings, consequently reducing the number of available spaces for hockey games or other arena events. The selection of the 6:30-7:30 P.M. period was reflective of the peak hour of arrival. The survey was performed during November 1992 and January 1993. The omission of December 1992 was to avoid any conflicts that may have arisen with the Christmas shopping season.

The available parking supply for each block was determined by surveying individual

[1] For the Convention Centre and Forks sites, certain blocks were not included in the parking study. It was assumed that parking restrictions would be enforced in these areas during arena events.

lots or structures. It was assumed that an individual facility was representative of the entire block. The capacities of individual parking facilities were obtained from a parking map provided by the City of Winnipeg Planning Department and used to determine the percentage of spaces available. The majority of blocks were surveyed and for those omitted, estimates of their availabilities were determined using results from adjacent blocks. The number of spaces available in each block was determined by multiplying the parking availability percentage of a particular facility to the block's adjusted potential supply. The availability of on-street parking was not determined since it was assumed that few on-street spaces would be available during arrival periods and that transportation management strategies may eliminate some on-street spaces.

E) For traffic analysis purposes, a further reduction in the available parking supply reflecting the estimated 15% of arena patrons in the downtown prior to the peak hour of arrival, was incorporated. Based on attendance, modal split and vehicle occupancy estimates, 15% of arena patrons were projected to occupy 720 spaces. It was assumed that these 720 spaces were occupied throughout most of the downtown and that this figure constituted approximately 4% of the potential downtown parking supply. For each block, the available parking supply was reduced by 4%. The available parking supplies for each site are summarized in Tables 11-13 of Appendix 1.

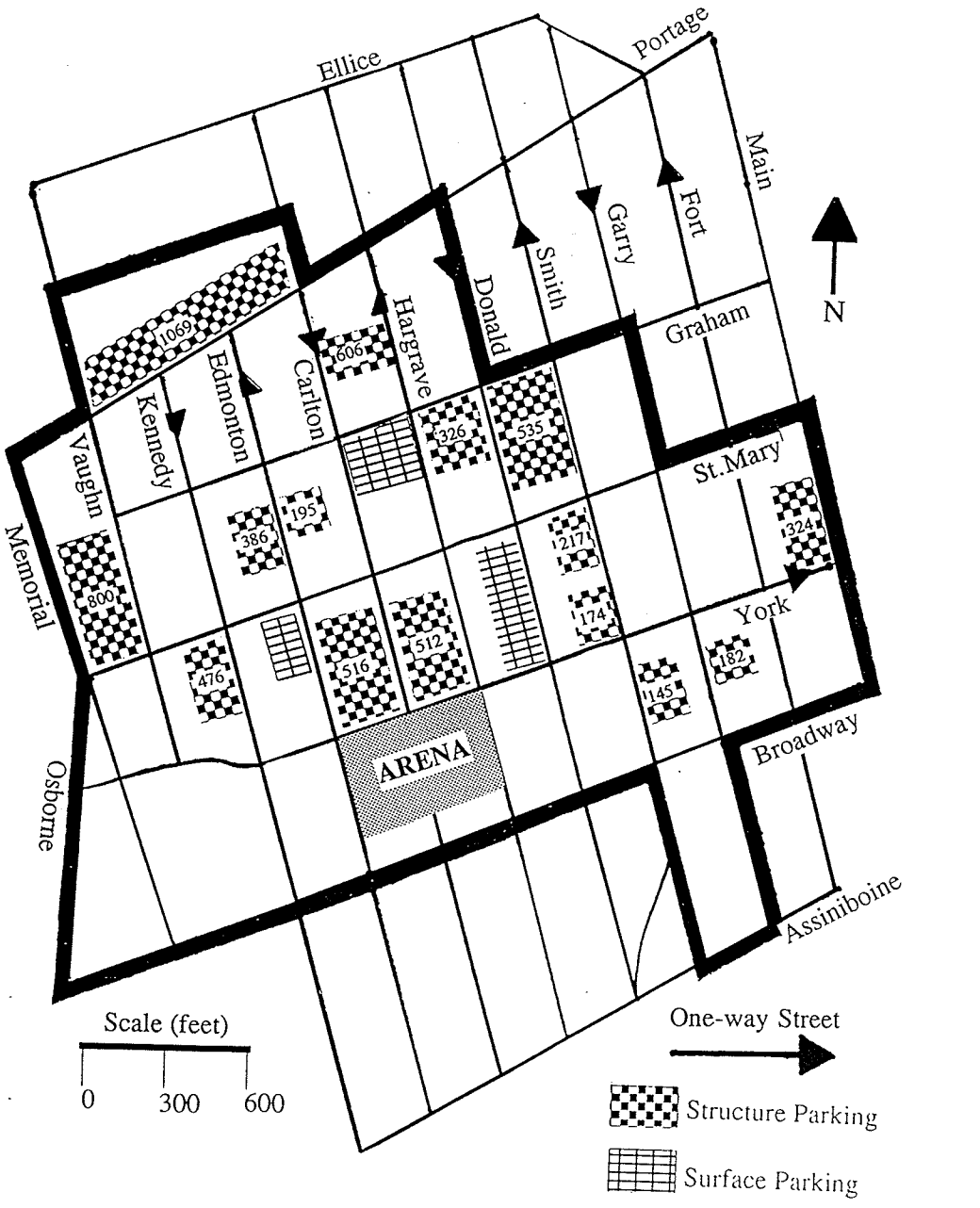

Figure 7. 10 minute parking zone-Winnipeg Convention Centre arena site.

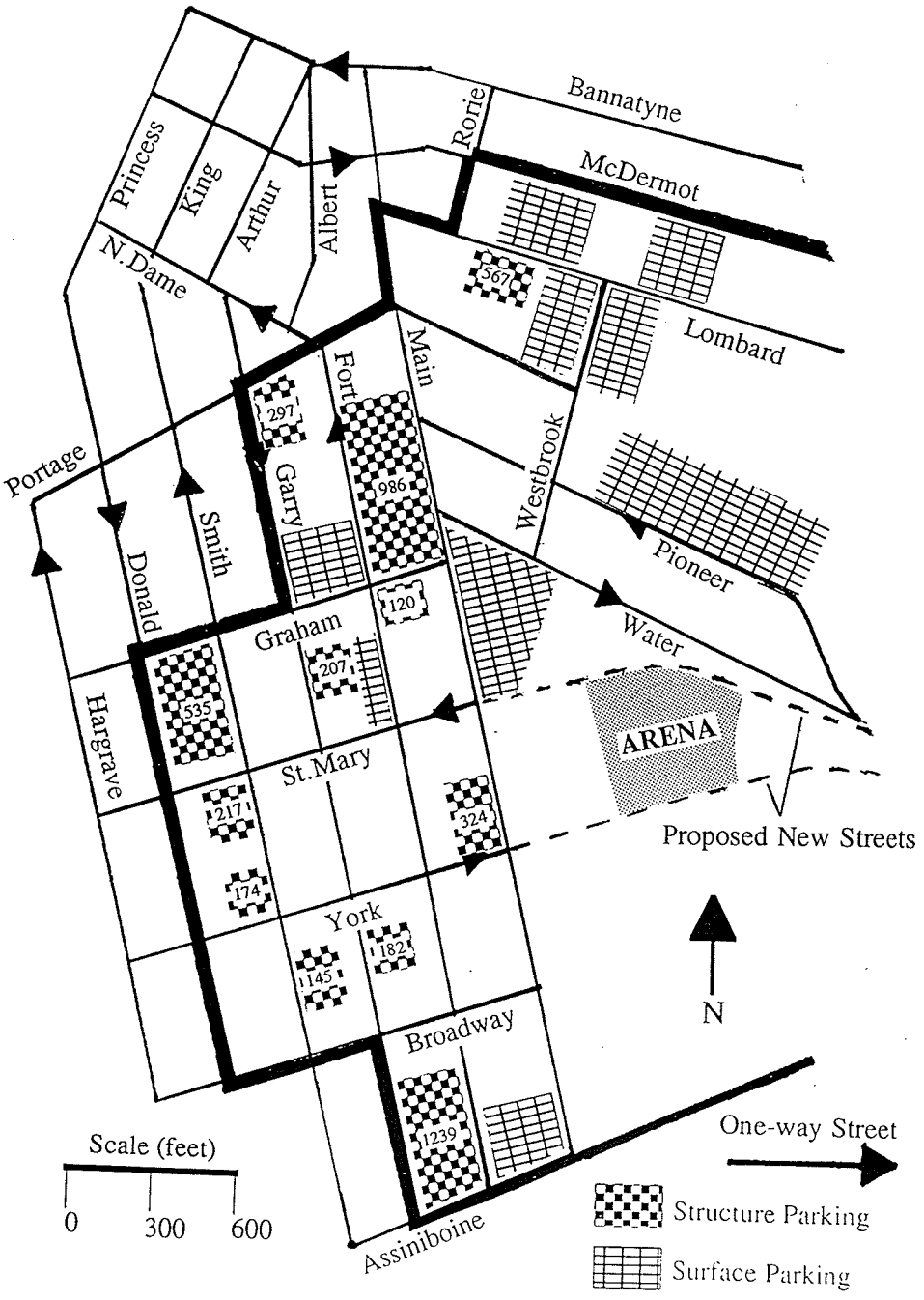

Figure 8. 10 minute parking zone-Forks arena site. 986 Number of Parking Spaces

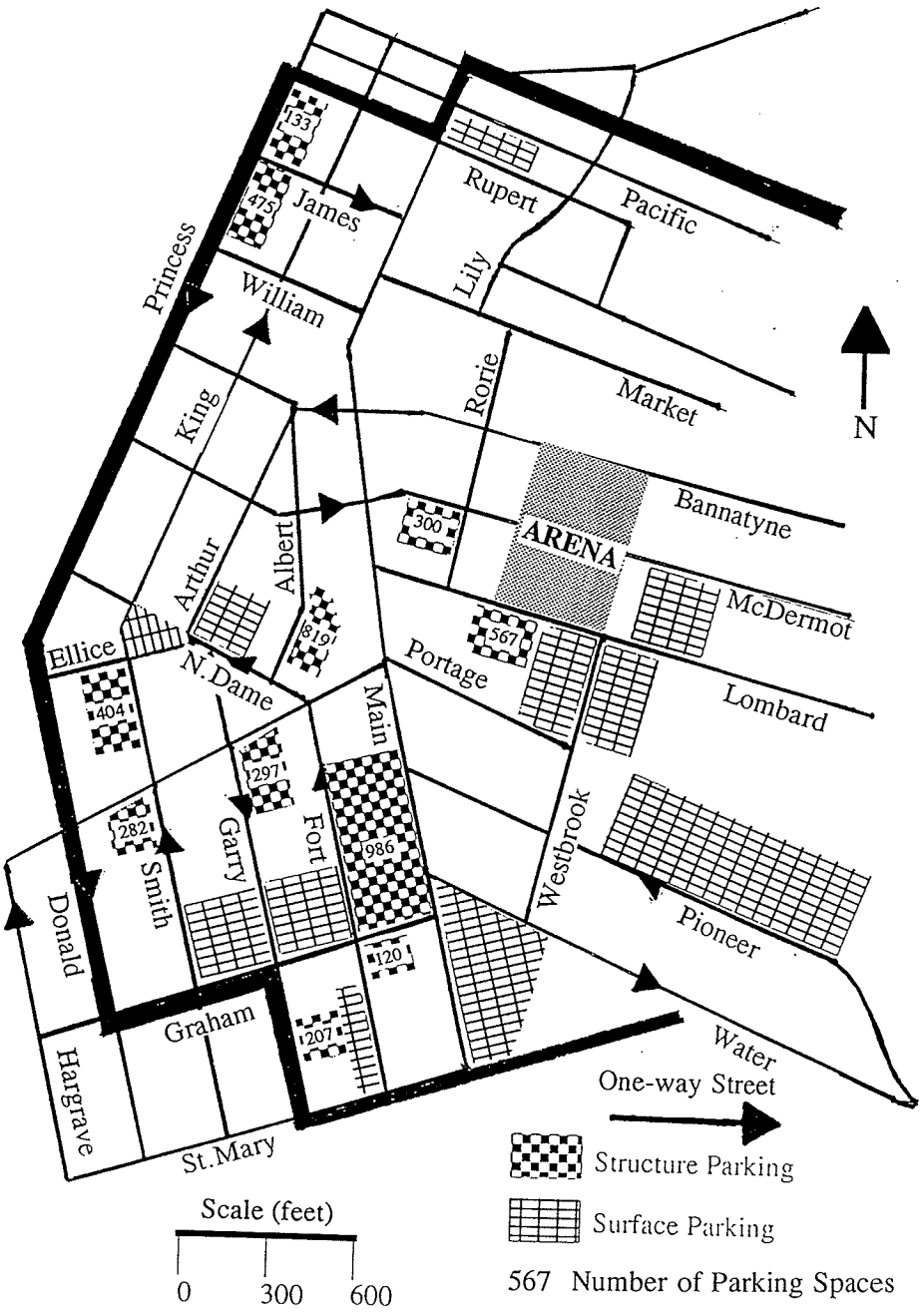

Figure 9. 10 minute parking zone-Lombard Ave. arena site.

4.3 Regional Traffic Projections

4.3.1 Travel and Arena Patron Characteristic Assumptions

Traffic projections were developed based on a hockey game due to its recurring frequency and generally larger attendance figures than other possible arena events. Assumptions regarding hockey game travel and patron characteristics include:

A) 75% of all arena patrons were anticipated to arrive via private automobile, with the remaining 25% arriving either by public transit, or walking. During normal daytime working hours, approximately 40% of all downtown employees arrive by bus.[2] Following the P.M. peak travel period, transit service to the downtown is reduced and it is expected that based on this decreased level of service, the modal share of transit to evening arena events will be substantially less than daytime work trips. Therefore, a combined public transit and pedestrian modal share of 25% provides a more realistic indication of non-automobile use.

B) The average vehicle occupancy was projected to be 2.5 persons/car.

C) The average attendance for hockey games was forecast at 16,000 spectators. The average attendance at a new downtown facility should increase due to such factors as a central location and improved spectator amenities. The projected attendance represents an increase of approximately 2,500-3,000 patrons over current levels.

D) Season ticket holders were projected to occupy 8,000 seats, with non-season ticket holders occupying the remaining 8,000 seats. The season ticket base of 8,000 represents

[2] The City of Winnipeg Travel and Demographic Trends 1962-1986, January 1988, p.21

an increase of approximately 1,500-2,000 over current levels and was assumed to be attributed to improved seating and spectator amenities.

E) All season ticket holders residing outside the downtown were expected to arrive via automobile. It was assumed that season ticket holders' socio-economic status made them more inclined to arrive by automobile. Non-season ticket holders were forecast to constitute all transit trips.

F) Presently, virtually all weekday games commence at 7:30 P.M, and consequently, the peak arrival period was expected to be between 6:30-7:30 P.M. Although departures from arena events are more concentrated than arrivals, background traffic volumes during departure times are lower. The 6:30-7:30 P.M. peak hour is expected to have higher background traffic volumes due to higher levels of other downtown activities. It was anticipated that during post-game periods, traffic impacts would either be equivalent or less than those during the arrival period.

G) 75% of all spectators were projected to arrive during the peak hour with 15% remaining downtown following working hours and 10% arriving following the peak period.

H) One-third of all peak hour vehicle trips were anticipated to arrive during the first half hour with the remaining two-thirds arriving the latter half hour.

I) All spectators residing in downtown postal codes (R3A, R3B, R3C) would either

walk or arrive by public transit.

J) All spectators residing in areas outside the Perimeter Highway would arrive by automobile.

4.3.2 Trip Generation Projections

The number of vehicle trips generated by a hockey game were estimated based on:

i) arena attendance;

ii) modal split;

iii) average vehicle occupancy.

The total number of vehicle trips was estimated at 4,800. During the peak hour of arrival, it was estimated that 3,600 vehicles would arrive downtown with 1,200 arriving the first half-hour and 2,400 arriving during the latter half-hour.

4.3.3 Trip Distribution Projections

Trip distribution projections were conducted in two stages. Different methodologies were involved in forecasting the origins of season and non-season ticket holders. Season ticket holder data was unavailable from the Winnipeg Jets hockey club.

4.3.4 Season Ticket Holders

In projecting the origins of season ticket holders, the initial step involved subdividing Winnipeg into postal codes and peripheral areas. The average household income from Statistics Canada's 1986 Census for each postal code/area and the city's average household

income was obtained.

It was assumed that an arena would be completed by 1996. Therefore, 1996 population forecasts for each postal code/area were developed from population projections provided by the City Of Winnipeg Planning Department for smaller neighbourhoods. A 1996 population forecast for each postal code/area was estimated by inserting the small neighbourhoods into the appropriate areas. Most neighbourhoods were accommodated within one area. In those circumstances where a neighbourhood overlapped, the area constituting the majority of the neighbourhood received the entire population. The 1996 population projections for each postal code/area are summarized in Table 14 of Appendix 2. Population projections were unavailable for East and West St. Paul.

An important assumption regarding season ticket holders was the dependency of origin on household incomes. It was assumed that the significant expenditure required for purchasing season tickets was more easily affordable as household income increased. A population adjustment factor was created to compensate for the impact of average household incomes. It was also assumed that socio-economic conditions were not factors that influenced the interest in hockey.

A population adjustment factor for each postal code/area was derived in the following manner. Firstly, Winnipeg's 1986 average household income was assigned a neutral adjustment factor of 1.0. It was assumed that postal codes/areas would retain similar socio-economic conditions relative to one another between 1986 and 1996. Secondly, it was assumed that an incremental relationship would exist between average household income and

the ability to afford season tickets. For each increment of $1000 in average household income above the city average, 0.1 was added to the base factor of 1.0. Conversely, for every $1000 decrease from the average, 0.1 would be deducted from the base factor. This approach attempted to compensate more precisely for the impacts of varying household incomes on ticket purchasing power. Using this technique, each postal code/area was assigned an adjustment factor that was multiplied by the projected population to produce an adjusted 1996 population. Tables 15 and 16 in Appendix 2 illustrate the adjustment factors and adjusted populations for each postal code/area.

Adjusted 1996 populations were combined to produce an adjusted metropolitan area population. The proportion of season ticket holders located within each postal code/area was determined by dividing the individual adjusted populations by the adjusted metropolitan area population. The number of season ticket holders in each postal code/area was determined by multiplying the proportions by the overall number of season tickets. Table 17 in Appendix 2 summarizes the number of season ticket holders and vehicle trips originating from each postal code/area.

4.3.5 Non-Season Ticket Holders

The origins of non-season ticket holders were assumed to be income independent based on the assumption that non-season ticket holders would not attend many hockey games, and consequently, not incur significant ticket expenditures. Therefore, socio-economic variables were not incorporated. The only variable used to ascertain the number of ticket holders and vehicle trips originating from each postal code/area was population. For each postal code/area, a 1996 population projection was determined using the techniques for seasons ticket holders.

The proportion of ticket holders in each postal code/area was determined by dividing the individual projected populations by the projected metropolitan area population. The actual number of ticket holders in each postal code/area was determined by multiplying each proportion by the total number of ticket holders. The number of non-season ticket holders and vehicle trips originating from each postal code/area are provided in Table 18 of Appendix 2.

Both groups of patrons were then combined to provide the total number of ticket holders and vehicle trips originating from each postal code/zone, which are summarized in Table 19 of Appendix 2.

4.3.6 Route Assignment Projections

The next phase of the traffic study involved assigning vehicles to the most logical downtown entry routes for each arena site. Trip assignments were conducted in the following manner:

A) Potential downtown entry routes were those utilized by The City Of Winnipeg Streets and Transportation Department for conducting downtown cordon counts. The most logical downtown entry routes for each postal code/area were identified.

B) To approximate route assignments, each postal code/area was subdivided into three or four smaller sub-sections. For each sub-section, the travel distance along each route from its centre to the arena site was approximated from measurements of street maps. Route assignment estimates were based on travel distances. For example, if a sub-section had two logical entry routes, the route with a travel distance of approximately one kilometre less received 100% of vehicle traffic. If the difference in travel distances

was approximately one-half kilometre, the shorter route received three times as much traffic or a 75/25 split. Routes with similar travel distances received identical traffic volumes. This technique was applied for each sub-section. The route assignment estimates for each individual sub-section were combined to generate assignment projections for the entire postal code/area. Information on downtown route assignments for each site is contained in Tables 20-22 of Appendix 2.

C) The number of vehicles using downtown entry routes was determined for each site by adding the totals of the projections for individual postal code/areas. The number of hourly and half-hourly vehicle trips assigned to specific downtown entry routes for each site are summarized in Tables 23-25 of Appendix 2.

4.4 Circulation Projections-Arena Traffic

The next phase of the traffic study involved projecting the circulation patterns of event generated traffic. Downtown traffic circulation offers the greatest potential for congestion due to the concentration of vehicles in a small area. Before developing traffic circulation projections, certain procedures were undertaken to establish a foundation for the projections including:

i) approximating the number of available spaces in each eligible parking facility;

ii) identifying the entrances to each eligible facility and assuming that arena patrons would be familiar with major parking locations;

iii) dividing each 10 minute parking zone into three approximately equidistant sections (Figures 10-12);

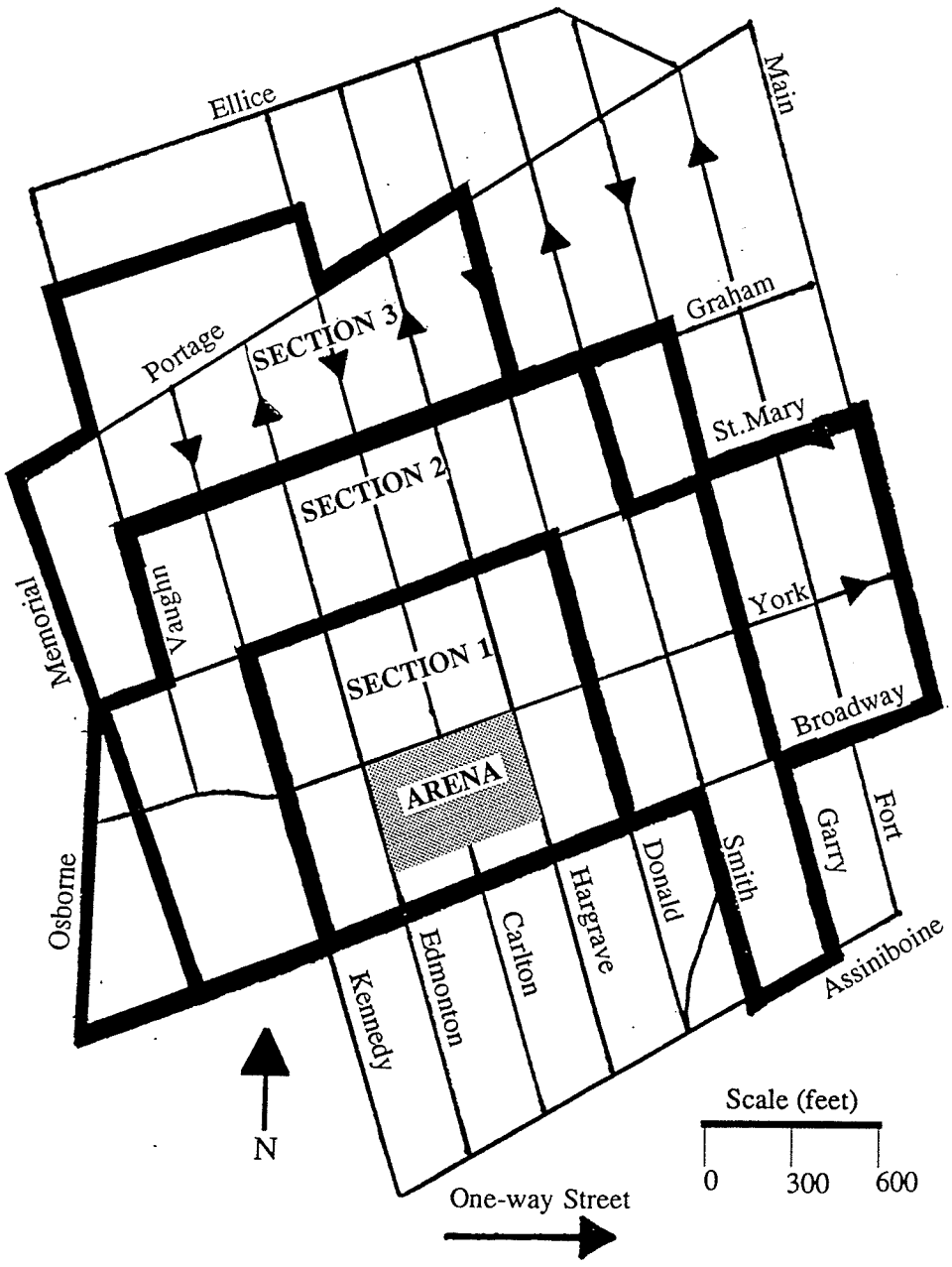

Figure 10. Parking zone sections-Winnipeg Convention Centre arena site.

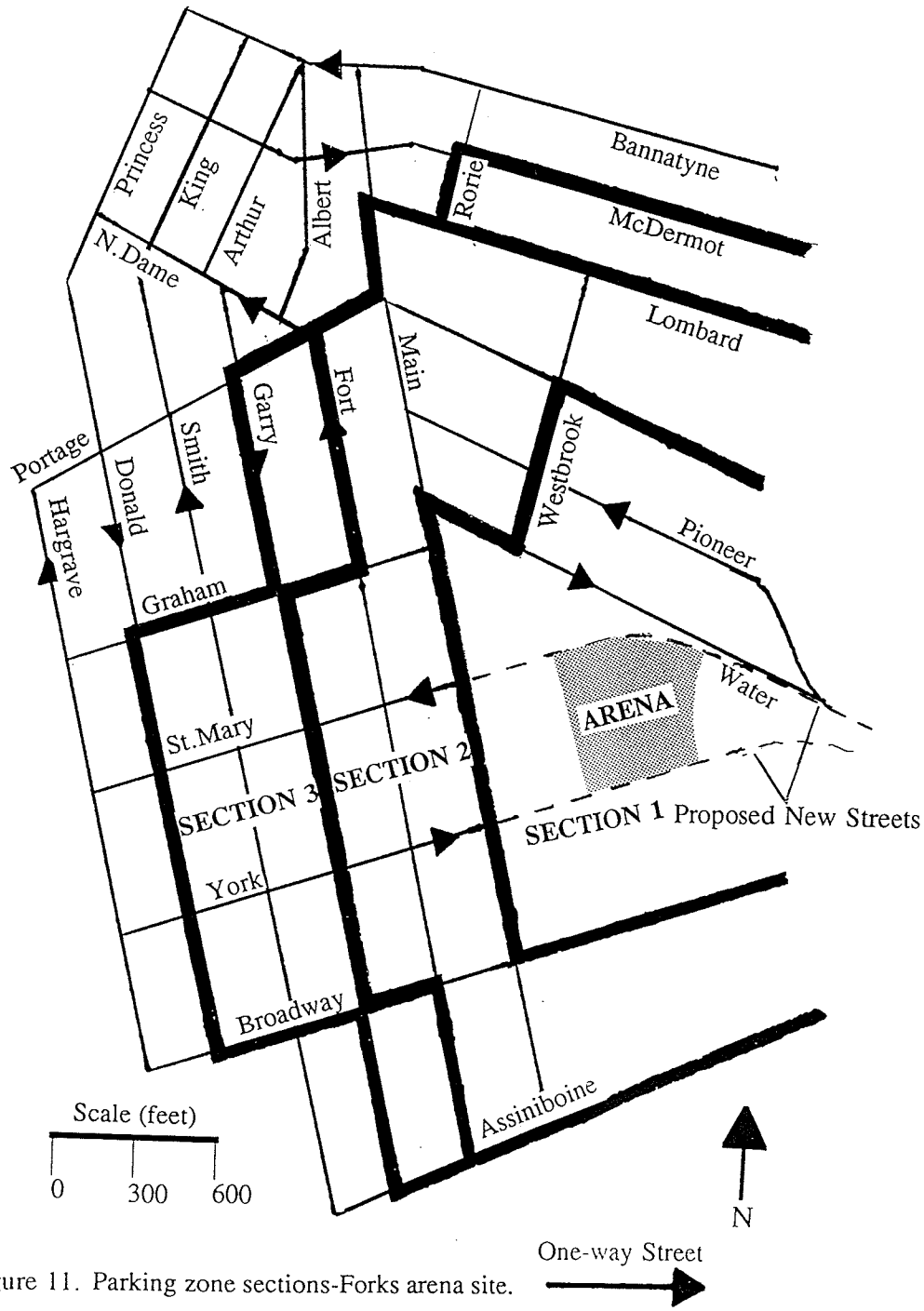

Figure 11. Parking zone sections-Forks arena site.

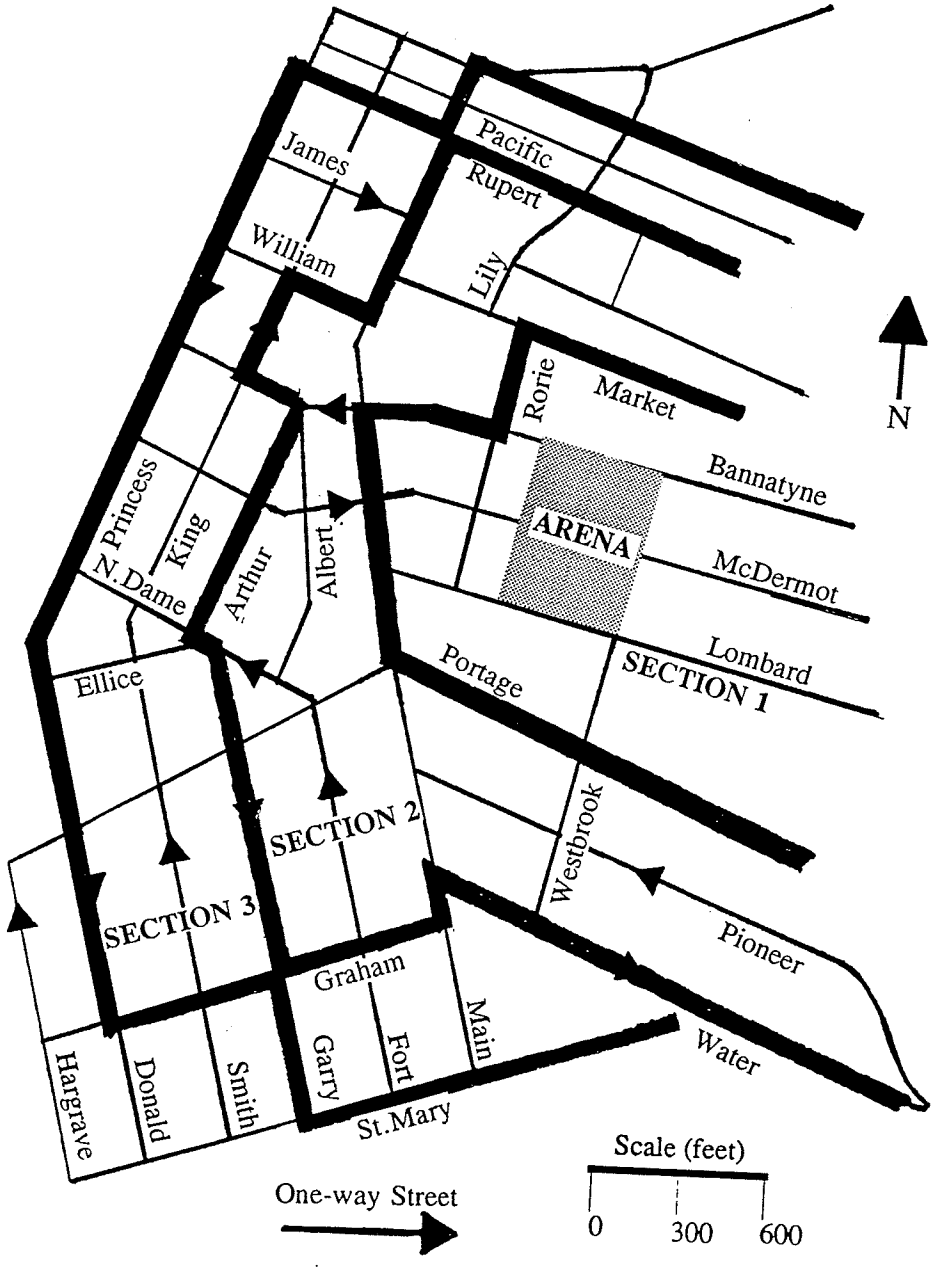

Figure 12. Parking zone sections-Lombard Ave. arena site.

iv) developing traffic circulation patterns for both the 6:30-7:00 P.M. and 7:00-7:30 P.M. periods;

v) developing traffic circulation patterns based on existing street conditions. Future projects such as the Graham Ave. transit mall, the York-St. Mary Ave. extension, and the possibility of on-site parking facilities were not included.

4.4.1 Arena Traffic: 6:30-7:00 P.M.

Traffic circulation patterns for the 6:30-7:00 P.M. period were conducted in the following manner:

A) It was assumed that all arena-generated traffic during this period was destined for parking facilities located in Section 1, with traffic primarily gravitating towards the entrances of major parking facilities.

B) Traffic from each downtown entry route was assigned to the most logical route(s) providing access to major parking facility entrances. It was assumed that if parking spaces were directly or easily accessible in Section 2 facilities, a reduction in traffic volumes destined for major Section 1 facilities would occur along that route. For example, either 10% of route traffic or the number of available spaces in Section 2 facilities, whichever was less, was employed as the volume reduction. The 10% figure was based on the assumption that the vast majority of arena spectators arriving during the 6:30-7:00 P.M. period would want parking near the arena and that few would choose parking further away. It was also assumed that if entrances to smaller Section 1 parking facilities were directly, or easily, accessible and in advance of the primary parking areas, the smaller lots would be fully occupied. Consequently, a further reduction in traffic

volumes was applied along those affected routes.

C) Traffic that could not be accommodated in Section 1's parking facilities was assigned to the most logical facilities located in Section 2.

4.4.2 Arena Traffic: 7:00-7:30 P.M.

Traffic circulation projections for the 7:00-7:30 P.M. period were conducted in the following manner:

A) Event traffic was assumed to be destined for parking facilities in Section 2, primarily gravitating towards the entrances of major parking areas.

B) Traffic along each downtown entry route was assigned to the most logical route(s) accessing the entrances to major Section 2 parking facilities. Circulation patterns during this period were adjusted using three procedures. Firstly, the number of available spaces in certain Section 2 facilities was reduced to factor the spaces filled during the previous half-hour. Secondly, it was assumed that if parking was directly or easily accessible in Section 3 facilities, a reduction in traffic volumes along routes destined for Section 2 facilities was incorporated. For example, a traffic volume reduction of 50% or available Section 3 parking facility supply (lesser of the two) was used. The 50% figure is substantially greater than the 10% used for the 6:30-7:00 P.M. period. This figure was based on the assumption that many spectators arriving near the commencement of a hockey game would be more inclined to park further away, thus ensuring themselves a space and saving time, rather than facing an indefinite search for more immediate facilities. Thirdly, it was assumed that if smaller Section 2 parking lots

were directly, or easily, accessible and in advance of major facilities, they would be occupied to capacity, consequently reducing traffic volumes along affected routes.

C) Traffic that could not be accommodated in Section 2 parking facilities was assigned to the most logical parking areas in Section 3.

4.5 Traffic Impact Analysis

Determining the impacts of arena traffic on downtown intersection operations was conducted in the following manner:

A) Following event-traffic circulation projections, both half hour volumes were combined, producing hourly figures. Key intersections near each site were selected for analysis. Those intersections which were selected exhibited significant event-generated hourly traffic volumes. Intersections selected for analysis from each site are illustrated in Figures 13-15.

B) Hourly non-event traffic volumes were approximated for each selected intersection. Intersection counts for the 6:30-7:30 P.M. period were unavailable and as a result, either 6:00-7:00 P.M. counts or 5:45-6:00 P.M. counts, expanded to one hour, were used to approximate non-event traffic volumes. Most of the intersection counts, conducted by the City of Winnipeg Streets and Transportation Department, were done between the late 1970's and mid 1980's. To reflect 1996 conditions, a one percent annual traffic growth rate was applied.

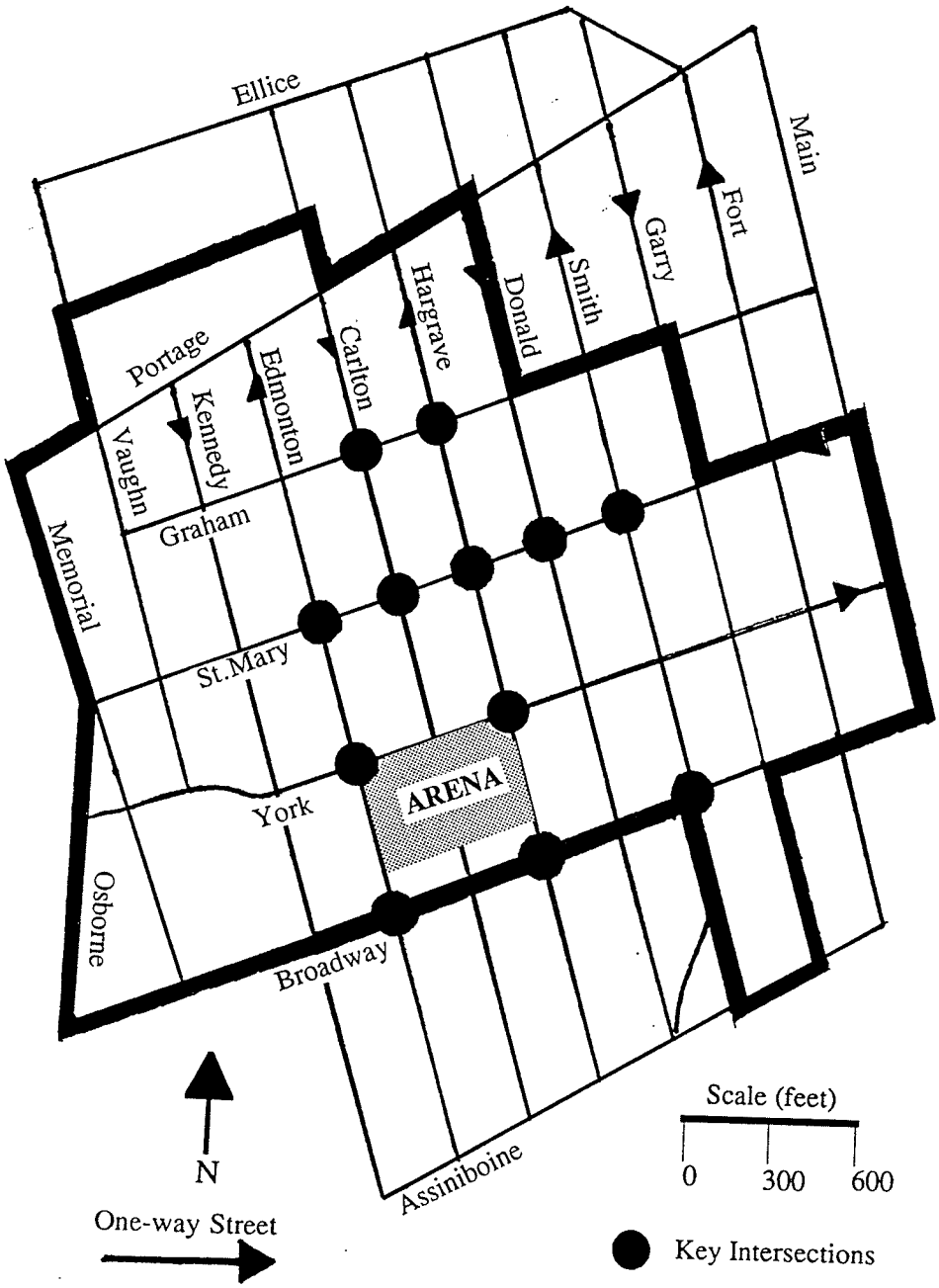

Figure 13. Key intersections-Winnipeg Convention Centre arena site.

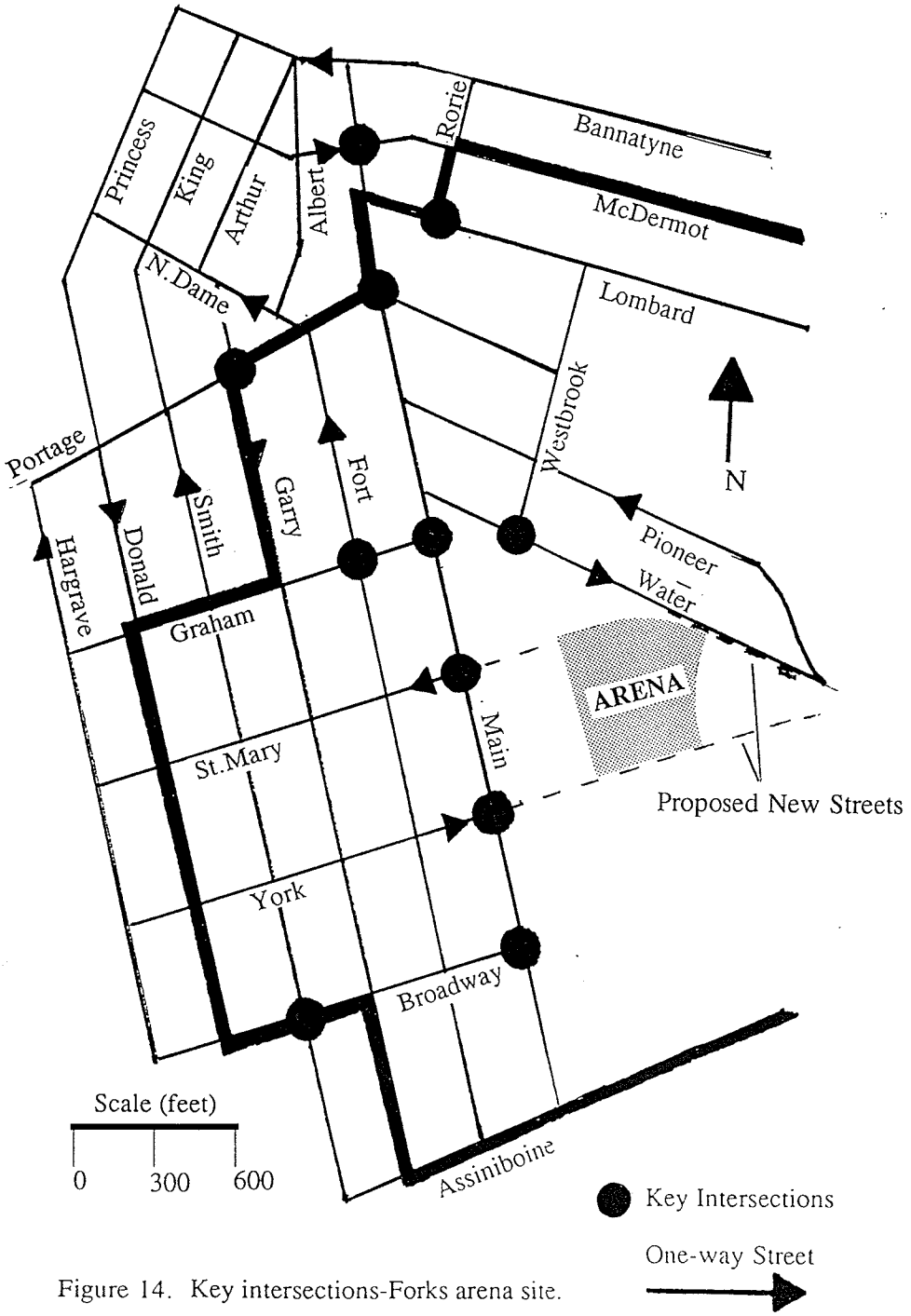

Figure 14. Key intersections-Forks arena site.

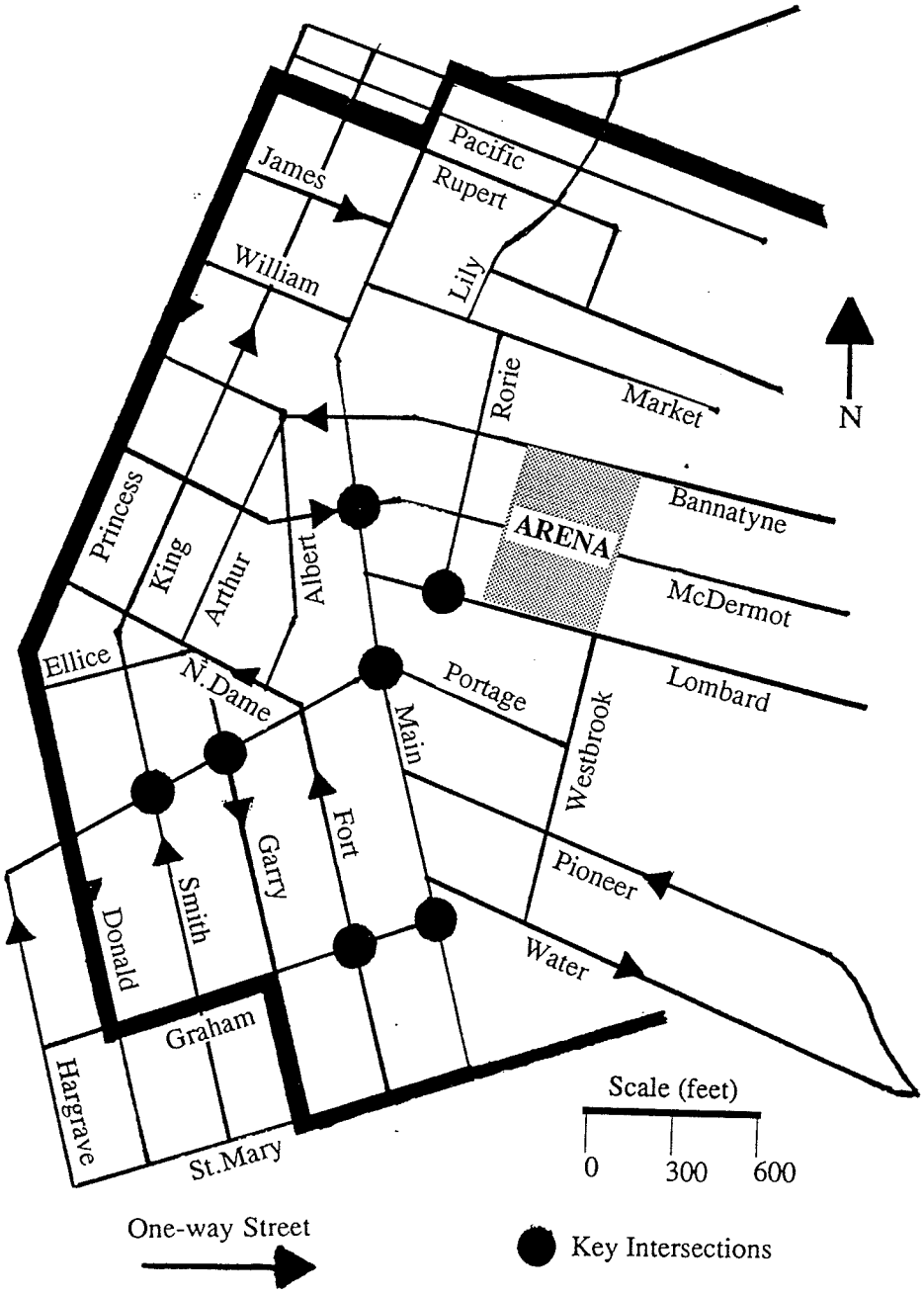

Figure 15. Key intersections-Lombard Ave. site

C) Traffic signal information, including cycle lengths and phasing of the selected intersections for the 6:30-7:30 P.M. period was obtained. The number of lanes and their permitted movements were obtained for each intersection approach, as were parking conditions along each approach during the peak arrival period.

D) Intersection analyses were performed using a computer software package known as Highway Capacity Software. A peak hour factor (PHF) was not derived from the traffic circulation projections (many 15 minute counts were unavailable), resulting in an estimated PHF of 0.95 being used for the analyses. Two traffic scenarios were analyzed. Firstly, intersection analyses based on background traffic were conducted to assess existing operations. Secondly, arena-generated traffic volumes were added to background volumes to assess the operation of various intersections during peak hour arrival periods.

Comparison of the two scenarios illustrates the impacts on various traffic movements due to arena-generated traffic. Intersection performance was evaluated based on level of service (LOS). Level of service (LOS) is defined in terms of average stopped delay per vehicle in seconds.[3] The LOS ranges from A through F, with A being the optimum operating condition and D being the minimum acceptable level. Each level of service and its corresponding delay is summarized in Table 1.

[3] William R. McShane and Roger P. Roess. Traffic Engineering, (New Jersey: Prentice Hall, 1990), p.419

Table 1. Level of Service-Signalized Intersections

Level Of Service	Stopped Delay/Vehicle (sec)
A	<5.0
B	5.1 to 15.0
C	15.1 to 25.0
D	25.1 to 40.0
E	40.1 to 60.0
F	>60.0

E) Pedestrian volumes were not included in the intersection analyses. It was assumed that background pedestrian traffic during the 6:30-7:30 P.M. period would be insignificant and, as a result, not affect the operation of downtown intersections. Event pedestrian traffic was not incorporated for the following reasons:

i) For the Lombard Ave. site, a significant amount of pedestrian traffic is expected through the underground pedestrian walkway system in the vicinity of Portage Ave. at Main St., due to the presence of three large parking facilities. As most of the parking for this site is located in the vicinity of Portage Ave. at Main St. and east of Main St., the impact of event pedestrian traffic on the performance of the selected key intersections was considered minimal.

ii) For the Winnipeg Convention Centre site, it was assumed that the downtown pedestrian walkway would be completed and extended to this site if an arena was to be built. With the majority of the parking spaces for this site integrated into the walkway system, it was assumed that event pedestrian traffic would only minimally affect the operations of key intersections.

iii) Although the Forks site cannot be integrated into the pedestrian walkway system, it is

not expected that outdoor pedestrian access would significantly affect the performances of key intersections. The key intersections that are forecast to experience large volumes of pedestrian traffic are along Main St., south of Portage Ave. With the vast majority of traffic volumes at these intersections along Main St., pedestrian traffic crossing Main St. is expected to minimally affect the performance of these intersections under existing traffic signal operations.

F) For those intersections that experienced significant operating difficulties during event arrival periods, the impact of traffic engineering improvements were analyzed to ascertain their effectiveness for improving intersection performance.

CHAPTER 5

SITE TRANSPORTATION IMPACTS

5.1 Introduction

Chapter 5 is an examination of the transportation impacts associated with each potential arena site, focusing on vehicular and pedestrian accessibility, parking and public transit. Each site's location, surrounding land uses and other important downtown activity centres are illustrated in Figure 16.

5.2 Transportation Impacts: Winnipeg Convention Centre Site

5.2.1 Site Description

Two large off-street surface parking lots comprise the site along with a portion of Carlton St., which would have to be closed between York Ave. and Broadway. Site dimensions are approximately 620 ft along the east-west axis and 350 ft along the north-south axis. The location is near the southern edge of downtown and within a 10 minute walk of Portage Ave.

5.2.2 Vehicular Accessibility

Most signalized intersections within the designated study area are projected to function at levels of service C, or better, under existing signal, geometric and traffic conditions (Table 2). Intersections projected to experience operating problems include:

i) Hargrave St. at St. Mary Ave.;

ii) Broadway at Hargrave St.;

iii) Broadway at Edmonton St.;

iv) Donald St. at St. Mary Ave.

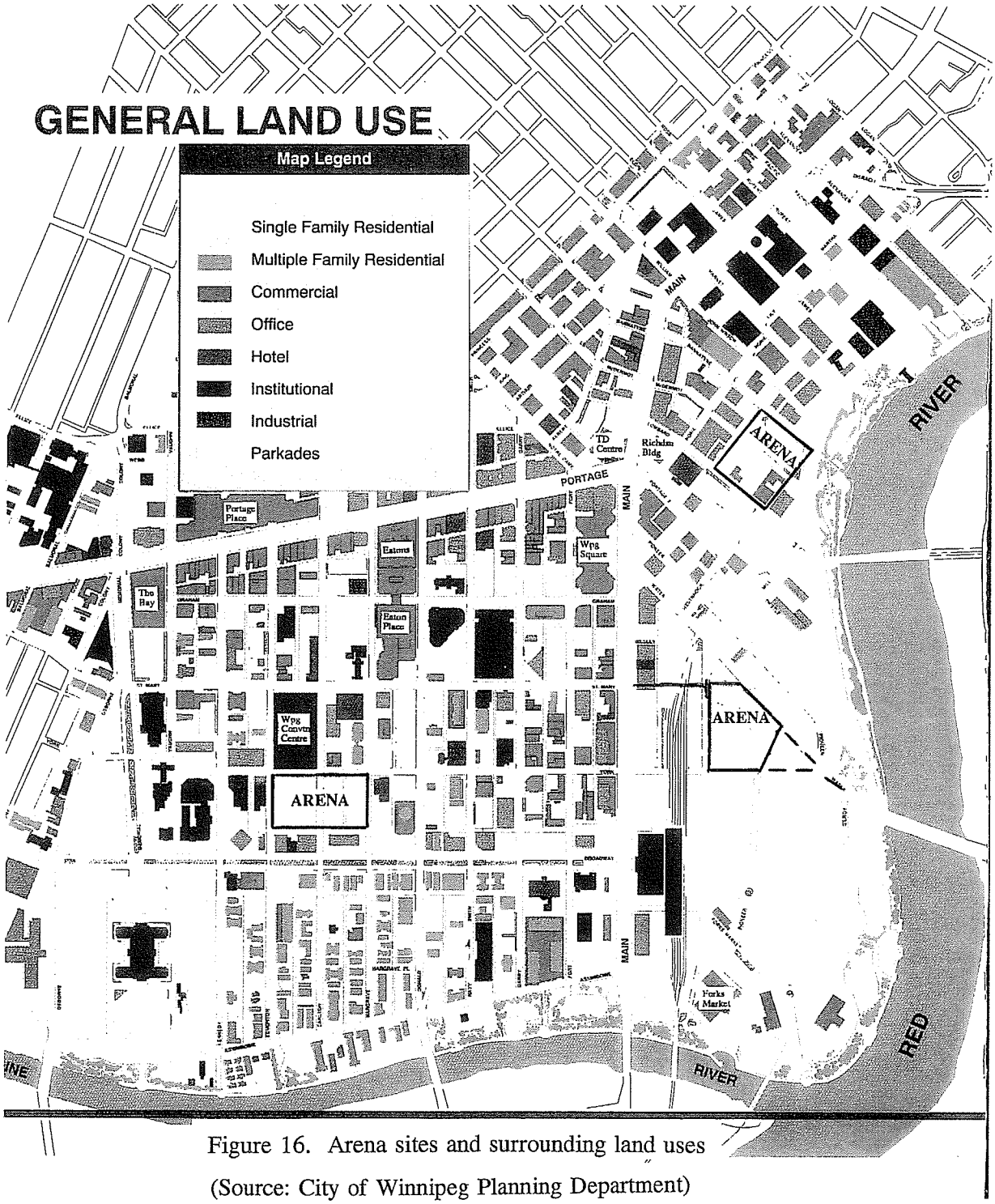

Figure 16. Arena sites and surrounding land uses

(Source: City of Winnipeg Planning Department)

Table 2. Intersection Performance Summary-Winnipeg Convention Centre Site

	Background Traffic		Background and Arena Traffic	
Intersection	**Volume/ Capacity**	**LOS**	**Volume/ Capacity**	**LOS**
1. Hargrave at York	.16	B	.72	B
2. Hargrave at St. Mary	.42	B	*	*
3. Carlton at St. Mary	.41	B	.72	B
4. Edmonton at York	.29	B	.58	B
5. Edmonton at St. Mary	.38	B	.76	B
6. Carlton at Graham	.40	B	.61	C
7. Hargrave at Graham	.28	B	.45	B
8. Broadway at Edmonton	.42	B	*	*
9. Broadway at Hargrave	.52	B	*	*
10. Broadway at Smith	.73	B	.90	C
11. Donald at St. Mary	.68	B	.90	E
12. Smith at St. Mary	.71	B	.96	C

* LOS is worse than F or Volume/Capacity (V/C) is greater than 1.2

The LOS and Volume/Capacity (V/C) of these four intersections can be improved to acceptable standards (minimum LOS=D) by using inexpensive traffic engineering solutions (Table 3).

Table 3. Intersection Operating Improvements-Winnipeg Convention Centre Site

Intersection	Problem(s)	Solution(s)
1. Hargrave at St. Mary	-Northbound left turn from Hargrave St. to St.Mary Ave. -Westbound through and right turn traffic.	-convert an existing northbound through lane into a shared use lane. -reallocate 3 seconds of green time from northbound to westbound traffic. LOS=C, V/C=.94
2. Broadway at Hargrave	-Eastbound left turn from Broadway to Hargrave St.	-create an exclusive eastbound left turn lane and convert an existing eastbound through lane into a shared use lane. -create a leading protected left turn phase of 15 seconds, transferring time from east-west and north movements. LOS=D, V/C=.71
3. Broadway at Edmonton	-Eastbound left turn from Broadway to Edmonton St. -Eastbound through movement along Broadway	-create an exclusive eastbound left turn lane and convert an existing eastbound through lane into a shared use lane. -create a leading protected left turn phase of 10 seconds, transferring time from east-west and north movements. LOS=B, V/C=.60
4. Donald at St. Mary	-Westbound through movement along St. Mary Ave.	-reallocate green time (6 seconds) from southbound to westbound movements. LOS=C, V/C=.90 **or** -remove parking along St. Mary both east and west of Donald and retain existing signal operations. LOS=B, V/C=.73

Due to the arena site covering two city blocks, Carlton St. between York Ave. and Broadway would have to be permanently closed. Changes in local circulation patterns would occur but their impacts on surrounding intersections are expected to be minimal.[1] Carlton St. between York Ave. and Broadway is generally used as a local traffic circulation route, and

[1] Fred Corey, City of Winnipeg Streets and Transportation Department

consequently, the volume of traffic affected is relatively minor. The distribution of traffic to other southbound routes, primarily Donald St., Kennedy St. and Memorial/Osborne, would not generate significant adverse impacts on the operation of nearby intersections.

A largely residential area is located south of Broadway. Arena patrons may infiltrate this area to seek free, on-street parking spaces and consequently create undesirable traffic conditions, affecting the quality of the neighbourhood. Various measures, such as implementing time limited on-street parking, should be considered for reducing neighbourhood infiltration by arena traffic.

Within the next 15 years, two projects are forecast to be developed that will affect downtown access and circulation patterns at this site. These are:

i) the Graham Ave. transit mall;

ii) the extension of the York-St. Mary Ave. one-way couplet.

The Graham Ave. transit mall is proposed to be closed to non-transit vehicles between Fort St. and Carlton St. Event-traffic circulation patterns would be affected to some extent. Several hundred vehicles are projected to use Graham Ave. either as an access route into the parking zone, or as a circulation route between Donald St. and Edmonton St. during the peak hour of arrival. The closing of Graham Ave. would make access to certain parking facilities, particularly those at the Centennial Library, Eaton Place surface lot and the Eaton's structure along Hargrave St. less convenient for patrons. Assuming no changes in parking patterns, patrons normally using Graham Ave. to enter the parking zone to access these facilities would be required to use either St. Mary Ave. or Portage Ave. Patrons within the parking zone

normally using Graham Ave. between Donald St. and Carlton St. for circulation purposes would have to find alternative routes. It is expected that both the St. Mary-York Ave. couplet and Portage Ave. should have the available capacity to accommodate the distribution of both background and arena traffic volumes from Graham Ave. If problems develop, removing some on-street parking along York-St. Mary Ave and the north-south one-way streets should be considered for increasing intersection capacities in the area. The distribution of arena traffic from Graham Ave. to either Portage Ave. or St. Mary-York Ave., followed by subsequent distribution to north-south one-way streets located east of Donald St., would not significantly affect the operation of intersections near the arena. Although severe impacts are not anticipated, additional traffic analysis is recommended, if the transit mall is implemented, in order to better ascertain traffic conditions and develop possible alleviating traffic management strategies.

Extension of the York-St. Mary Ave. one-way couplet would channel some event traffic from the Provencher Bridge to the one-way pair and would also divert some crosstown traffic to the couplet. Under existing street conditions, event traffic from the Provencher Bridge would be distributed between Graham Ave. and the York-St.Mary Ave. couplet. As only one downtown approach would be affected, slight modifications to event-traffic patterns are forecast and consequently, minor impacts would be anticipated along York-St. Mary Ave. intersections, between Main St. and Edmonton St. The distribution of some crosstown traffic to the couplet from Portage Ave. could easily be accommodated by removing some on-street parking, near the arena site, along one side of York and St. Mary Ave.

5.2.3 Parking

There are approximately 6,500 available off-street parking spaces within a 10 minute walk of the site, which could easily accommodate the projected arena parking demand of 4,800 vehicles. A pedestrian connection to the Winnipeg Convention Centre and completion of the downtown pedestrian walkway system would theoretically connect the arena with several major parking structures within the 10 minute walk parking zone (Table 4).

Table 4. Walkway Connected Parking Facilities-Winnipeg Convention Centre Site

Parking Location	Total Spaces	Pre-Game Access	Post-Game Access
1. Winnipeg Convention Centre	516	*Yes	*Yes
2. Holiday Inn	512	*Yes	*Yes
3. Eaton Place	326	*Yes	*Yes
4. Centennial Library	535	*Yes	No
5. Eaton's	606	*Yes (Wed-Fri)	No
6. Portage Place	1069	*Yes (Wed-Fri)	No
7. 144 Kennedy	476	No	No
8. The Bay	800	No	No

* Assumes walkway connection with Winnipeg Convention Centre

Under existing hours of operation, completion of the walkway system would provide climate-controlled arena access from most major parking facilities during Wednesday through Friday evenings during pre-game periods. Extending the hours of walkway operations between the Winnipeg Convention Centre and The Bay for pre-game access would require negotiations with property owners. Use of the walkway during Monday and Tuesday evenings would be

unavailable for patrons parking at either Portage Place or at the Eaton's facility on Hargrave St. Post-game access to most parking facilities, via the overhead walkway, would require negotiations with property owners to extend the hours of operation. Access to the Eaton's and Portage Place parking facilities, via the walkway, would be impossible following arena events.

Parking conflicts with major events at the Winnipeg Convention Centre, and to a smaller extent with Christmas season shoppers, would occur. The number of major arena events expected to coincide simultaneously with large Winnipeg Convention Centre exhibitions is small. The largest Winnipeg Convention Centre attractions, such as Octoberfest and automobile shows, would conflict with only a few games during the year. Conflicts with Christmas seasons shoppers would be most severe at the Eaton Place indoor and outdoor parking facilities and the Eaton's facility on Hargrave St. The most acute situations would occur during Friday evenings when shopping activities and arena attendance are expected to be at their greatest. However, few games take place on Friday evenings during the Christmas shopping season, thus reducing any negative impacts.

In excess of 500 off-street surface parking spaces would be displaced to accommodate the arena, which could be replaced with the construction of a 500-1,000 space, on-site facility. The attributes of the surrounding street system are generally favourable for incorporating a large parking structure.[2] A parking facility at this location could benefit from shared use by having individuals displaced during construction, arena tenants and management occupying spaces during daytime working hours, with arena patrons using the facility during evenings. A

[2] Delcan. A Study Of Parking In Downtown Winnipeg, August 1987, p.131

traffic impact study should be undertaken if significant amounts of on-site parking is contemplated.

5.2.4 Public Transit

This site is within a reasonable 5-10 minute walk of both Graham Ave. and Portage Ave., where most downtown and crosstown transit routes are concentrated. The Graham Ave. transit mall itself would not reduce the travel time of buses and consequently not promote any substantial increase in transit ridership. In the long term, the transit mall is expected to be the terminus for the proposed regional rapid transit busways and implementation of regional projects such as the Southwest Transit Corridor, and others, could augment transit's modal share. However, these rapid transit busways are not expected to be developed in the foreseeable future.

5.2.5 Pedestrian Accessibility

As previously indicated, almost 5,000 parking spaces are integrated into the downtown walkway system within the parking zone, theoretically providing climate-controlled, relatively safe arena access for several thousand patrons. Although some portions of the walkway system would be unavailable at times, outdoor pedestrian accessibility is good, with virtually all downtown streets north of the site, where most spectators would be expected to park, being well illuminated. Few spectators would be expected to park in the perceived less friendly area, adjacent to Broadway, minimizing pedestrian apprehension.

Significant volumes of pedestrian traffic could be expected through both the Eaton's department store and the Eaton Place shopping centre, whenever the pedestrian walkway is

open. Smaller volumes of pedestrians could be expected through the Portage Place shopping centre and The Bay department store. Pedestrian traffic through these major commercial areas enhances the potential for synergies and additional economic activity during pre-event periods. The high concentration of restaurants in the vicinity of the Winnipeg Convention Centre could also benefit from large volumes of pedestrian traffic.

5.3 Transportation Impacts: Forks Site

5.3.1 Site Description

At present, this site and its periphery remain undeveloped, and were formerly the CN East Yards, which consisted primarily of railway tracks and warehouses. Under the existing proposal for the York-St. Mary Ave. extension, the available footprint is insufficient for accommodating an arena. Relatively minor realignments of the proposed St.Mary Ave. extension and Pioneer Blvd. would be required to produce adequate site dimensions. The site is approximately a 10 minute walk southeast of Portage Ave. at Main St., and within a five minute walk north of the Forks Market.

5.3.2 Vehicular Accessibility

Eight signalized intersections within the designated study area are projected to experience operating deficiencies during arrival periods under existing signal, geometric and traffic conditions (Table 5). All other intersections are forecast to operate at a levels of service C or better.

Table 5. Intersection Performance Summary-Forks Site

	Background Traffic		Background and Arena Traffic	
Intersection	**Volume/ Capacity**	**LOS**	**Volume/ Capacity**	**LOS**
1. Westbrook at Water	.51	B	.79	B
2. Fort at Graham	.31	B	.57	E
3. Rorie at Lombard	.60	B	.80	C
4. Portage at Garry	.54	B	.91	E
5. Portage at Main	.97	D	*	*
6. Main at McDermot	.67	C	*	*
7. Main at St. Mary	.56	B	.64	B
8. Main at Graham	.62	B	*	*
9. Main at York	.77	C	.89	E
10. Broadway at Main	.70	C	1.03	E
11. Broadway at Smith	.62	B	*	*

* LOS is worse than F or Volume/Capacity greater than 1.2

Intersections projected to experience operating difficulties include the following:

i) Fort St. at Graham Ave.;

ii) Portage Ave. at Garry St.;

iii) Portage Ave. at Main St.;

iv) McDermot Ave. at Main St.;

v) Main St. at Graham Ave.;

vi) Main St. at York Ave.;

vii) Main St. at Broadway;

viii) Broadway at Smith St.

Implementation of inexpensive traffic engineering improvements could improve the operating efficiency of seven intersections to LOS D (Table 6). Only the operation of the Portage Ave. at Main St. intersection could not be improved to acceptable standards. More comprehensive traffic management strategies would be required to alleviate traffic congestion at Portage Ave. at Main St.

Both the Graham Ave. transit mall and the York-St. Mary Ave. extension will affect event-traffic circulation patterns at this site. Some event traffic is projected to use Graham Ave. between Smith St. and Main St. The Graham Ave. transit mall is proposed to be closed for non-transit use between Fort St. and Smith St. Traffic arriving along two specific routes could be affected, namely Smith St. and Garry St. Some traffic along these routes would be destined for the Winnipeg Square parking facility, with an entrance located on Fort St. Assuming that parking patterns do not change, Smith St. traffic could access the facility by using either York Ave. or Broadway to turn north on to Fort St. Northbound Fort St. traffic should easily be accommodated by the intersections at Broadway, York Ave., St. Mary Ave. and Graham Ave., since large volumes of arena traffic are not forecast to use Fort St., south of Graham Ave., due to the absence of major parking facilities.

Table 6. Intersection Operating Improvements-Forks Site

Intersection	Problems(s)	Solution(s)
1. Main at York	-Northbound through and right turn movements from Main St.	-reallocate 8 seconds of green time for north-south movements from east-west movements. LOS=B, V/C=.89
2. Fort at Graham	-Eastbound left turn from Graham Ave. to Fort St. -Westbound right turn from Graham Ave. to Fort St.	-reallocate 4 seconds of green time to eastbound and westbound traffic along Graham Ave. V/C=.58 LOS=B
3. Portage at Garry	-Eastbound through and right turn traffic along Portage Ave.	-reallocate 3 seconds of green time to east-west movements from protected westbound left turn phase. LOS=C, V/C=.91
4. Portage at Main	-Southbound Main St. through traffic -Eastbound left turn from Portage Ave. to Main St.	-no simple traffic engineering solutions, requires more comprehensive traffic management solutions.
5. McDermot at Main	-Northbound Main St. through traffic -Southbound left turn from Main St. to McDermot Ave.	-reallocate 6 seconds to protected southbound left turn phase from northbound movements. -remove parking along northbound Main St. V/C=.68, LOS=C
6. Main at Broadway	-Northbound through and left turn movements along Main St.	-reallocate 7 seconds to protected northbound left and through movements from other phases. LOS=D, V/C=1.03
7. Broadway at Smith	-Eastbound through and left turn movements along Broadway	-create an exclusive eastbound left turn lane and convert an eastbound through lane into a shared use lane. -create a 10 second leading protected eastbound left turn phase, reallocate time. LOS=C, V/C=.93
8. Main at Graham	-Northbound left turn from Main St. to Graham Ave.	-reallocate 5 seconds to protected northbound left turn phase from southbound movements. V/C=.87, LOS=D

For Garry St. traffic, the closure of Graham Ave. could further aggravate the operation of intersections forecast to experience difficulties, assuming Winnipeg Square is the desired parking location. Garry St. traffic would require access through both Portage Ave. at Main St., and Graham Ave. at Main St. intersections to arrive at the parking facility's entrance. According to the intersection analysis, the Portage Ave. at Main St. intersection is projected to fail and the intersection at Graham Ave. at Main St. is forecast to operate at an optimum level of service D and consequently, additional traffic would only increase operating problems. Distribution of Garry St. traffic, to locations other than the Winnipeg Square facility, would generate minimal intersection impacts.

Development of the York-St. Mary Ave. extension could affect event-traffic circulation patterns from two directions. Firstly, some traffic using the Provencher Bridge may be channelled to intersections located south of Portage Ave. at Main St., namely St. Mary-York Ave. intersections at Main St., and possibly those at Fort St. and Garry St. The impacts on these intersections would likely be minor since only the Provencher Bridge downtown approach is affected. Secondly, the extension could divert some Portage Ave. traffic originating from suburbs located west of downtown. Traffic diversion would most likely occur in the event that substantial amounts of on-site parking are provided at the Forks. Intersections along the York-St. Mary Ave. one-way couplet should have ample available capacity to accommodate traffic originating from these areas.

The York-St. Mary Ave. extension would, to some extent, reduce the impacts of traffic on the Portage Ave. at Main St. intersection. Presently, much of the crosstown traffic originating from either side of the Red River and using the Provencher Bridge passes through

the intersection. By extending the York-St. Mary Ave. couplet, some of this traffic may be redirected from the intersection, thus improving the operation of the intersection during peak arrival periods. Whether extension of the couplet would improve the operation of the intersection to acceptable standards would require further analysis.

5.3.3 Parking

There are in excess of 6,100 available parking spaces located within a 10 minute walk of the site, easily accommodating the projected arena parking demand of 4,800 vehicles. Unless substantial development occurs at the Forks, the site could not be integrated into the existing pedestrian walkway system.

Parking conflicts with arena patrons and those visiting the Forks area could develop. Several hundred free parking spaces are dedicated for Forks patrons. Arena spectators could take advantage of this situation and consequently create a parking problem. Enforcing a parking time limit, preferably two hours or less, could assist in discouraging arena patrons from parking at the Forks.

No surface parking spaces would be eliminated from the Forks site. Under existing conditions, development of an on-site parking structure would not be feasible. Presently, sufficient daytime parking is provided for Forks patrons.[3] The surface parking which is currently available is temporary and will be eliminated as development of the Forks area proceeds. To replace these spaces, the Forks' long range plan includes the construction of a parking structure located south of the York Ave. extension. Unless further office or

[3] Forks Renewal Corporation

commercial development is undertaken in the Forks vicinity, requiring substantial amounts of parking, an on-site facility would not benefit significantly from shared use. This location is also too far from downtown working populations and other generators to attract monthly and casual parkers.

5.3.4 Public Transit

Graham Ave., Portage Ave., and Main St. are all located within a 5-10 minute walk from the site and, as a result, virtually all downtown and crosstown transit routes can provide access to the site within reasonable walking distances. Future long range projects, such as the Southwest Transit Corridor, linking downtown to Fort Richmond and the University of Manitoba, and other regional corridors could increase the modal share of transit, due to their convergence at the Forks. However, these projects are not likely to be developed in the near future.

5.3.5 Pedestrian Accessibility

The site presently cannot be integrated into the weather-protected pedestrian walkway system. Although extensive development of the large tract of vacant land located north of the proposed York Ave. extension could, in the future, connect the area with the remainder of downtown, this is not likely to occur for many years. As a result, arena patrons would be required to walk outdoors. Outdoor pedestrian access is adequate although with some problem areas. Firstly, several hundred off-street surface parking lots are available north of the Pioneer-Water Ave. couplet. Virtually all of these lots are either poorly lit or not illuminated at all, which could create significant pedestrian apprehension. Secondly, access from parking areas located west of Main St. could also be improved. Presently, pedestrian access to the

arena from these areas could only be accomplished by either walking along Water Ave. to the north or York Ave. to the south, which could be inconvenient for some patrons. Access could be improved by constructing a pedestrian accessway beneath the CNR main line embankment at St. Mary Ave.

Significant pedestrian traffic would be expected through the smaller downtown commercial centres of the Winnipeg Square and Lombard Square concourses and, as a result, the potential for synergies and additional economic activities during pre-event periods would be enhanced. Several restaurants and nightclubs located in the Exchange District and in the vicinity of Portage Ave. at Main St. could also benefit from large pedestrian volumes.

5.4 Transportation Impacts: Lombard Ave. Site

5.4.1 Site Description

Most of the site consists of off-street surface parking lots, along with a portion of McDermot Ave, which would have to be closed. A large commercial building is situated at the southeast corner of the site at Lombard Ave. and Westbrook St., along with a smaller office structure located west of it. The site is within the Exchange District Historic Area and approximately a five minute walk from the Portage Ave./Main St. intersection. Site dimensions are approximately 400 feet along the east-west axis and 480 feet along the north-south axis.

5.4.2 Vehicular Accessibility

Five signalized intersections within the designated study area were projected to experience operating problems under existing signal, geometric and traffic conditions with other

intersections expected to operate at levels of service D or better (Table 7).

Table 7. Intersection Performance Summary-Lombard Ave. Site

	Background Traffic		Background and Arena Traffic	
Intersection	**Volume/ Capacity**	**LOS**	**Volume/ Capacity**	**LOS**
1. Fort at Graham	.31	B	*	*
2. Rorie at Lombard	.60	B	.89	D
3. Portage at Garry	.54	B	.69	D
4. Portage at Main	.97	D	*	*
5. Main at McDermot	.67	C	*	*
6. Portage at Smith	.68	B	*	*
7. Main at Graham	.62	B	*	*

* LOS is worse than F or Volume/Capacity is greater than 1.2

Intersections projected to experience operating deficiencies include:

i) Fort St. at Graham Ave.;

ii) Portage Ave. at Main St.;

iii) Main St. at McDermot Ave.;

iv) Smith St. at Portage Ave.;

v) Main St. at Graham Ave.

The operation of most of these intersections could be improved to acceptable standards

(LOS D) by implementing inexpensive traffic engineering techniques (Table 8). Portage Ave. at Main St. would be the sole intersection that would not be significantly improved. More comprehensive traffic management solutions would be required to significantly improve the intersection's performance.

Table 8. Intersection Operating Improvements-Lombard Ave. Site

Intersection	Problem(s)	Solution(s)
1. Fort at Graham	-Eastbound left turn from Graham Ave. to Fort St.	-reallocate 6 seconds of green time from northbound traffic to east-west traffic. LOS=C, V/C=.82
2. Portage at Main	-southbound Main St. through traffic -eastbound left turn from Portage Ave. to Main St. -westbound Portage Ave. through traffic	-no simple traffic engineering solutions, requires more complex traffic management strategies.
3. Main at McDermot	-southbound left turn from Main St. -northbound through movement along Main St.	-reallocate 6 seconds of green time to protected left turn phase from north-south movements. -remove parking along east side of Main St. north of McDermot. LOS=C, V/C=.70
4. Smith at Portage	-eastbound left turn from Portage Ave. to Smith St.	-provide a lagging 18 seconds protected left turn phase for eastbound traffic, reallocate time from east-west phase. LOS=C, V/C=.83
5. Main at Graham	-southbound left turn from Main St. to Graham Ave.	-reallocate 5 seconds to protected southbound left turn from north-south movements. V/C=.77, LOS=C

The eastern portion of McDermot Ave. between Rorie St. and Steven Juba Park would have to be closed. In this area, McDermot Ave. does not carry substantial volumes of through traffic and primarily provides access to several off-street surface parking lots. No significant

disruptions in downtown traffic circulation patterns would occur.

Similar to the other sites, both the York-St. Mary Ave. extension and the Graham Ave. transit mall would alter event-traffic circulation patterns. The York-St. Mary Ave. extension could redirect some Provencher Bridge traffic to intersections located south of Portage Ave. at Main St., specifically Main St. intersections at York-St. Mary Ave. As only one downtown approach is affected, any impacts would likely be minimal. The extension could also redirect some crosstown traffic from Portage Ave., thereby alleviating some of the congestion on the Portage Ave. at Main St. intersection. Further traffic analysis would be required to determine whether this project would allow the intersection to operate at an acceptable level of service during arena event-arrival periods.

The development of the Graham Ave. transit mall would generate small intersection impacts. Parking facilities on or near Graham Ave. are generally located along the boundary of the site's 10 minute parking zone. Based on event-traffic circulation projections, Smith St. traffic would be most affected, primarily involving access to the Winnipeg Square parking facility. Access to the Winnipeg Square parking facility for Smith St. traffic could be accomplished by entering Fort St. from either York Ave. or Broadway. Minimal impacts on Fort St. intersections would be expected. The availability of large parking facilities north of Portage Ave and within a 10 minute walk of the site, including those at the TD Centre and at Smith St. at Ellice Ave, would reduce the overall demand for parking south of Portage Ave., particularly at Winnipeg Square.

5.4.3 Parking

There are approximately 6,200 available parking spaces within a 10 minute walk of the site, easily accommodating the arena's projected parking demand. The Lombard Ave. location is adjacent to the existing downtown pedestrian walkway system and could possibly connect to it. If so, the large parking facilities in the Portage Ave. at Main St. area are currently connected to the walkway, potentially offering many arena patrons comfortable access during the winter for both pre-game and post-game periods (Table 9).

Table 9. Walkway Connected Parking Facilities-Lombard Ave. Site

Parking Location	Total Spaces
1. Winnipeg Square	986
2. TD Centre	819
3. Lombard Ave. Garage	567

Parking conflicts with the Centennial Concert Hall, Pantages Theatre, Manitoba Theatre Centre and other entertainment facilities, located in this area, would occur. However, the conflicts between these facilities and a Lombard Ave. arena would likely be minimal. Most arena spectators would be expected to park in facilities located south of Market Ave., while most patrons to these other facilities generally park north of Market Ave. Some competition for parking spaces would ensue between Market Ave. and Bannatyne Ave., and because there are relatively few available spaces in this area, minor parking problems would be forecast.

Approximately 400 off-street surface parking spaces would be removed, which could be replaced by an on-site facility. The attributes of the local street system for such a structure are

acceptable.[4] This location could offer shared-use potential with displaced parkers, arena tenants and management personnel using the facility during daytime working hours, and arena patrons parking during evenings. A traffic impact study should be undertaken in the event an on-site facility with significant amounts of parking is considered for this site.

5.4.4 Public Transit

The Lombard Ave. site is approximately a five minute walk from Portage Ave. at Main St., providing close access to most downtown and crosstown transit routes. The other major concentrated area of downtown transit services, Graham Ave., is located within a 10 minute walk. This location capitalizes on the existing downtown transit system. Many spectators using transit could access the arena using portions of the pedestrian walkway, namely Winnipeg Square and the Portage Ave. at Main St. concourse, which are easily accessible from virtually all downtown and crosstown transit routes.

Proposed facilities in Winnipeg's long range transit plans, such as the Southwest Transit Corridor and other regional busways, could increase the modal share of public transit to arena events at a Lombard Ave. site. However, these projects are not expected to be developed in the near future.

5.4.5 Pedestrian Accessibility

Almost 2,500 parking spaces situated in the vicinity of Portage Ave. and Main St. are connected to the existing pedestrian walkway and could be available during both pre-game and post-game periods. This would provide many spectators access to the arena in a safe, climate

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[4] Delcan. A Study of Parking in Downtown Winnipeg, August 1987, p.131

controlled, environment. Outdoor pedestrian access would be reasonably good with the exception of the large number of inadequately illuminated off-street surface parking spaces located east of the site and north of the Water-Pioneer Ave. couplet. The site's parking zone boundary is close to the area known as the "Main St. Strip", an area perceived to be unsafe at night, but few arena spectators would probably park in that area.

Significant pedestrian traffic would be expected through the Winnipeg Square and Lombard Square commercial concourses, thus enhancing the potential for synergies and additional economic activities during pre-game periods. The combination of large numbers of pedestrians and the concentration of nightclubs and restaurants in the Exchange District would also offer considerable potential for generating post-event activities.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS

6.1 Summary

Table 10 is a summary of the transportation impacts associated with each arena site.

Table 10. Transportation Impacts Summary

	Arena Sites		
Criteria	**Convention Centre**	**Forks**	**Lombard Ave.**
1. Vehicular Accessibility	Very Good	Good	Good
2. Parking	Very Good	Fair	Very Good
3. Public Transit	Good	Good	Very Good
4. Pedestrian Accessibility	Very Good	Fair	Good

6.1.1 Vehicular Accessibility

Evaluation of vehicular accessibility was based on the following criteria:

A) **Very Good.**

i) Most of the intersections within the designated study area would, or could be designed to, function at a minimum LOS B.

ii) Impacts from the re-routing of daytime traffic, on residential neighbourhoods during event-arrival periods, and from long-range projects were examined and assessed.

B) **Good.**

i) Most of the intersections within the designated study area would, or could be designed to, function at a minimum LOS C.

ii) Impacts from the re-routing of daytime traffic, on residential neighbourhoods during event-arrival periods, and from long-range projects were examined and assessed.

C) **Fair.**

i) Most of the intersections within the designated study area would, or could be designed to, function at a minimum LOS D.

ii) Impacts from the re-routing of daytime traffic, on residential neighbourhoods during event-arrival periods, and from long-range projects were examined and assessed.

D) **Poor.**

i) Most of the intersections within the designated study area would **not**, or could **not** be designed to, function at a minimum LOS D.

ii) Impacts from the re-routing of daytime traffic, on residential neighbourhoods during event-arrival periods, and from long-range projects were examined and assessed.

Winnipeg Convention Centre Site.

This site was evaluated as **Very Good** in terms of vehicular accessibility, based on the following factors:

1) Most intersections analyzed would be expected to function at LOS B, or could be designed to function at this level.

2) Closing Carlton St. between York Ave. and Broadway would alter local circulation

patterns, but not to the extent of significantly affecting the operations of nearby intersections.

3) Extending the York-St. Mary Ave. one-way couplet would not generate any significant circulation changes, or adverse impacts, on intersection operations by event traffic. Redirection of some crosstown Portage Ave. traffic to the couplet should easily be accommodated by removing parking along on at least one side of both York Ave. and St. Mary Ave.

4) Development of the Graham Ave. transit mall could reduce some intersection levels of service in the arena vicinity. Removal of parking along some sections of either York Ave. and St. Mary Ave., and possibly parking along some north-south one-way streets, should provide sufficient capacity to accommodate redirected event traffic.

5) Impacts of event traffic on the residential area south of Broadway could occur, but may be alleviated by implementing parking restrictions, to discourage arena patrons.

Forks Site

This site was evaluated as **Good** in terms of vehicular accessibility based on the following factors:

1) Most of the intersections analyzed would be expected to function at LOS C, or could be designed to function at this level.

2) The York-St. Mary Ave. extension is not expected to significantly affect event-traffic patterns, except in the event substantial amounts of on-site parking are provided. Redirection of some crosstown traffic from Portage Ave. to the couplet should alleviate some of the congestion at Portage Ave. at Main St., during event-arrival periods.

3) The Graham Ave. transit mall would not significantly affect event-traffic circulation

patterns.

Lombard Ave. Site

This site was evaluated as **Good** in terms of vehicular accessibility based on the following factors:

1) Most of the intersections analyzed would be expected to function at LOS C, or could be designed to function at this level.

2) Closing McDermot Ave. between Rorie St. and Stephen Juba Park would not affect downtown-traffic circulation patterns.

3) The St. Mary-York Ave. extension would not be expected to significantly alter event-traffic circulation patterns. Redirected crosstown traffic from Portage Ave. to the couplet should alleviate some of the congestion at Portage Ave. at Main St. during event-arrival periods.

4) Development of the Graham Ave. transit mall would have minor impacts on event-traffic circulation patterns.

6.1.2 Parking

Evaluation of parking was based on the following criteria:

A) **Very Good.**

i) Minimum requirements for arena parking demand are satisfied.

ii) Minor, infrequent, or no parking conflicts with other downtown activity centres are forecast.

iii) Potential for on-site parking facilities, and connections to other major downtown parking facilities through the enclosed pedestrian walkway, are available.

B) **Good.**

i) Minimum requirements for arena parking demand are satisfied.

ii) Minor, infrequent, or no parking conflicts with other downtown activity centres are forecast.

iii) Potential for either on-site parking facilities **or** connections to other major downtown parking facilities through the enclosed pedestrian walkway is available.

C) **Fair.**

i) Minimum requirements for parking demand are satisfied.

ii) Minor, infrequent, or non-existent conflicts with other downtown activity centres are forecast.

iii) Minimal on-site potential and an absence of enclosed pedestrian connections to other major downtown parking facilities through the enclosed pedestrian walkway system is available.

D) **Poor.**

i) Minimum requirements for arena parking demand are not satisfied.

Winnipeg Convention Centre Site

This site was evaluated as **Very Good** in terms of parking, based on the following factors:

1) An ample supply of parking is available for hockey games within a 10 minute walk.

2) Possible connections to several hundred parking spaces through the pedestrian walkway system are available, and the potential exists for an on-site, shared-use facility.

3) Parking conflicts with other downtown activity generators would occur, but are likely

to be infrequent.

Forks Site

This site was evaluated as **Fair** in terms of parking, based on the following factors:

1) An ample parking supply for hockey games is available within a reasonable walking distance.

2) Major downtown parking facilities could not be connected to this site through the pedestrian walkway system, and development of an on-site facility is not feasible under existing conditions, due to the absence of significant shared-use potential.

Lombard Ave. Site

This site was evaluated as **Very Good** in terms of parking, based on the following factors:

1) Ample parking supply for hockey games is available within a 10 minute walk.

2) Possible connections to several hundred parking spaces through the pedestrian walkway system are available, and the potential exists for an on-site, shared-use facility.

3) Parking conflicts with other downtown activity generators would occur, but are expected to be minor.

6.1.3 Public Transit

Evaluation of public transit was based on the following criteria:

A) **Very Good**.

i) All or most downtown and crosstown transit routes are within a 10 minute walk of the site, with over half available within a five minute walk.

ii) Future transit facilities have the potential to significantly increase transit's modal share

to arena events.

B) **Good.**

i) All or most downtown and crosstown transit routes are available within a 10 minute walk of the site, with some routes available within a five minute walk.

ii) Future transit facilities have the potential to significantly increase transit's modal share to arena events.

C) **Fair.**

i) All or most downtown and crosstown transit routes are available within a 10 minute walk of the site.

ii) Future transit facilities are not expected to have a major impact.

D) **Poor.**

i) All or most downtown and crosstown transit routes require a walking time in excess of 10 minutes.

ii) Future transit facilities are not expected to have a major impact.

Winnipeg Convention Centre Site

This site was evaluated as **Good** in terms of public transit based on the following factors:

1) Downtown transit services along Graham Ave. and Portage Ave. are located within a 5-10 minute walk.

2) Development of regional transit busways, along with the Graham Ave. transit mall, could increase the use of transit to arena events.

Forks Site

This site was evaluated as **Good** in terms of public transit based on the following factors:

1) Virtually all downtown and crosstown routes are available between a 5-10 minute walk of the site.

2) Development of the Southwest Transit Corridor, and other regional busways, could increase transit use to arena events.

Lombard Ave. Site

This site was evaluated as **Very Good** in terms of public transit based on the following factors:

1) It is located less than five minutes (walking) from the intersection of Portage Ave. at Main St., where most downtown transit routes focus. The other concentrated area of transit services, Graham Ave., is located within a 10 minute walk of the site.

2) Development of the city's transit busways could increase the modal split of transit to arena events.

6.1.4 Pedestrian Accessibility

Evaluation of pedestrian accessibility was based on the following criteria:

A) **Very Good.**

i) Outdoor access is provided primarily along well lit streets, offering direct site accessibility.

ii) Significant volumes of pedestrian traffic could be expected through major commercial areas.

iii) Potential for enclosed pedestrian walkway connections is available.

B) **Good.**

i) Outdoor access is provided primarily along well lit streets, offering direct site accessibility.

ii) Reduced pedestrian traffic could be expected through major commercial areas.

iii) Reduced potential for enclosed pedestrian walkway connections for spectator access is available.

C) **Fair.**

i) Outdoor access is provided primarily along well lit streets, offering direct site accessibility.

ii) No potential for enclosed pedestrian access is offered, along with small volumes of pedestrian traffic, through commercial areas.

D) **Poor.**

i) Substantial amounts of outdoor access can be expected along circuitous routes, and through poorly lit streets and/or surface parking lots.

Winnipeg Convention Centre Site

This site was evaluated as **Very Good** in terms of pedestrian accessibility based on the following factors:

1) Integration into the existing pedestrian walkway is possible.

2) Outdoor pedestrian access would generally occur along the well lit streets, located north of the site, towards Portage Ave.

3) Large pedestrian volumes through both the Eaton department store and Eaton Place

shopping centre and, smaller volumes through Portage Place and The Bay department store, could be expected, if walkway operations permit. The concentration of restaurants in the vicinity of the site could also benefit from the large volumes of pedestrian traffic.

Forks Site

This site was evaluated as **Fair** in terms of pedestrian access based on the following factors:

1) Under current development conditions, there exists no possibility for integrating the site with the existing pedestrian walkway system.

2) Exclusive outdoor access would be required and, although generally good, it possesses some shortcomings, including:

a) the presence of poorly lit parking lots located north of the Water-Pioneer Ave. couplet;

b) no direct site access exists between York Ave. and Graham Ave from Main St. and parking areas further to the west.

3) Significant pedestrian traffic could be expected through the smaller downtown concourses of Winnipeg Square and Lombard Square. Some pedestrian traffic could be expected in the Exchange District, where it may benefit the nightclubs in the area.

Lombard Ave. Site

This site was evaluated as **Good** in terms of pedestrian accessibility based on the following factors:

1) Integration into the existing walkway system could be accomplished, which would offer many patrons climate-controlled access.

2) Outdoor access would generally occur along well lit streets, the exception being the surface parking lots located further east of the site along the Water-Pioneer Ave. couplet.

3) Substantial pedestrian traffic through smaller downtown commercial areas of both the Winnipeg Square and Lombard Square concourses would be expected. Large pedestrian volumes could also benefit the nightclubs and restaurants in the Exchange District.

6.2 Recommendations

Although the Forks site is good when compared to the other two sites in terms of vehicular accessibility and public transit, it does not compare favourably, in terms of parking or pedestrian accessibility, due largely to the Forks' isolation from the developed downtown core. It is recommended that, although acceptable in terms of transportation, the Forks site should not be pursued unless further evaluation of such issues as land use compatibility and urban design, just to mention two, dictates otherwise.

Both the Lombard Ave. and Winnipeg Convention Centre sites are located within the developed downtown Winnipeg core and, as a result, one site is **not** significantly better than the other, in terms of transportation. Each site is quite comparable to one another in terms of parking and pedestrian accessibility. Access to public transit routes is more favoured at the Lombard Ave. site, while traffic operations are favoured at the Winnipeg Convention Centre site.

It is expected that at least three times as many arena patrons will use the automobile over public transit and, as a result, consideration of vehicular accessibility takes on greater importance than public transit. This practicum recommends that, in terms of transportation, a downtown arena would be best suited at the site adjacent to the Winnipeg Convention Centre.

It should be reiterated that this practicum does not provide a comprehensive planning

analysis of all the factors that should be taken into consideration. Although the issue of transportation is very important when considering the development of large regional facilities in a downtown environment, other issues, such as urban design, land use compatibility, preservation of historic assets, displacement of existing uses, and utility servicing, are all important, and must be addressed. As an example, the Lombard Ave. site would work reasonably well in terms of transportation, but the location within the historic Exchange District could possibly disqualify it based on urban design and other factors.

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Bradley Centre Corporation, Milwaukee, Wisconsin

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Hamilton Entertainment And Convention Facilities, Hamilton, Ontario

City Of Orlando Transportation Planning Bureau, Orlando, Florida

Orlando Centroplex, Orlando, Florida

City Of Phoenix Traffic Department, Phoenix, Arizona

America West Arena, Phoenix, Arizona

Winnipeg Convention Centre

City Of Winnipeg Planning Department

City Of Winnipeg Transit Department

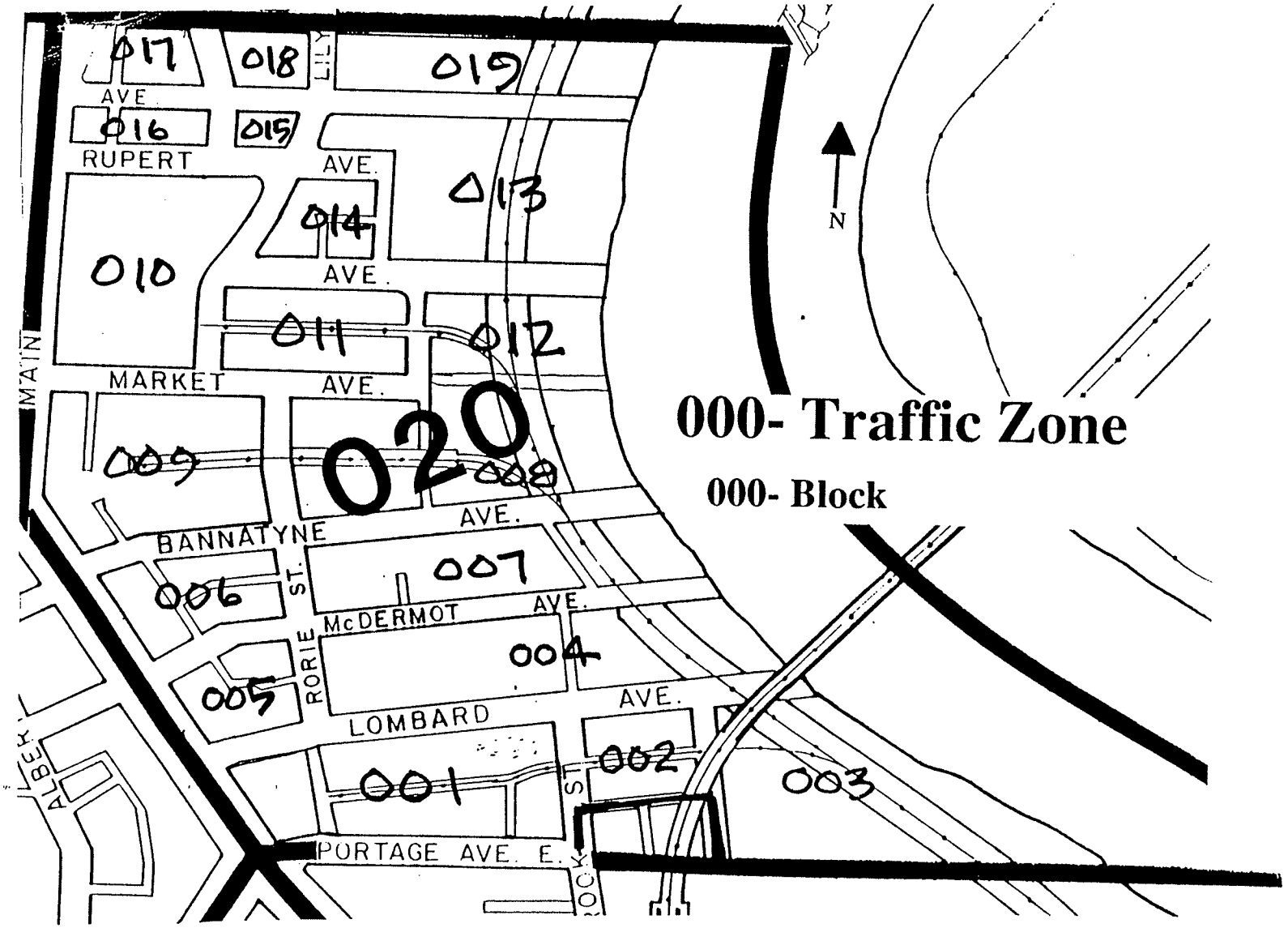
Derek Belsham, DS-Lea Consultants Ltd., Winnipeg

Fred Corey, City Of Winnipeg Streets And Transportation Department

Jack Harper, Faculty Of Physical Education And Recreational Studies, University Of Manitoba

APPENDIX 1

DOWNTOWN BLOCKS AND PARKING SUPPLIES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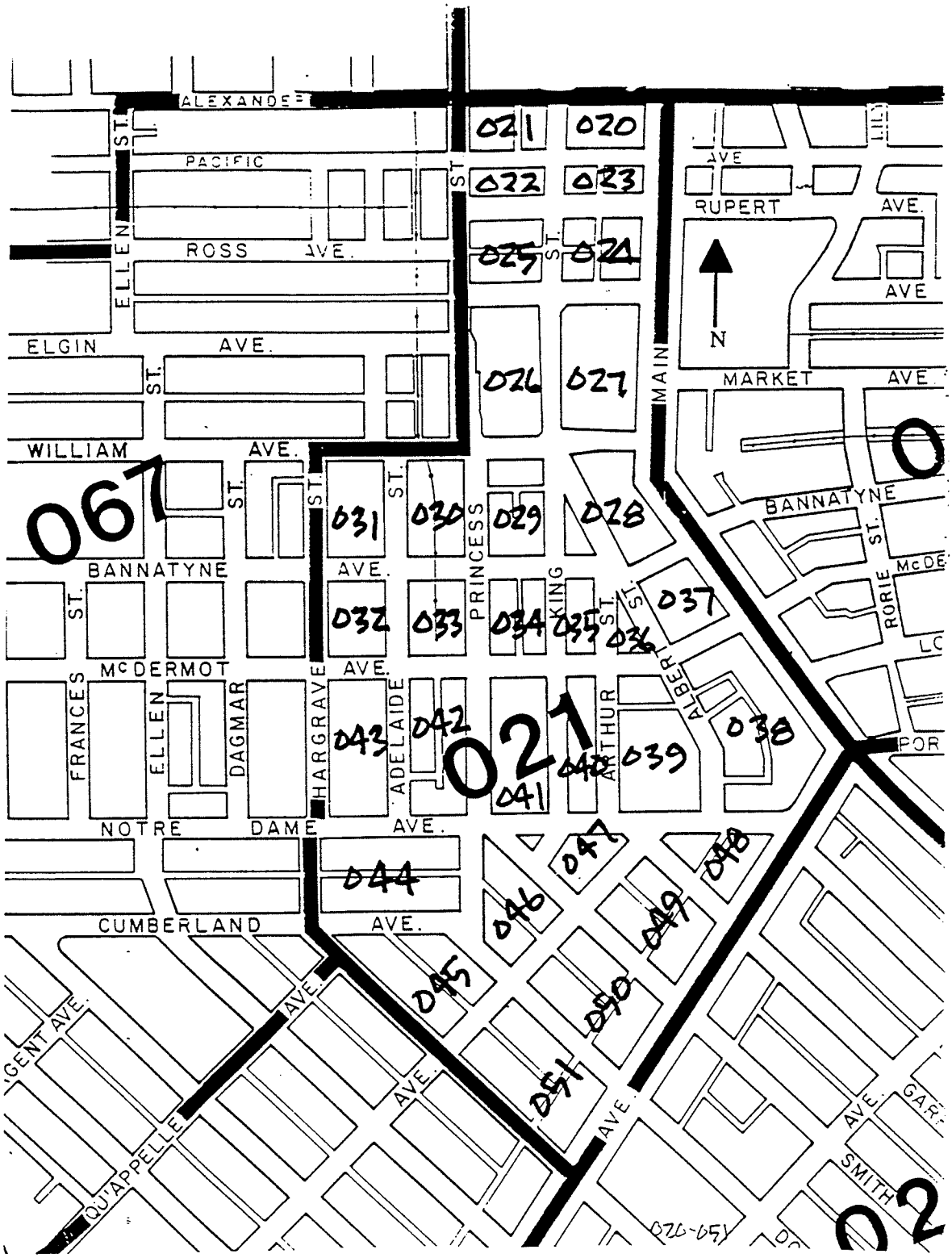
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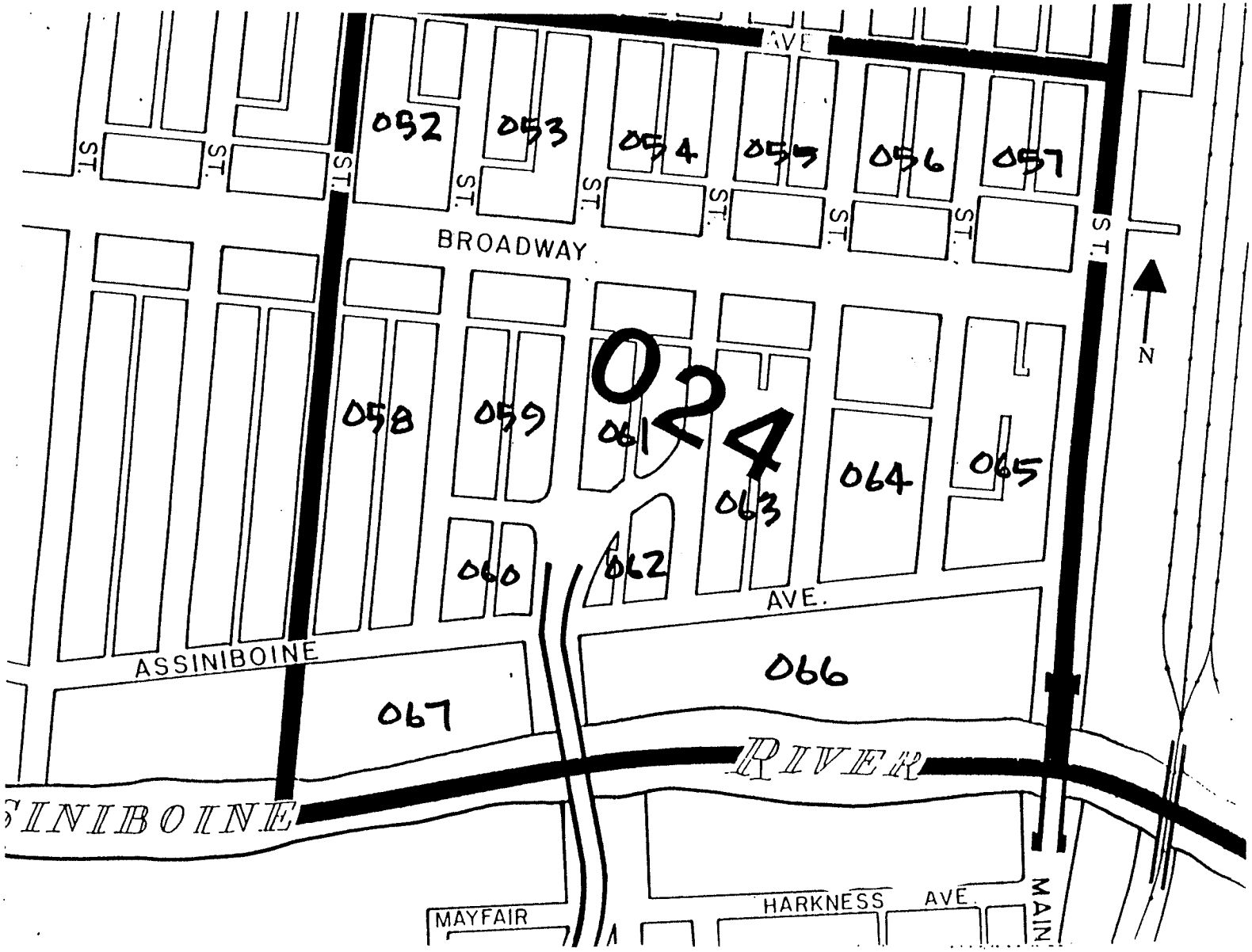
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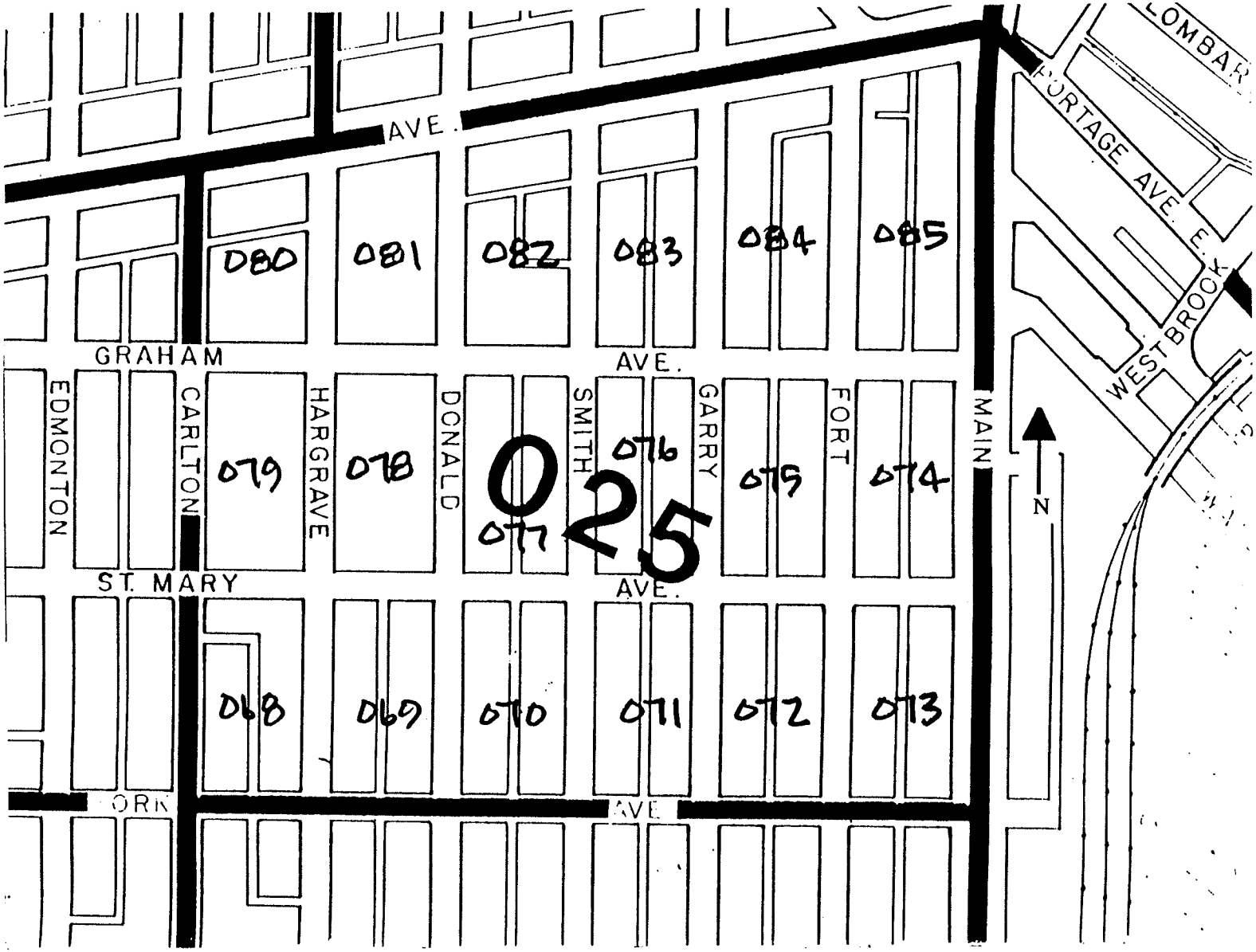
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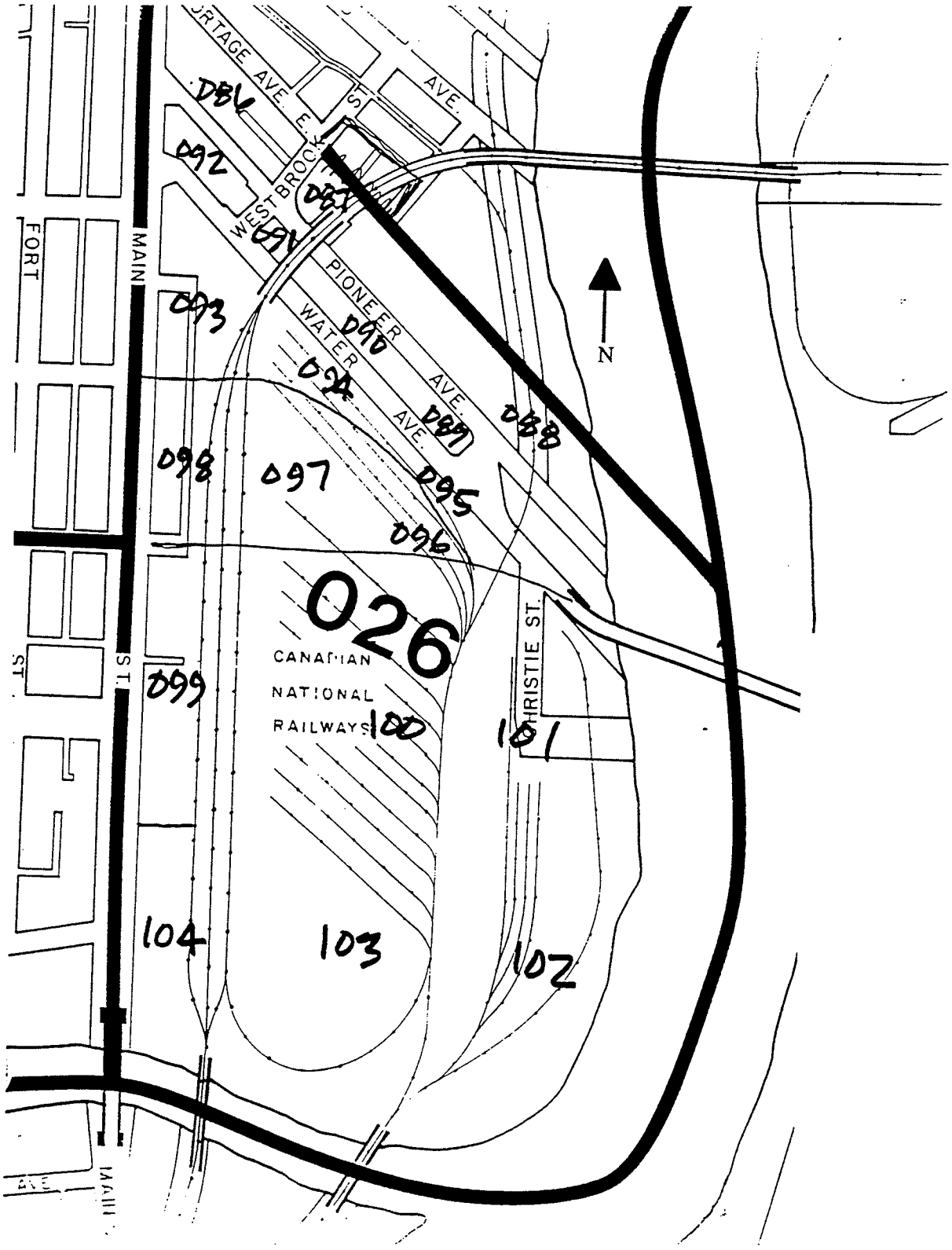
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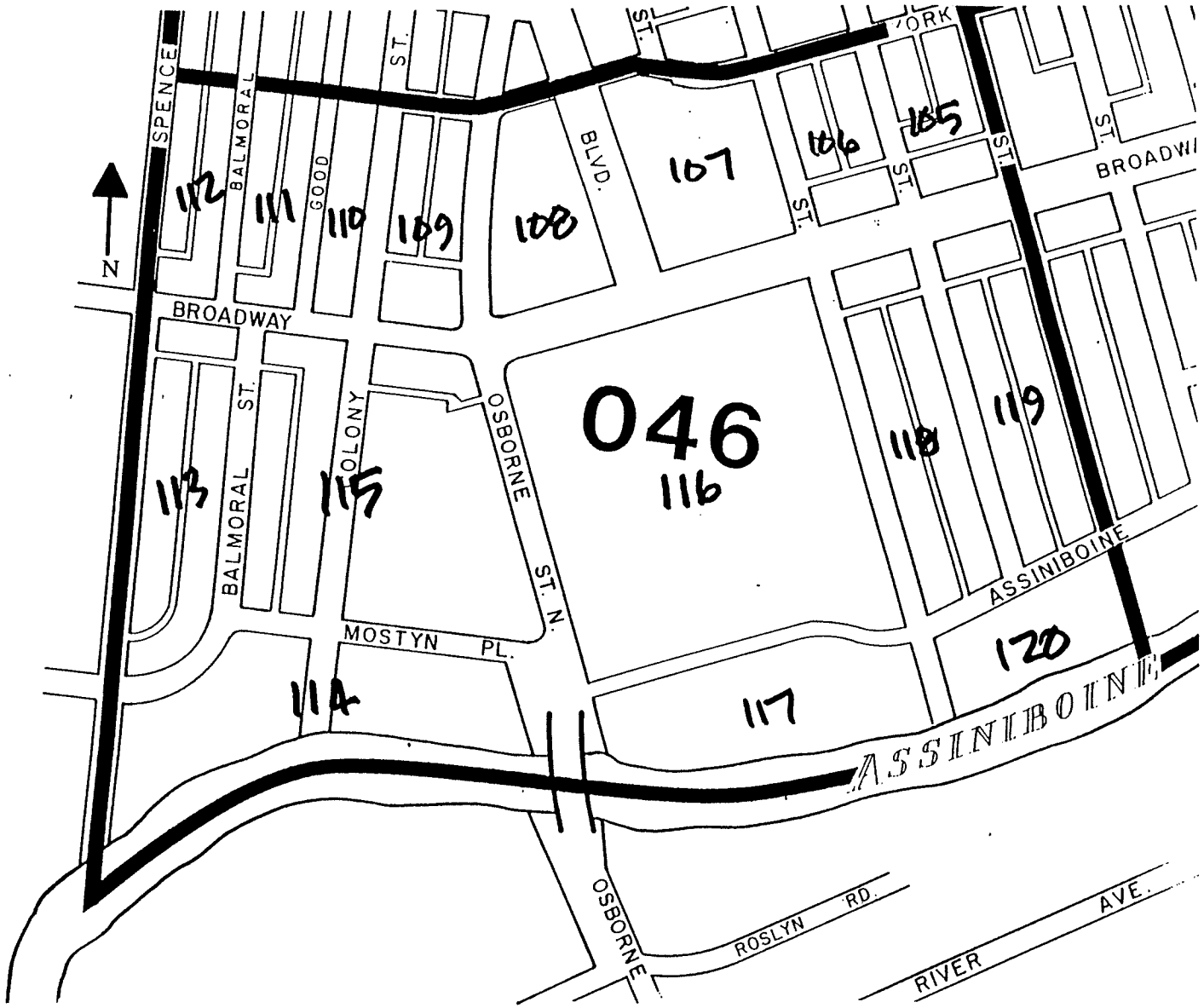
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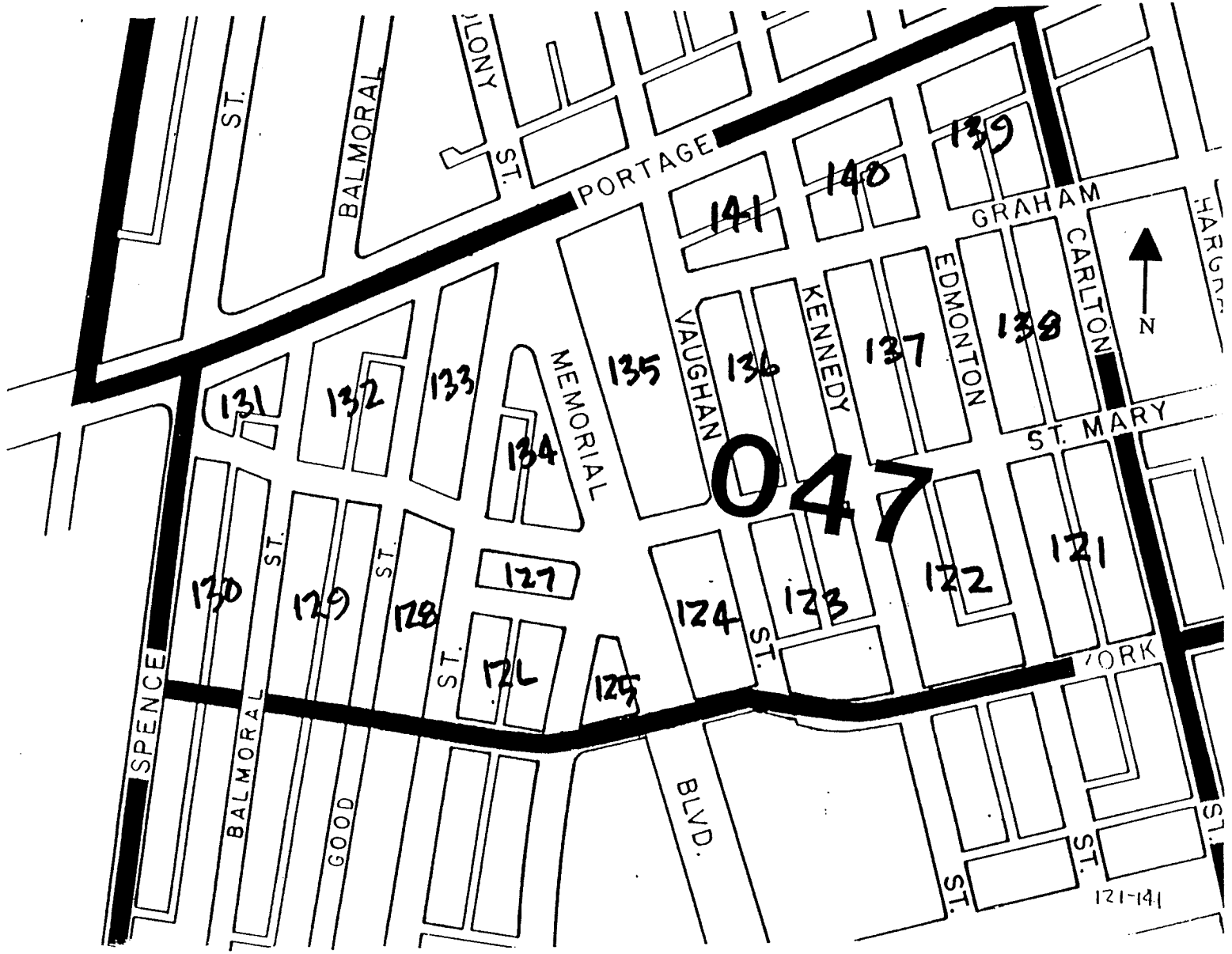
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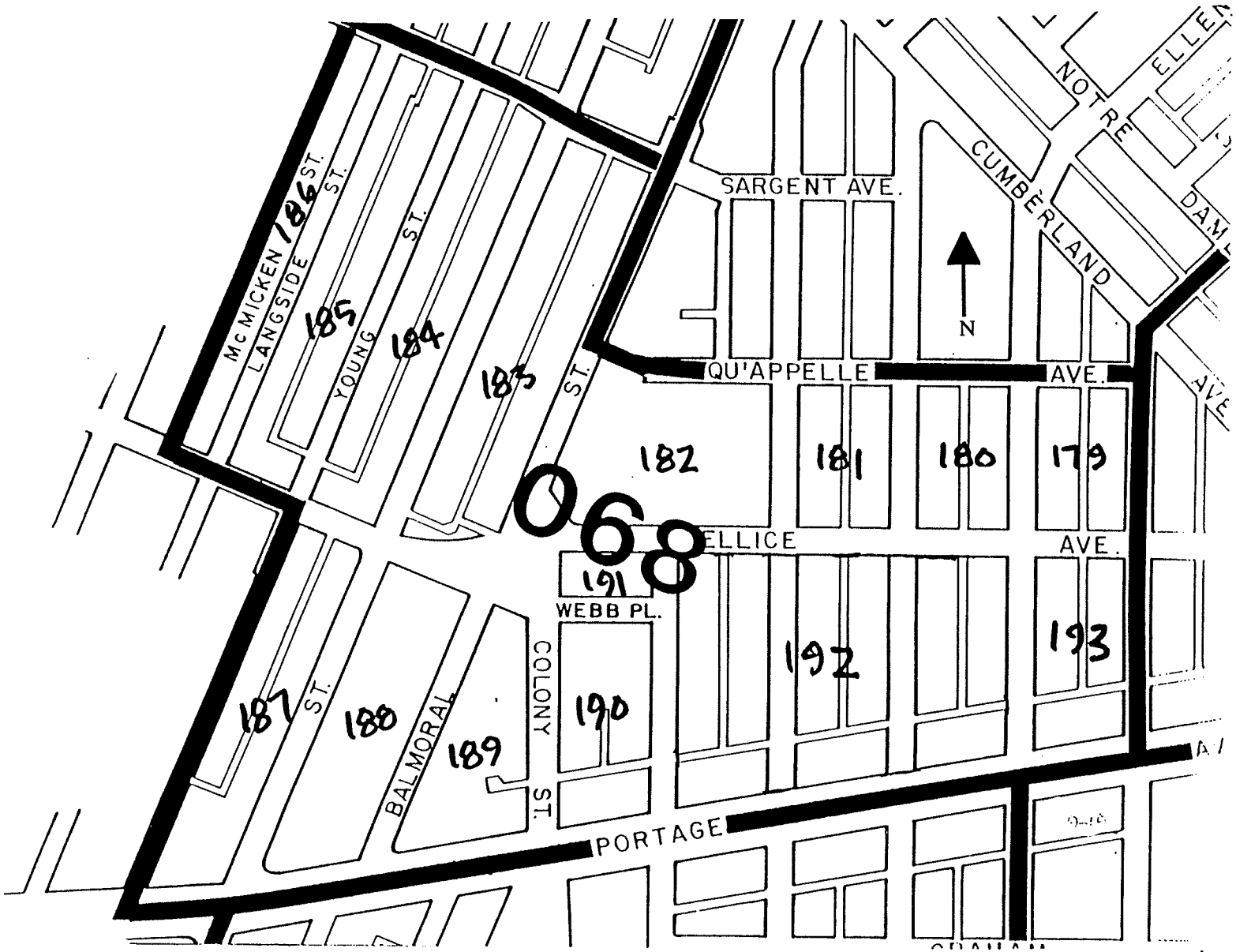
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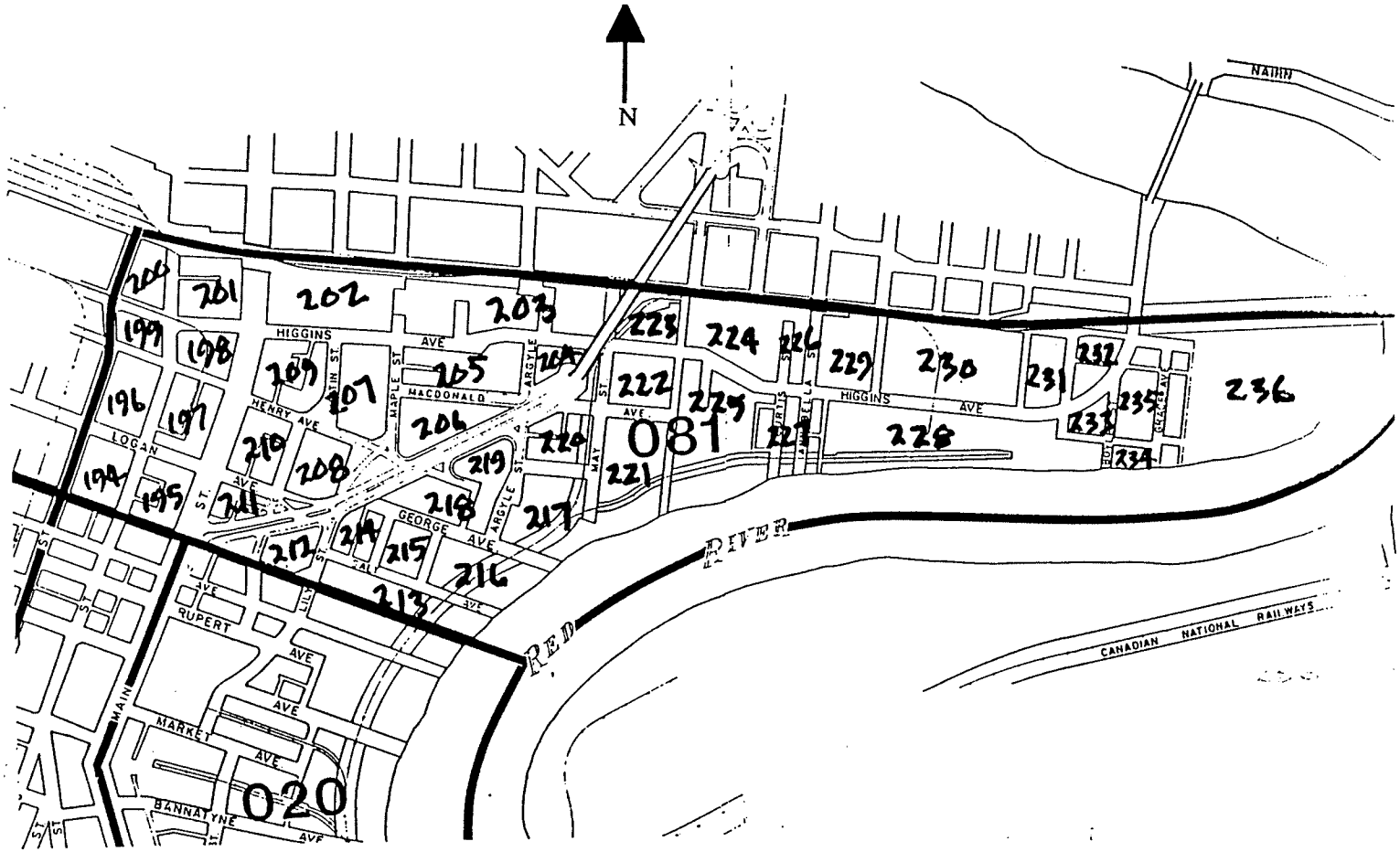
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DOWNTOWN TRAFFIC STUDY

PARKING by TYPE and BLOCK

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BLOCK NO.	TRAFFIC ZONE	SURFACE			STRUCTURE			TOTAL		
		COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
001	020	181	0	181	560	0	560	741	0	741
002	020	158	0	158	0	0	0	158	0	158
003	020	102	0	102	0	0	0	102	0	102
004	020	387	0	387	0	0	0	387	0	387
005	020	4	0	4	220	0	220	224	0	224
006	020	60	0	60	24	0	24	84	0	84
007	020	233	0	233	7	0	7	240	0	240
008	020	183	0	183	55	0	55	238	0	238
009	020	133	0	133	17	0	17	150	0	150
010	020	0	0	0	125	0	125	125	0	125
011	020	70	0	70	10	0	10	80	0	80
012	020	15	0	15	0	0	0	15	0	15
013	020	65	0	65	0	0	0	65	0	65
014	020	74	0	74	0	0	0	74	0	74
015	020	2	0	2	0	0	0	2	0	2
016	020	102	0	102	0	0	0	102	0	102
017	020	35	0	35	0	0	0	35	0	35
018	020	27	0	27	0	0	0	27	0	27
019	020	39	0	39	0	0	0	39	0	39
	TOTAL	1,870	0	1,870	1,018	0	1,018	2,888	0	2,888
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023	021	15	0	15	0	0	0	15	0	15
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041	021	61	0	61	0	0	0	61	0	61

DOWNTOWN TRAFFIC STUDY

PARKING by TYPE and BLOCK

1991

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BLOCK NO.	TRAFFIC ZONE	SURFACE			STRUCTURE			TOTAL		
		COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
042	021	39	0	39	0	0	0	39	0	39
043	021	76	0	76	0	0	0	76	0	76
044	021	194	0	194	0	0	0	194	0	194
045	021	89	0	89	0	0	0	89	0	89
046	021	83	0	83	0	0	0	83	0	83
047	021	110	0	110	0	0	0	110	0	110
048	021	4	0	4	0	0	0	4	0	4
049	021	8	0	8	2	0	2	10	0	10
050	021	3	0	3	404	0	404	407	0	407
051	021	115	0	115	3	0	3	118	0	118
	TOTAL	1,405	11	1,416	1,777	133	1,910	3,182	144	3,326
052	024	238	0	238	0	0	0	238	0	238
053	024	223	0	223	0	207	207	223	207	430
054	024	165	4	169	0	128	128	165	132	297
055	024	42	0	42	145	0	145	187	0	187
056	024	171	0	171	182	0	182	353	0	353
057	024	146	0	146	0	0	0	146	0	146
058	024	155	160	315	0	85	85	155	245	400
059	024	113	42	155	0	240	240	113	282	395
060	024	50	24	74	0	196	196	50	220	270
061	024	185	30	215	0	0	0	185	30	215
062	024	51	22	73	0	0	0	51	22	73
063	024	63	27	90	0	245	245	63	272	335
064	024	44	0	44	1,239	0	1,239	1,283	0	1,283
065	024	218	0	218	0	0	0	218	0	218
066	024	79	0	79	0	0	0	79	0	79
067	024	41	113	154	0	0	0	41	113	154
	TOTAL	1,984	422	2,406	1,566	1,101	2,667	3,550	1,523	5,073
068	025	0	0	0	512	0	512	512	0	512
069	025	289	0	289	65	0	65	354	0	354
070	025	157	0	157	401	0	401	558	0	558
071	025	63	63	126	0	0	0	63	63	126
072	025	187	0	187	0	0	0	187	0	187
073	025	105	4	109	324	0	324	429	4	433
074	025	129	0	129	120	0	120	249	0	249
075	025	65	0	65	207	0	207	272	0	272
076	025	13	0	13	0	0	0	13	0	13
077	025	20	0	20	499	0	499	519	0	519
078	025	0	0	0	350	0	350	350	0	350
079	025	227	0	227	5	0	5	232	0	232

DOWNTOWN TRAFFIC STUDY

PARKING by TYPE and BLOCK

1991

C:\DTTRAFIC\DTSPAR91.WQ1/EGG

BLOCK NO.	TRAFFIC ZONE	SURFACE			STRUCTURE			TOTAL		
		COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
080	025	72	0	72	606	0	606	678	0	678
081	025	0	0	0	0	0	0	0	0	0
082	025	78	0	78	313	0	313	391	0	391
083	025	250	0	250	0	0	0	250	0	250
084	025	75	0	75	337	0	337	412	0	412
085	025	0	0	0	986	0	986	986	0	986
	TOTAL	1,730	67	1,797	4,725	0	4,725	6,455	67	6,522
086	026	150	0	150	0	0	0	150	0	150
087	026	117	0	117	0	0	0	117	0	117
088	026	443	0	443	0	0	0	443	0	443
089	026	40	0	40	0	0	0	40	0	40
090	026	156	0	156	0	0	0	156	0	156
091	026	28	0	28	0	0	0	28	0	28
092	026	80	0	80	0	0	0	80	0	80
093	026	0	0	0	0	0	0	0	0	0
094	026	0	0	0	0	0	0	0	0	0
095	026	0	0	0	0	0	0	0	0	0
096	026	0	0	0	0	0	0	0	0	0
097	026	0	0	0	0	0	0	0	0	0
098	026	151	0	151	0	0	0	151	0	151
099	026	79	0	79	0	0	0	79	0	79
100	026	0	0	0	0	0	0	0	0	0
101	026	0	0	0	0	0	0	0	0	0
102	026	0	0	0	0	0	0	0	0	0
103	026	982	0	982	0	0	0	982	0	982
104	026	115	0	115	0	0	0	115	0	115
	TOTAL	2,341	0	2,341	0	0	0	2,341	0	2,341
105	046	280	0	280	122	0	122	402	0	402
106	046	113	0	113	15	0	15	128	0	128
107	046	35	0	35	87	0	87	122	0	122
108	046	0	0	0	0	0	0	0	0	0
109	046	72	16	88	0	0	0	72	16	88
110	046	62	24	86	0	22	22	62	46	108
111	046	18	42	60	0	0	0	18	42	60
112	046	8	54	62	0	0	0	8	54	62
113	046	29	92	121	0	0	0	29	92	121
114	046	77	25	102	0	14	14	77	39	116
115	046	603	0	603	0	0	0	603	0	603
116	046	214	0	214	0	0	0	214	0	214
117	046	12	0	12	0	0	0	12	0	12

DOWNTOWN TRAFFIC STUDY

PARKING by TYPE and BLOCK

1991

C:\DTTRAFIC\DTSPAR91.WQ1/EGG

BLOCK NO.	TRAFFIC ZONE	SURFACE			STRUCTURE			TOTAL		
		COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
118	046	250	86	336	78	90	168	328	176	504
119	046	119	162	281	5	164	169	124	326	450
120	046	0	31	31	0	0	0	0	31	31
	TOTAL	1,892	532	2,424	307	290	597	2,199	822	3,021
121	047	0	0	0	600	0	600	600	0	600
122	047	155	8	163	82	0	82	237	8	245
123	047	49	4	53	476	0	476	525	4	529
124	047	0	0	0	0	0	0	0	0	0
125	047	0	0	0	0	0	0	0	0	0
126	047	87	2	89	0	0	0	87	2	89
127	047	51	2	53	0	0	0	51	2	53
128	047	18	55	73	0	29	29	18	84	102
129	047	3	39	42	0	0	0	3	39	42
130	047	0	70	70	0	0	0	0	70	70
131	047	22	0	22	0	0	0	22	0	22
132	047	0	0	0	270	0	270	270	0	270
133	047	60	0	60	0	0	0	60	0	60
134	047	23	0	23	0	0	0	23	0	23
135	047	0	0	0	800	0	800	800	0	800
136	047	137	1	138	4	0	4	141	1	142
137	047	163	0	163	386	0	386	549	0	549
138	047	73	0	73	195	0	195	268	0	268
139	047	69	0	69	1	0	1	70	0	70
140	047	5	0	5	0	0	0	5	0	5
141	047	11	0	11	2	0	2	13	0	13
	TOTAL	926	181	1,107	2,816	29	2,845	3,742	210	3,952
142	067	3	16	19	0	169	169	3	185	188
143	067	0	0	0	0	0	0	0	0	0
144	067	38	112	150	28	21	49	66	133	199
145	067	0	12	12	0	62	62	0	74	74
146	067	1	5	6	0	6	6	1	11	12
147	067	19	39	58	0	0	0	19	39	58
148	067	37	35	72	0	0	0	37	35	72
149	067	155	0	155	0	0	0	155	0	155
150	067	34	49	83	298	0	298	332	49	381
151	067	168	0	168	0	0	0	168	0	168
152	067	38	0	38	0	0	0	38	0	38
153	067	102	0	102	0	0	0	102	0	102
154	067	35	12	47	0	0	0	35	12	47
155	067	61	0	61	0	0	0	61	0	61

DOWNTOWN TRAFFIC STUDY

PARKING by TYPE and BLOCK

C:\DTTRAFIC\DTSPAR91.WQ1/EGG 1991

BLOCK NO.	TRAFFIC ZONE	SURFACE			STRUCTURE			TOTAL		
		COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
156	067	23	7	30	0	0	0	23	7	30
157	067	45	1	46	0	0	0	45	1	46
158	067	0	8	8	0	0	0	0	8	8
159	067	0	11	11	0	0	0	0	11	11
160	067	0	9	9	0	0	0	0	9	9
161	067	0	2	2	0	0	0	0	2	2
162	067	0	0	0	0	0	0	0	0	0
163	067	22	0	22	0	0	0	22	0	22
164	067	24	8	32	0	0	0	24	8	32
165	067	13	0	13	0	0	0	13	0	13
166	067	32	0	32	0	0	0	32	0	32
167	067	38	9	47	0	0	0	38	9	47
168	067	0	4	4	0	0	0	0	4	4
169	067	16	40	56	0	0	0	16	40	56
170	067	31	26	57	0	0	0	31	26	57
171	067	43	42	85	0	0	0	43	42	85
172	067	10	0	10	0	0	0	10	0	10
173	067	63	27	90	0	0	0	63	27	90
174	067	51	40	91	0	0	0	51	40	91
175	067	0	27	27	0	0	0	0	27	27
176	067	0	5	5	0	0	0	0	5	5
177	067	48	0	48	0	0	0	48	0	48
178	067	132	0	132	0	0	0	132	0	132
	TOTAL	1,282	546	1,828	326	258	584	1,608	804	2,412
179	068	179	0	179	0	0	0	179	0	179
180	068	43	0	43	0	0	0	43	0	43
181	068	49	42	91	0	50	50	49	92	141
182	068	25	0	25	100	0	100	125	0	125
183	068	0	132	132	0	0	0	0	132	132
184	068	37	123	160	0	0	0	37	123	160
185	068	14	87	101	0	6	6	14	93	107
186	068	2	37	39	0	0	0	2	37	39
187	068	0	0	0	0	0	0	0	0	0
188	068	60	0	60	24	0	24	84	0	84
189	068	102	0	102	400	0	400	502	0	502
190	068	106	0	106	162	0	162	268	0	268
191	068	22	0	22	0	105	105	22	105	127
192	068	96	0	96	1,069	540	1,609	1,165	540	1,705
193	068	5	0	5	0	0	0	5	0	5
	TOTAL	740	421	1,161	1,755	701	2,456	2,495	1,122	3,617

DOWNTOWN TRAFFIC STUDY

PARKING by TYPE and BLOCK

C:\DTTRAFIC\DTSPAR91.WQ1/EGG 1991

BLOCK NO.	TRAFFIC ZONE	SURFACE			STRUCTURE			TOTAL		
		COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
194	081	89	0	89	0	0	0	89	0	89
195	081	76	0	76	0	0	0	76	0	76
196	081	58	0	58	0	0	0	58	0	58
197	081	40	0	40	0	0	0	40	0	40
198	081	69	0	69	0	0	0	69	0	69
199	081	58	0	58	0	0	0	58	0	58
200	081	38	0	38	0	0	0	38	0	38
201	081	16	0	16	0	0	0	16	0	16
202	081	86	0	86	0	0	0	86	0	86
203	081	98	0	98	0	0	0	98	0	98
204	081	3	12	15	0	0	0	3	12	15
205	081	128	0	128	0	0	0	128	0	128
206	081	74	0	74	0	0	0	74	0	74
207	081	220	0	220	0	0	0	220	0	220
208	081	92	0	92	0	0	0	92	0	92
209	081	42	7	49	0	0	0	42	7	49
210	081	46	0	46	0	0	0	46	0	46
211	081	60	6	66	0	0	0	60	6	66
212	081	26	0	26	0	0	0	26	0	26
213	081	6	0	6	0	0	0	6	0	6
214	081	36	8	44	0	0	0	36	8	44
215	081	30	0	30	0	0	0	30	0	30
216	081	36	0	36	0	0	0	36	0	36
217	081	32	0	32	0	0	0	32	0	32
218	081	0	6	6	0	0	0	0	6	6
219	081	20	0	20	0	0	0	20	0	20
220	081	12	0	12	0	0	0	12	0	12
221	081	20	0	20	0	0	0	20	0	20
222	081	40	10	50	0	0	0	40	10	50
223	081	70	0	70	0	0	0	70	0	70
224	081	58	0	58	0	0	0	58	0	58
225	081	71	0	71	0	0	0	71	0	71
226	081	16	0	16	0	0	0	16	0	16
227	081	0	0	0	0	0	0	0	0	0
228	081	164	0	164	0	0	0	164	0	164
229	081	20	0	20	0	0	0	20	0	20
230	081	103	0	103	0	0	0	103	0	103
231	081	26	0	26	0	0	0	26	0	26
232	081	56	0	56	0	0	0	56	0	56
233	081	0	6	6	0	0	0	0	6	6
234	081	0	0	0	0	0	0	0	0	0
235	081	6	4	10	0	0	0	6	4	10
236	081	52	4	56	0	0	0	52	4	56

DOWNTOWN TRAFFIC STUDY

PARKING by TYPE and BLOCK

1991

C:\DTTRAFIC\DTSPAR91.WQ1/EGG

BLOCK NO.	TRAFFIC ZONE	SURFACE			STRUCTURE			TOTAL		
		COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
	TOTAL	2,193	63	2,256	0	0	0	2,193	63	2,256
GRAND TOTAL		16,363	2,243	18,606	14,290	2,512	16,802	30,653	4,755	35,408

ZONAL SUMMARY 1991

	SURFACE			STRUCTURE			TOTAL		
	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
TRAFFIC ZONE 020	1,870	0	1,870	1,018	0	1,018	2,888	0	2,888
TRAFFIC ZONE 021	1,405	11	1,416	1,777	133	1,910	3,182	144	3,326
TRAFFIC ZONE 024	1,984	422	2,406	1,566	1,101	2,667	3,550	1,523	5,073
TRAFFIC ZONE 025	1,730	67	1,797	4,725	0	4,725	6,455	67	6,522
TRAFFIC ZONE 026	2,341	0	2,341	0	0	0	2,341	0	2,341
TRAFFIC ZONE 046	1,892	532	2,424	307	290	597	2,199	822	3,021
TRAFFIC ZONE 047	926	181	1,107	2,816	29	2,845	3,742	210	3,952
TRAFFIC ZONE 067	1,282	546	1,828	326	258	584	1,608	804	2,412
TRAFFIC ZONE 068	740	421	1,161	1,755	701	2,456	2,495	1,122	3,617
TRAFFIC ZONE 081	2,193	63	2,256	0	0	0	2,193	63	2,256
GRAND TOTAL	16,363	2,243	18,606	14,290	2,512	16,802	30,653	4,755	35,408

Table 11. Available Parking-Winnipeg Convention Centre Arena Site

Block #	# Deductions	% Spaces Available	Total Available Spaces	6:30-7:30 P.M. Available Spaces
053	120	91	94	90
054	10	86	133	127
055	0	80	150	143
056	0	30	106	92
057	20	75*	95	90
063	0	20	13	11
068	0	58	297	277
069	0	72	255	241
070	30	60	317	297
071	24	85*	33	31
072	56	80*	105	100
073	23	80	325	309
077	20	86	429	409
078	0	50*	175	161
079	37	46	90	82
080	17	64	423	397
106	45	85*	71	68
107	0	85*	104	99
121	0	80	480	456
122	11	90	203	194
123	0	92	483	462
135	0	74	592	560
136	68	65	47	44
137	54	86	426	406
138	15	81	205	195
139	0	59	41	38
192	0	73	780	737
Totals			**6,472**	**6,116**

*Estimated

Table 12. Available Parking-Forks Arena Site

Block #	# Deductions	% Spaces Available	Total Available Spaces	6:30-7:30 P.M. Available Spaces
001	0	77	571	541
002	0	85	134	128
003	56	91	42	38
004	0	91	352	337
054	10	86	133	127
055	0	80	150	143
056	0	30	106	92
057	20	75*	95	90
064	44	50*	620	570
065	23	64	125	117
070	30	60	317	297
071	24	85*	33	31
072	56	80*	105	100
073	23	80	325	309
074	45	75	153	145
075	8	72	190	179
077	20	86	429	409
084	27	75	289	274
085	0	85	828	789
087	0	96	112	107
088	0	99	439	421
089	0	99*	39	37
090	10	100	146	140
093	41	96	198	190
098	0	83	125	119
099	0	93	73	70
Totals			**6,129**	**5,800**

*Estimated

Table 13. Available Parking-Lombard Ave. Arena Site

Block #	# Deductions	% Spaces Available	Total Available Supply	6:30-7:30 P.M. Available Supply
001	0	77	571	541
002	0	85	134	128
003	56	91	42	38
004	0	91	89	85
005	0	80*	182	173
006	24	68	41	39
007	7	80	32	30
008	66	72	124	117
009	86	50	32	30
011	20	50*	30	28
012	0	85	13	12
013	0	50*	33	30
014	0	56	41	38
016	0	54	55	51
018	0	50*	14	12
019	7	50*	16	14
024	6	50*	41	38
025	0	75*	100	75
026	0	80	380	361
028	10	96	20	19
029	10	28	10	9
037	0	90	18	17
038	0	93	844	808
039	0	95	126	121
040	0	83	29	28
046	0	50*	42	39
047	0	16	18	14
050	0	72	293	277
074	45	75	153	145
075	8	72	190	179
082	30	40	144	130
083	14	75	177	168
084	27	75	289	274
085	0	85	828	789
086	32	96	113	108
087	0	96	112	107
088	0	99	439	421
089	0	99*	39	37
090	10	100	146	140
093	41	96	198	190
Totals			**6,198**	**5,860**

APPENDIX 2

REGIONAL TRAFFIC PROJECTIONS

Table 14. Projected 1996 Populations

Postal Code/Area	1996 Population
R2C	30,626
R2G	34,608
R2H	17,552
R2J	24,183
R2K	30,987
R2L	16,981
R2M	37,127
R2N	21,616
R2P	19,241
R2R	19,310
R2V	33,082
R2W	27,089
R2X	15,224
R2Y	22,688
R3A	2,787
R3B	12,022
R3C	12,817
R3E	24,191
R3G	19,517
R3J	27,285
R3K	12,439
R3L	12,683
R3M	24,183
R3N	20,349
R3P	14,819
R3R	27,855
R3S	4,064
R3T	40,202
R3V	6,573
R3W	3,526
R3X	6,984
R3Y	2,646
East St. Paul	5,000
West St. Paul	3,000
Headingly	1,369
St.Vital/ S.Perimeter	1,300
Total Population	**635,952**

Table 15. Population Adjustment Factors

Postal Code/Area	Average Household Income (1986)	Population Adjustment Factor
R2C	36,054	1.2
R2G	35,596	1.2
R2H	25,785	0.2
R2J	41,680	1.8
R2K	33,176	0.9
R2L	25,753	0.2
R2M	33,283	0.9
R2N	39,873	1.6
R2P	36,505	1.3
R2R	34,575	1.1
R2V	33,568	1.0
R2W	21,992	0.0
R2X	26,486	0.3
R2Y	37,583	1.4
R3A	16,090	0.0
R3B	15,463	0.0
R3C	26,255	0.2
R3E	24,142	0.0
R3G	26,551	0.3
R3J	33,280	0.9
R3K	44,526	2.1
R3L	25,851	0.2
R3M	38,858	1.5
R3N	42,885	1.9
R3P	83,571	6.0
R3R	45,000*	2.1
R3S	46,169	2.2
R3T	38,212	1.4
R3V	42,127	1.8
R3W	38,000*	1.4
R3X	51,805	2.8
R3Y	40,000*	1.6
East St. Paul	45,000*	2.1
West St. Paul	45,000*	2.1
Headingly	40,000*	1.6
St.Vital/ S.Perimeter	40,000*	1.6

*Estimated 1986 Average Household Income- $33,477

Table 16. Adjusted 1996 Populations

Postal Code/Area	1996 Population	Adjustment Factor	Adjusted 1996 Population
R2C	30,626	1.2	36,751
R2G	34,608	1.2	41,530
R2H	17,552	0.2	3,510
R2J	24,183	1.8	43,529
R2K	30,987	0.9	27,888
R2L	16,981	0.2	3,396
R2M	37,127	0.9	33,414
R2N	21,616	1.6	34,586
R2P	19,241	1.3	25,013
R2R	19,310	1.1	21,241
R2V	33,082	1.0	33,082
R2W	27,089	0.0	0
R2X	15,224	0.3	4,567
R2Y	22,688	1.4	31,763
R3A	2787	0.0	0
R3B	12,022	0.0	0
R3C	12,817	0.2	2,563
R3E	24,191	0.0	0
R3G	19,517	0.3	5,855
R3J	27,285	0.9	24,557
R3K	12,439	2.1	26,122
R3L	12,683	0.2	2,537
R3M	24,183	1.5	36,275
R3N	20,349	1.9	38,663
R3P	14,819	6.0	88,914
R3R	27,855	2.1	58,496
R3S	4,064	2.2	8,941
R3T	40,202	1.4	56,282
R3V	6,573	1.8	11,831
R3W	3,526	1.4	4,936
R3X	6,984	2.8	19,555
R3Y	2,646	1.6	4,234
East St. Paul	5,000	2.1	10,500
West St. Paul	3,000	2.1	6,300
Headingly	1,369	1.6	2,190
St.Vital/ S. Perimeter	1,300	1.6	2,080
Total Adjusted Population			**751,101**

Table 17. Season Tickets and Vehicle Trips per Postal Code/Area

Postal Code/Area	Adjusted Population	Season Tickets	Vehicle Trips
R2C	36,751	392	156
R2G	41,530	442	177
R2H	3,510	37	15
R2J	43,529	464	186
R2K	27,888	297	119
R2L	3,396	36	14
R2M	33,414	356	142
R2N	34,586	368	147
R2P	25,013	266	106
R2R	21,241	226	90
R2V	33,082	352	141
R2X	4,567	49	20
R2Y	31,763	338	135
R3C	2,563	27	0
R3G	5,855	62	25
R3J	24,557	262	105
R3K	26,122	278	111
R3L	2,537	27	11
R3M	36,275	386	154
R3N	38,663	412	165
R3P	88,914	948	379
R3R	58,496	624	250
R3S	8,941	95	38
R3T	56,282	600	240
R3V	11,831	126	50
R3W	4,936	53	21
R3X	19,555	209	84
R3Y	4,234	45	18
East St. Paul	10,500	112	45
West St. Paul	6,300	67	27
Headingly	2190	22	9
St.Vital/ S.Perimeter	2080	22	9
Totals	**751,101**	**8,000**	**3,189**

Table 18. Non-Season Tickets and Vehicle Trips per Postal Code/Area

Postal Code/Area	1996 Population	Non-Season Tickets	Arrivals by car	Vehicle Trips
R2C	30,626	385	199	80
R2G	34,608	435	225	90
R2H	17,552	221	114	45
R2J	24,183	304	157	62
R2K	30,987	309	202	81
R2L	16,981	214	111	45
R2M	37,127	466	241	96
R2N	21,616	272	141	57
R2P	19,241	242	125	50
R2R	19,310	243	126	51
R2V	33,082	415	215	86
R2W	27,089	341	177	71
R2X	15,224	196	102	40
R2Y	22,688	285	148	59
R3A	2,787	35	0	0
R3B	12,022	151	0	0
R3C	12,817	161	0	0
R3E	24,191	304	157	63
R3G	19,517	246	127	51
R3J	27,285	343	178	71
R3K	12,439	156	81	33
R3L	12,683	160	83	33
R3M	24,183	304	157	63
R3N	20,349	256	133	53
R3P	14,819	186	96	39
R3R	27,855	350	181	72
R3S	4,064	51	27	11
R3T	40,202	506	261	104
R3V	6,573	83	43	18
R3W	3,526	44	23	9
R3X	6,984	88	46	18
R3Y	2,646	33	17	7
East St. Paul	5,000	63	63	25
West St. Paul	3,000	38	38	15
Headingly	1,369	17	17	7
St.Vital/ S.Perimeter	1,300	16	16	6
Totals	**635,952**	**8,000**	**4,027**	**1,611**

Table 19. Total and Peak Hour Vehicle Trips Per Postal Code/Area

Postal Code/Area	Total Vehicle Trips	Peak Hour Vehicle Trips	6:30-7:00 P.M. Vehicle Trips	7:00-7:30 P.M. Vehicle Trips
R2C	236	177	59	118
R2G	267	200	67	133
R2H	60	45	15	30
R2J	248	186	62	124
R2K	200	150	50	100
R2L	59	45	15	30
R2M	238	178	60	118
R2N	204	153	51	102
R2P	156	117	40	77
R2R	141	106	35	71
R2V	227	171	57	114
R2W	71	54	18	36
R2X	60	45	15	30
R2Y	194	146	49	97
R3E	63	47	16	31
R3G	76	57	19	38
R3J	176	132	44	88
R3K	144	108	36	72
R3L	44	33	11	22
R3M	217	163	54	109
R3N	218	164	54	110
R3P	418	313	104	209
R3R	322	241	80	161
R3S	49	36	12	24
R3T	344	258	85	173
R3V	68	51	17	34
R3W	30	23	8	15
R3X	102	76	26	50
R3Y	25	18	6	12
East St. Paul	70	53	17	35
West St. Paul	42	31	10	21
Headingly	16	12	4	8
St.Vital/ S.Perimeter	15	11	4	7
Totals	**4,800**	**3,600**	**1,200**	**2,400**

Table 20. Postal Code/Area Route Assignments-Winnipeg Convention Centre Site

Postal Code/ Area	Downtown Entry Routes	% Use	6:30-7:00 P.M. Vehicle Trips	7:00-7:30 P.M. Vehicle Trips
R2C	Provencher Bridge	70	41	83
	Higgins Ave.	30	18	35
R2G	Disraeli Fwy.	90	60	120
	Provencher Bridge	10	7	13
R2H	Main St. Bridge	65	10	20
	Provencher Bridge	35	5	10
R2J	Main St. Bridge	100	62	124
R2K	Disraeli Fwy.	50	25	50
	Provencher Bridge	25	13	25
	Higgins Ave.	25	12	25
R2L	Disraeli Fwy.	45	7	14
	Provencher Bridge	35	5	10
	Higgins Ave.	20	3	6
R2M	Main St. Bridge	70	42	83
	Osborne St.Bridge	15	9	18
	Midtown Bridge	15	9	17
R2N	Main St. Bridge	50	26	51
	Osborne St. Bridge	25	13	26
	Midtown Bridge	25	12	25
R2P	Cumberland Ave.	100	40	77
R2R	Cumberland Ave.	100	35	71
R2V	Main St. Underpass	60	34	68
	Salter St. Bridge	30	17	34
	Cumberland Ave.	10	6	12
R2W	Main St. Underpass	60	11	22
	Salter St. Bridge	40	7	14
R2Y	Portage Ave.	50	25	49
	Broadway	50	24	49
R2X	Cumberland Ave.	100	15	30
R3E	Cumberland Ave.	75	12	13
	Sargent Ave.	15	2	5
	Ellice Ave.	10	2	3
R3G	Portage Ave.	40	8	16
	Ellice Ave.	30	6	12
	Broadway	20	4	8
	Sargent Ave.	10	1	2
R3J	Portage Ave.	50	22	44
	Broadway	50	22	44
R3K	Portage Ave.	50	18	36
	Broadway	50	18	36

Table 20 continued

R3L	Osborne St. Bridge	50	5	11
	Midtown Bridge	50	6	11
R3M	Broadway	30	16	33
	Osborne St. Bridge	25	14	27
	Midtown Bridge	25	14	27
	Portage Ave.	20	10	22
R3N	Broadway	50	27	55
	Portage Ave.	30	16	33
	Osborne St. Bridge	10	5	11
	Midtown Bridge	10	6	11
R3P	Portage Ave.	30	31	63
	Broadway	30	31	63
	Osborne St. Bridge	20	21	42
	Midtown Bridge	20	21	41
R3R	Portage Ave.	30	24	49
	Broadway	30	24	48
	Osborne St. Bridge	20	16	32
	Midtown Bridge	20	16	32
R3S	Portage Ave.	25	3	6
	Broadway	25	3	6
	Osborne St. Bridge	25	3	6
	Midtown Bridge	25	3	6
R3T	Osborne St. Bridge	50	43	86
	Midtown Bridge	50	42	87
R3V	Osborne St. Bridge	50	9	17
	Midtown Bridge	50	8	17
R3W	Provencher Bridge	70	6	11
	Higgins Ave.	30	2	4
R3X	Main St. Bridge	100	26	50
R3Y	Midtown Bridge	50	3	6
	Osborne St. Bridge	50	3	6
East St. Paul	Disraeli Fwy.	100	17	35
West St. Paul	Main St. Underpass	100	10	21
Headingly	Portage Ave.	50	2	4
	Broadway	50	2	4
St.Vital/ S.Perimeter	Main St.Bridge	100	4	7
Total Vehicle Trips			**1,200**	**2,400**

Table 21. Postal Code/Area Route Assignments-Forks Site

Postal Code/ Area	Downtown Entry Route	% Use	6:30-7:00 P.M. Vehicle Trips	7:00-7:30 P.M. Vehicle Trips
R2C	Provencher Bridge	80	47	94
	Higgins Ave.	20	12	24
R2G	Disraeli Fwy.	90	60	120
	Provencher Bridge	10	7	13
R2H	Main St. Bridge	60	9	18
	Provencher Bridge	40	6	12
R2J	Main St. Bridge	75	47	93
	Provencher Bridge	25	15	31
R2K	Provencher Bridge	50	25	50
	Disraeli Fwy.	40	20	40
	Higgins Ave.	10	5	10
R2L	Provencher Bridge	45	7	14
	Disraeli Fwy.	40	6	12
	Higgins Ave.	15	2	4
R2M	Main St. Bridge	80	48	94
	Midtown Bridge	20	12	24
R2N	Main St. Bridge	75	38	77
	Midtown Bridge	25	13	25
R2P	Cumberland Ave.	100	40	77
R2R	Cumberland Ave.	100	35	71
R2V	Main St. Underpass	65	37	74
	Salter St. Bridge	30	17	34
	Cumberland Ave.	5	3	6
R2W	Main St. Underpass	75	14	28
	Salter St. Bridge	25	4	8
R2X	Cumberland Ave.	100	15	30
R2Y	Portage Ave.	50	25	49
	Broadway	50	24	48
R3E	Cumberland Ave.	75	12	23
	Sargent Ave.	15	2	5
	Ellice Ave.	10	2	3
R3G	Portage Ave.	40	8	16
	Ellice Ave.	30	6	12
	Broadway	20	4	8
	Sargent Ave.	10	1	2
R3J	Portage Ave.	50	22	44
	Broadway	50	22	44
R3K	Portage Ave.	50	18	36
	Broadway	50	18	36
R3L	Midtown Bridge	40	4	8
	Main St. Bridge	40	4	8

Table 21 continued

R3L cont	Osborne St. Bridge	20	3	6
R3M	Midtown Bridge	30	16	32
	Main St. Bridge	30	16	33
	Broadway	20	11	22
	Osborne St. Bridge	10	6	11
	Portage Ave.	10	5	11
R3N	Broadway	35	16	32
	Midtown Bridge	20	11	22
	Portage Ave.	20	11	22
	Main St. Bridge	20	10	21
	Osborne St. Bridge	5	3	6
R3P	Midtown Bridge	30	31	63
	Main St. Bridge	30	31	63
	Portage Ave.	20	21	42
	Broadway	20	21	41
R3R	Midtown Bridge	30	24	49
	Main St. Bridge	30	24	48
	Portage Ave.	20	16	32
	Broadway	20	16	32
R3S	Main St. Bridge	30	3	7
	Midtown Bridge	30	4	8
	Portage Ave.	15	2	4
	Broadway	15	2	4
	Osborne St. Bridge	10	1	1
R3T	Midtown Bridge	45	38	78
	Main St. Bridge	45	38	78
	Osborne St. Bridge	10	9	17
R3V	Midtown Bridge	45	8	16
	Main St. Bridge	45	8	16
	Osborne St. Bridge	10	1	2
R3W	Provencher Bridge	80	7	12
	Higgins Ave.	20	1	3
R3X	Main St. Bridge	100	26	50
R3Y	Midtown Bridge	45	3	5
	Main St. Bridge	45	2	5
	Osborne St. Bridge	10	1	2
East St. Paul	Disraeli Fwy.	100	17	35
West St. Paul	Main St. Underpass	100	10	21
Headingly	Portage Ave.	50	2	4
	Broadway	50	2	4
St.Vital/ S. Perimeter	Main St. Bridge	100	4	7
Total Vehicle Trips			**1,200**	**2,400**

Table 22. Postal Code/Area Route Assignments-Lombard Ave. Site

Postal Code/ Area	Downtown Entry Routes	% Use	6:30-7:00 P.M. Vehicle Trips	7:00-7:30 P.M. Vehicle Trips
R2C	Provencher Bridge	60	35	71
	Higgins Ave.	40	24	47
R2G	Disraeli Fwy.	90	60	120
	Provencher Bridge	10	7	13
R2H	Main St. Bridge	50	8	15
	Provencher Bridge	50	7	15
R2J	Main St. Bridge	50	31	62
	Provencher Bridge	50	31	62
R2K	Disraeli Fwy.	50	25	50
	Higgins Ave.	25	12	25
	Provencher Bridge	25	13	25
R2L	Disraeli Fwy.	55	8	16
	Higgins Ave.	25	4	8
	Provencher Bridge	20	3	6
R2M	Main St. Bridge	80	48	94
	Midtown Bridge	20	12	24
R2N	Main St. Bridge	75	38	77
	Midtown Bridge	25	13	25
R2P	Cumberland Ave.	60	24	46
	Logan Ave.	20	7	14
	William Ave.	20	8	15
R2R	Cumberland Ave.	60	21	43
	Logan Ave.	20	7	14
	William Ave.	20	7	14
R2V	Main St. Underpass	65	37	74
	Salter St. Bridge	30	17	34
	Cumberland Ave.	5	3	6
R2W	Main St. Underpass	75	14	28
	Salter St. Bridge	25	4	8
R2X	Cumberland Ave.	60	9	18
	Logan Ave.	20	3	6
	William Ave.	20	3	6
R2Y	Portage Ave.	75	37	74
	Broadway	25	12	24
R3E	Cumberland Ave.	80	15	25
	Sargent Ave.	15	2	5
	Sargent Ave.	5	1	1
R3G	Portage Ave.	40	8	16
	Ellice Ave.	40	8	16
	Broadway	10	2	4
	Sargent Ave.	10	1	2
R3J	Portage Ave.	75	33	66

Table 22 continued

R3J cont	Broadway	25	11	22
R3K	Portage Ave.	75	27	54
	Broadway	25	9	18
R3L	Midtown Bridge	40	4	8
	Main St. Bridge	40	4	8
	Osborne St. Bridge	20	3	6
R3M	Portage Ave.	35	19	38
	Midtown Bridge	20	11	22
	Main St. Bridge	20	11	22
	Broadway	15	8	16
	Osborne St. Bridge	10	5	11
R3N	Portage Ave.	50	27	55
	Broadway	20	11	22
	Midtown Bridge	15	8	17
	Main St. Bridge	15	8	16
R3P	Portage Ave.	40	42	84
	Main St. Bridge	30	31	63
	Midtown Bridge	30	31	62
R3R	Portage Ave.	40	32	64
	Main St. Bridge	30	24	48
	Midtown Bridge	30	24	49
R3S	Portage Ave.	40	5	10
	Midtown Bridge	20	2	4
	Main St. Bridge	20	2	5
	Broadway	15	2	4
	Osborne St. Bridge	5	1	1
R3T	Midtown Bridge	45	38	78
	Main St. Bridge	45	38	78
	Osborne St. Bridge	10	9	17
R3V	Midtown Bridge	45	8	16
	Main St. Bridge	45	8	16
	Osborne St. Bridge	10	1	2
R3W	Provencher Bridge	60	5	9
	Higgins Ave.	40	3	6
R3X	Main St. Bridge	100	26	50
R3Y	Midtown Bridge	45	3	5
	Main St. Bridge	45	2	5
	Osborne St. Bridge	10	1	2
East St. Paul	Disraeli Fwy.	100	17	35
West St. Paul	Main St. Underpass	100	10	21
Headingly	Portage Ave.	75	3	6
	Broadway	25	1	2
St.Vital/ S.Perimeter	Main St. Bridge	100	4	7
Total Vehicle Trips			**1,200**	**2,400**

Table 23. Downtown Entry Route Utilization-Winnipeg Convention Centre Site

Downtown Entry Route	6:30-7:00 P.M. Vehicle Trips	7:00-7:30 P.M. Vehicle Trips	Total Peak Hour Vehicle Trips
Provencher Bridge	77	152	229
Higgins Ave.	35	70	105
Disraeli Fwy.	109	219	328
Main St. Bridge	170	335	505
Osborne St. Bridge	141	282	423
Midtown Bridge	140	280	420
Cumberland Ave.	108	213	321
Main St. Underpass	55	111	166
Salter St. Bridge	24	48	72
Portage Ave.	159	322	481
Broadway	171	346	517
Sargent Ave.	3	7	10
Ellice Ave.	8	15	23
Total Vehicle Trips	**1,200**	**2,400**	**3,600**

Table 24. Downtown Entry Route Utilization-Forks Site

Downtown Entry Route	6:30-7:00 P.M. Vehicle Trips	7:00-7:30 P.M. Vehicle Trips	Total Peak Hour Vehicle Trips
Provencher Bridge	114	226	340
Higgins Ave.	20	41	61
Disraeli Fwy.	103	207	310
Main St. Bridge	308	618	926
Osborne St. Bridge	24	45	69
Midtown Bridge	164	331	495
Cumberland Ave.	105	207	312
Main St. Underpass	61	123	184
Salter St. Bridge	21	42	63
Portage Ave.	130	260	390
Broadway	139	278	417
Sargent Ave.	3	7	10
Ellice Ave.	8	15	23
Total Vehicle Trips	**1,200**	**2,400**	**3,600**

Table 25. Downtown Entry Route Utilization-Lombard Ave. Site

Downtown Entry Route	6:30-7:00 P.M. Vehicle Trips	7:00-7:30 P.M. Vehicle Trips	Total Peak Hour Vehicle Trips
Provencher Bridge	101	201	302
Higgins Ave.	43	86	129
Disraeli Fwy.	110	221	331
Main St. Bridge	283	566	849
Osborne St. Bridge	20	39	59
Midtown Bridge	154	310	464
Cumberland Ave.	70	138	208
Logan Ave.	18	36	54
William Ave.	18	35	53
Main St. Underpass	61	123	184
Salter St. Bridge	21	42	63
Portage Ave.	233	467	700
Broadway Ave.	56	112	168
Sargent Ave.	3	7	10
Ellice Ave.	9	17	26
Total Vehicle Trips	**1,200**	**2,400**	**3,600**