



School for Social and Policy Research
Report

Expenditure on Electronic Gaming Machines in the Northern Territory: A Venues-Based Analysis

Martin Young
William Tyler
David Lamb
Matthew Stevens

Expenditure on Electronic Gaming Machines in the Northern Territory: A Venues-Based Analysis

Report prepared for the Community Benefit Committee,
Department of Justice, Northern Territory Government

Authored by:

Martin Young
William Tyler
David Lamb
Matthew Stevens

School for Social and Policy Research
Charles Darwin University.

The authors wish to thank Dr Bruce Doran, Australian National University, Canberra, for his collaborative contribution to Chapter 3 'Spatial analysis of expenditure 'hotspots', and Waimei Lee, Charles Darwin University, for assistance with report production and formatting.

September 2008

Expenditure on Electronic Gaming Machines in the Northern Territory: A Venues-Based Analysis

ISBN 978-0-9804578-5-8

© 2008 School for Social and Policy Research, Charles Darwin University

Printed by Uniprint NT, Charles Darwin University

Preface

This report presents a supply-side analysis of electronic gaming machine (EGM) venues in the NT. It is the primary output of Project C6 “Typology of Gaming Machine Venues in the NT”. The objective of this project is to explore the characteristics of particular venues in the NT. This was achieved through a series of analyses of the Northern Territory Department of Justice *EGM Player Loss Database* over the past decade. The report combines the key findings from the range of supply-side analyses of venues conducted by the CDU research team during 2008 in a single document. It presents some descriptive analysis of EGM trends by venue type, explores the spatial and temporal distribution of expenditure over a five year period (for which monthly data was available), and constructs separate typologies for clubs and hotels that may be used to aid regulatory decision making (see Young et al. 2006, *Gambling Practice and Policy in the Northern Territory: A Research Programme*). Its purpose is to present a plain-language description of each analysis with their key implications for research and harm minimisation.

The Research Team

Dr Martin Young (Chief Investigator), Senior Research Fellow (SSPR)

Dr William Tyler, Adjunct Principal Research Fellow (SSPR)

Mr David Lamb, Research Associate (SSPR)

Mr Matthew Stevens, Research Fellow (SSPR)

Ms Waimei Lee, Research Associate, (SSPR)

Acknowledgement

The project was funded entirely by the Community Benefit Fund of the Northern Territory Department of Justice.

Contents

Preface	iii
Executive Summary	vi
Chapter 1. Introduction	1
1.1 Purpose of the report.....	1
1.2 Scope of the report	1
Chapter 2. EGM Player Loss in the Northern Territory	2
2.1 Rationale and scope	2
2.2 History of EGMs in the Northern Territory	2
2.3. Patterns of EGM growth 1996 - 2007	3
2.4 Changes in total player loss	4
2.5 Changes in player loss per machine.....	5
Chapter 3. Spatial Analysis of EGM Expenditure ‘Hotspots’	6
3.1 Rationale and scope	6
3.2 Spatial relationship between venues and social contexts in the NT	6
3.3 Kernel-density estimation	7
3.4 Distribution of EGM venues in the Northern Territory	7
3.5 Darwin EGM expenditure patterns 2002	11
3.6. Darwin EGM expenditure patterns 2007	13
3.7 Seasonal variation in Darwin EGM expenditure	14
3.8 Alice Springs EGM expenditure patterns 2002	16
3.9 Alice Springs EGM expenditure patterns 2007	17
3.10 Seasonal variation in Alice Springs EGM expenditure	18
3.11 Patterns of EGM expenditure in the Northern Territory.....	20
3.12 Temporal patterns of EGM expenditure	21
3.13 Implications for research.....	21
3.14 Implications for harm minimisation.....	22
Chapter 4: A Typological Analysis of Community Venues	23
4.1. Rationale and scope	23
4.2. Review of EGM capping policies	23
4.3. Development of a venues typology.....	27
4.4. Implications for harm minimisation.....	36
4.5. Implications for research.....	40
References	41

Executive Summary

Chapter 2. EGM player loss in the Northern Territory (1996/97 to 2006/07)

This Chapter presents a descriptive analysis of the Department of Justice EGM expenditure (also referred to as player loss) database over the last 10 years.

Despite the capping limits on individual venues, the introduction of EGMs has steadily continued over the past decade both through an increase within existing venues to the capping limit and through the opening of new venues. Between 1996/97 and 2006/07 the number of EGMs in clubs and hotels has doubled. EGM numbers in the casinos (combined) increased by 45% over the same period.

At the end of the 2006/07 financial year, EGM numbers had increased to 1,921 in total, with 833 machines in the casinos (289 in Lasseters, Alice Springs and 544 in Skycity, Darwin) and 1,088 in hotels and clubs. This equates to 12.5 machines per 1,000 adult residents.

The total player loss (i.e., the amount spent by players after winnings have been deducted) (deflated to 1996 AUD) increased by 154% from \$44.02 million in 1996/97 to \$112.0 million in 2006/07.

The percentage increase from 1996/97 to 2006/07 was significantly larger for community venues (210% - \$16.02 million to \$49.76 million) compared to the growth for the two casinos (122% - \$28 million to \$62.7 million).

Average player loss per EGM (combined community venues and casinos) increased steadily (deflated to 1996 AUD), from a base of \$40,996 in 1996/97 to \$58,332 in 2006/07 (an increase of 42%). Average player loss per EGM increased by 53% for casinos from \$48,700 to \$74,800. Average player loss per EGM in community venues increased 42% from \$32,100 to \$45,700 over the same period.

Chapter 3: Spatial analysis of EGM expenditure ‘hotspots’

To shed light on the geography of EGM growth in the NT, this Chapter presents a spatial and temporal examination of EGM expenditure trends in the main urban centres of Darwin and Alice Springs on a venue by venue basis over a five year period.

A Geographic Information Systems (GIS) approach, using kernel density analysis, was used to investigate the spatial distribution of EGM expenditure on a venue by venue basis.

The expenditure data were provided by Licensing and Regulation, NT Department of Justice, in the form spreadsheets compiled from government monthly *Gaming Machine Performance Tables*. These data comprised EGM numbers and monthly player loss data from June 2002 to December 2007 (i.e. a 66 month series) for each of the venues currently operating in the NT.

While the specificities of EGM expenditure have been explored in two urban contexts, the emergent spatial patterns and changes over time suggest three general types of development.

1. *Suburban gambling complexes* (i.e. northern suburbs of Darwin and Palmerston) describe the small groups of large clubs that possess the maximum permissible number of EGMs (i.e. 45). These venues have considerable attractive power in their own right and may be considered gambling ‘destinations’, where the activity of gambling in itself is a significant drawcard.

2. *City-centre gambling agglomerations* describe the clustering of a number of smaller gambling venues in and around the Central Business District (CBD) (e.g. Darwin and Alice city centres). In contrast to the suburban complex, these venues may rely more heavily on the pulling power of the surrounding facilities rather their individual attractive power.

3. *Opportunistic gambling nodes* describe those venue(s) that take advantage of their location to specific local markets (e.g. the expenditure hotspots in Nightcliff, Marrara and the Darwin rural fringe). Venues in such locations may attract passing trade or service defined residential areas.

These development patterns will produce different sets of social impacts. For example, it is clear that Palmerston is highly provisioned with EGMs, and given its distance from Darwin, most likely drawing clientele from the local area. The growth in this relatively socially disadvantaged area is suggestive of the link between vulnerable populations and EGM expenditure identified by previous research. The analysis makes clear that local-level analysis may usefully inform policy development, and questions the merits of a generic capping policy in minimising social harm.

While this analysis provides a valuable spatio-temporal description of EGM expenditure patterns over the last five years, the socio-spatial characteristics of venue catchments remain largely conjectural. Until research is conducted that involves patron surveys, spatial configuration of the link between catchment characteristics, EGM expenditure, and gambling risk will remain unclear.

Chapter 4: A typological analysis of community venues

This Chapter examines ways in which a socio-spatial analysis of patterns of EGM expenditure might inform the development of licensing policy in the NT, based on the development of an empirically-derived typology of hotels and clubs.

For hotels four clusters were typified in socio-spatial terms:

1. *Inner city precinct hotels*. These hotels are located either in, or on the fringes, of the Darwin CBD. On the one hand these hotels are located in of a socially-advantaged local catchment of the burgeoning apartment blocks of the inner city. On the other hand, the combination of the high numbers and densities of EGMs creates a competitive environment that appears to rely on a transient, non-local clientele. They form part of the *city-centre gambling agglomerations* identified by Chapter 3.

2. *Suburban/ remote resort hotels.* All of these hotels, with the exception of the Ayer's Rock Resort, are located in the suburbs of Darwin and Alice Springs. The suburban hotels are located in middle to high socio-economic environments characterised by lower local levels of EGM and venue densities.

3. *Rural and minor urban hotels.* With the exception of the two outliers to this cluster – The Winnellie Hotel which adjoins an industrial area, and the Palmerston Tavern centred in Darwin's main satellite city – the hotels in this group are located in rural or minor urban areas with higher than average EGM densities and medium levels of socio-economic advantage.

4. *"Out of the way" hotels.* This small cluster is socio-spatially quite heterogeneous, though its member hotels tend to be located in small off highway townships or roadway service hamlets. Their catchments (high levels of EGM dispersion, low EGM density) are difficult to define, and are probably quite seasonally variable and also heterogeneous.

Clubs were more difficult to typologise or label than hotels given there is a strong sporting basis to many of the suburban and rural social clubs. They were classified as follows:

1. *Specialised inner city sport and memorial clubs*
2. *Suburban social and recreational clubs*
3. *Rural town and satellite social and recreational clubs*
4. *Peripheral city clubs (i.e. on fringe of populated areas)*
5. *Remote mining community clubs*

The categories are indicative of a typical functional orientation rather than of homogenous categories. The catchment areas of the clubs is no doubt much wider than that for most of the hotel clusters, given the small size of the urban centres of the NT (including Darwin and environs), the high levels of accessibility and the wide networks of association through sport, friendship and work contacts that they draw upon for both membership and visitor patronage.

While there are empirically verifiable contextual clusters for both hotels and clubs in the NT, these are not so easily matched to the levels of EGM activity, whether it be by volume of revenue or EGM performance. Empirical evidence from NT data for a causal link between capping (jurisdictional or venue) and levels of EGM activity is, at this stage, not compelling.

While much of the venue and locality information requested is extremely relevant to any licensing decision, it would appear that a many of the details requested by the Licensing Commission on the nature of the immediate neighbourhood (i.e. density of population, proximity to other venues and density of gaming machines) is influenced by policies based on metropolitan areas, where the proximity and exposure effects are major concerns. These factors in harm minimisation do not loom nearly as large for NT venues, where the main determinants of machine activity are defined more along urban/rural lines and where higher densities, both of machines and venues, are characteristic of middle or higher income areas.

Chapter 1. Introduction

1.1 Purpose of the report

This report presents a supply-side analysis of EGM venues in the NT. It is the primary output of Project C6 “Typology of Gaming Machine Venues in the NT”. The objective of this project is to explore the characteristics of particular venues in the NT. This was achieved through a series of analyses of the NT Department of Justice EGM Player Loss Data from the past decade. The report presents some descriptive analysis of EGM trends by venue type, explores the spatial and temporal distribution of expenditure over a five year period (for which monthly data was available), and constructs separate typologies for clubs and hotels that may be used to aid regulatory decision making (see Young et al. 2006, *Gambling Practice and Policy in the Northern Territory: A Research Programme*). The current report combines the key findings from the range of supply-side analyses of venues conducted by the CDU research team during 2008 in a single document. Its purpose is to present a plain-language description of each analysis along with key implications for research and harm minimisation.

1.2 Scope of the report

The report is divided into four Chapters.

Chapter 2 presents an updated analysis of the player loss database up to the end of the 2006/07 financial year. This analysis updates the trends reported in the 2005 Prevalence Survey Report (Young et al., 2006). Importantly, this revised descriptive analysis is conducted on data deflated to the equivalent 1996 AUD (the year EGMs were first introduced into the NT) and is thus adjusted for inflation.

Chapter 3 presents a spatio-temporal analysis of player loss trends (GIS kernel density estimation). This consists of a spatial and temporal examination of EGM expenditure trends in the main urban centres of the NT on a venue by venue basis over a five year period (2002-2007). This Chapter uses GIS technology to visually present changes over time via a series of two and three-dimensional maps. Their purpose is to describe the spatial trends in EGM growth over time to identify patterns of development that may inform EGM regulation.

Chapter 4 argues for the importance of a venue-centric approach to the implementation of any capping regime for EGM numbers, whether at the jurisdictional, regional or venue-type (i.e. hotel or club) level. It examines ways in which a socio-spatial analysis of patterns of EGM expenditure might inform the development of licensing policy in the NT, based on the development of an empirically-derived typology of hotels and clubs.

Chapter 2. EGM Player Loss in the Northern Territory

2.1 Rationale and scope

This Chapter presents a descriptive analysis of the Department of Justice EGM expenditure (also referred to as player loss) database over the last 10 years. This database records EGM expenditure and number of machines per venue on a monthly basis from 1996. In order to adjust for the effect of inflation, a deflation to 1996 values was performed on this expenditure data using the quarterly Consumer Price Index (CPI), available on a regional level for capital cities inclusive of Darwin (Australian Bureau of Statistics, 2008a). This involved dividing the 1996 CPI by the CPI for each quarter included in the study to obtain a factor to convert the expenditure data to 1996 AUDs. Based on this deflated database, the current Chapter describes the rate of EGM growth, the changes in total expenditure, and changes in expenditure per EGM over a ten year period. The analysis is conducted for both casinos and 'community' venues (a general term for clubs and pubs).

2.2 History of EGMs in the Northern Territory

EGMs have formed part of the NT's gambling scene since 1981, the year they were first introduced into the Darwin and Alice Springs casinos (McMillen & Togni, 2000, p. 15). These casinos enjoyed exclusive gaming rights within their licensed areas, defined by a line north of Tennant Creek, a town roughly equidistant between Darwin in the north and Alice Springs to the south. While the presence of EGMs in casinos across Australia was well established by this time, a national trend of EGM introduction into non-casino or community venues was well underway. By 1994, EGMs had been introduced into community venues in the ACT, Victoria, Queensland and South Australia (Alder, 1998, p.4). Pecuniary forces drove this trend. The continued expansion of federal powers was eroding the tax base of the States and Territories and gambling revenue offered a mechanism of financial resistance (Alder, 1998, p.4). In addition, jurisdictions that had already introduced EGMs were attracting considerable market share, and hence revenues, from the residents of adjoining states. In the NT, hotels and clubs, arguing the case for their declining capacity to provide community services, had been lobbying for a greater share of the gambling market for some time (McMillen & Togni, 2000, p.118). Not surprisingly, the NT Government jumped aboard the EGM bandwagon. As the casinos already possessed gaming rights throughout the NT, the introduction of EGMs required a period of negotiation between the government and the casinos in order for the casinos to relinquish their licenses. The casinos agreed to surrender their exclusivity in exchange for a 22% share of gross profits generated by any non-casino EGMs operating within their respective license areas (Alder, 1998, p.4). This agreement paved the way for legislative change in the form of the *Gaming Machine Act 1995 No. 50/1995*, which sanctioned the subsequent introduction of EGMs into community venues. The first EGMs were switched on in the Nightcliff Sports Club, a northern suburb of Darwin, on the 1st of January 1996. An EGM restriction policy, set at 45 machines for clubs and 10 for hotels, was introduced several years later (Alder, 1998).

Despite these capping limits on individual venues, the introduction of EGMs has steadily continued over the past decade both through venues increasing their

number of machines to the maximum and through the opening of new gambling venues. The number of community venues with EGMs increased from 46 at the end of the 1996/97 financial year to 72 at the end of 2006/07. The number of actual machines in community venues has doubled from 499 in 1996/97 to 1,088 in 2006/07. This increase in machine numbers has been accompanied by an increase in player loss (the amount spent by players after winnings have been deducted). Player loss in community venues for 1996/97 was \$16,020,740. In real terms, this figure had increased threefold to \$49,761,658 million at the end of 2006/2007 (deflated to 1996 values). Not only has total player loss increased, so has the average profitability of individual machines. Real player loss per EGM (i.e. total player loss divided by the number of machines) increased from \$32,106 per EGM in 1996/97 to \$45,737 per EGM in 2006/07 (deflated to 1996 values).

2.3. Patterns of EGM growth 1996 - 2007

In 1996/97 there were 1,074 EGMs operating in the NT - 575 in the two casinos and 499 in hotels and clubs (Figure 2.1). Between 1996/97 and 2006/07 the number of EGMs in clubs and hotels has doubled. EGM numbers in the casinos (combined) had increased by 45% over the same period. At the end of the 2006/07 financial year, EGM numbers had increased to 1,921 in total, with 833 machines in the casinos (289 in Lasseters, Alice Springs and 544 in Skycity, Darwin) and 1,088 in hotels and clubs (Figure 2.1). This equates to 12.5 machines per 1,000 adult residents.

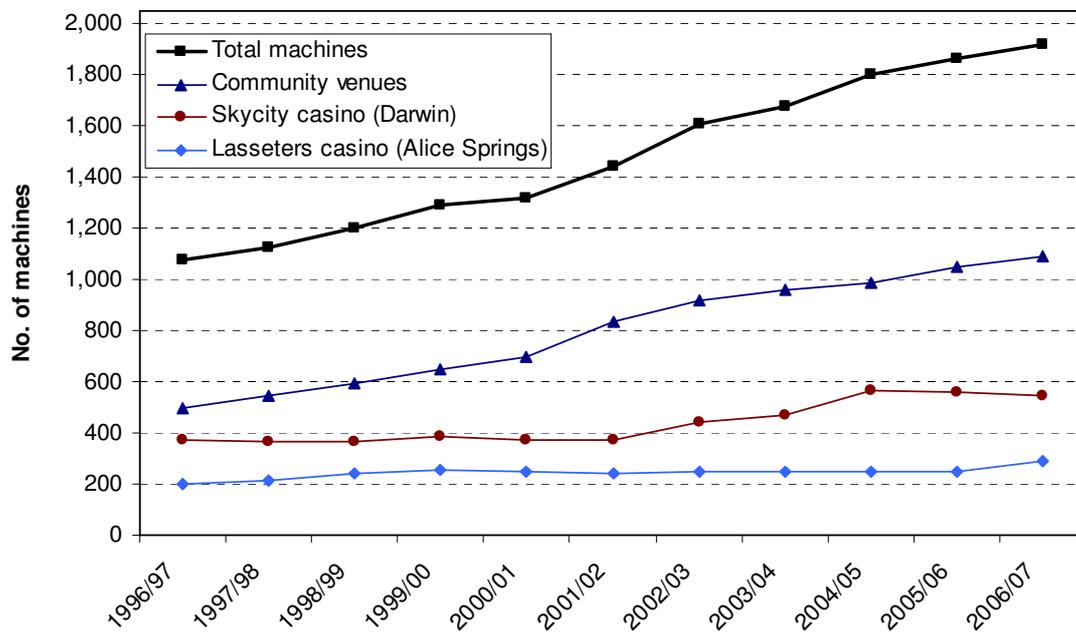


Figure 2.1. Number of EGMs by venue type

The proportion of EGMs in community venues increased from 46% to 57% of the total number of EGMs in the NT from 1996/97 to 2006/07 (Figure 2.2). The relative proportion of EGMs between the two casinos has remained relatively constant over this time with Skycity (Darwin) having 1.9 EGMs on average for every one in Lasseters (Alice Springs) with the ratio varying between 2.2 and 1.5 over 10 years.

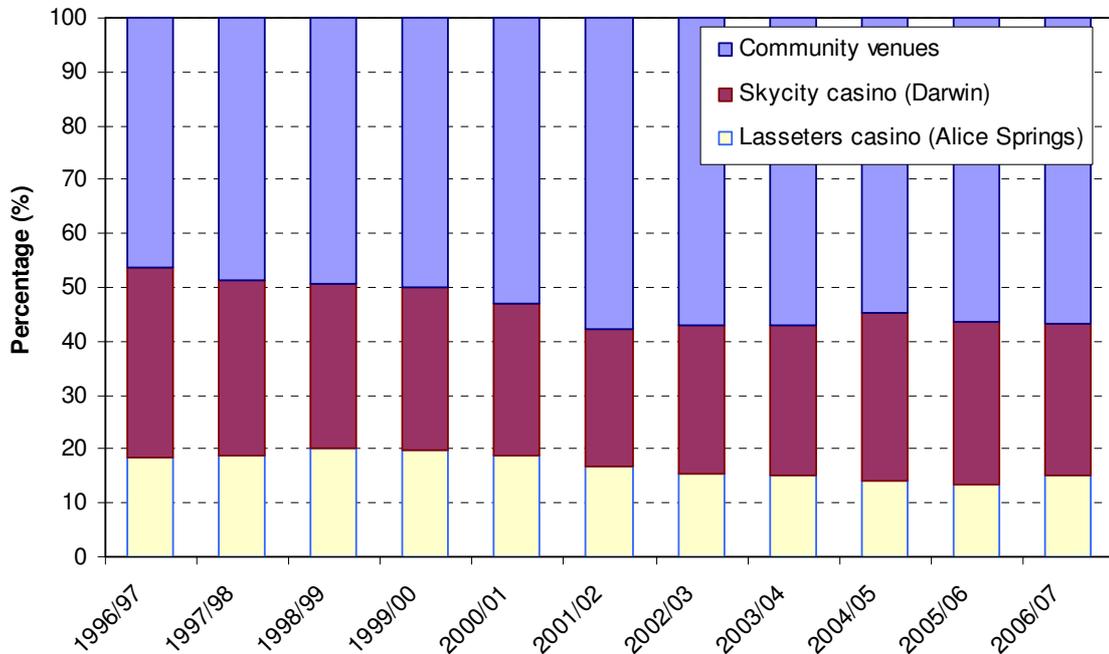


Figure 2.2. Percentage of total number of EGMs by gambling venue

2.4 Changes in total player loss

The total player loss (deflated to 1996 AUD) increased by 154% from \$44.02 million in 1996/97 to \$112.0 million in 2006/07 (Figure 2.3). The increasing trends for total annual player losses are roughly parallel between the casinos and community venues. However, the percentage increase was significantly larger for community venues (210% - \$16.02 million to \$49.76 million) compared to the growth for the two casinos (122% - \$28 million to \$62.7 million). The higher relative increase in total player loss for community venues translated into an increased share of total player loss from 36% in 1996/97 to 44% in 2006/07.

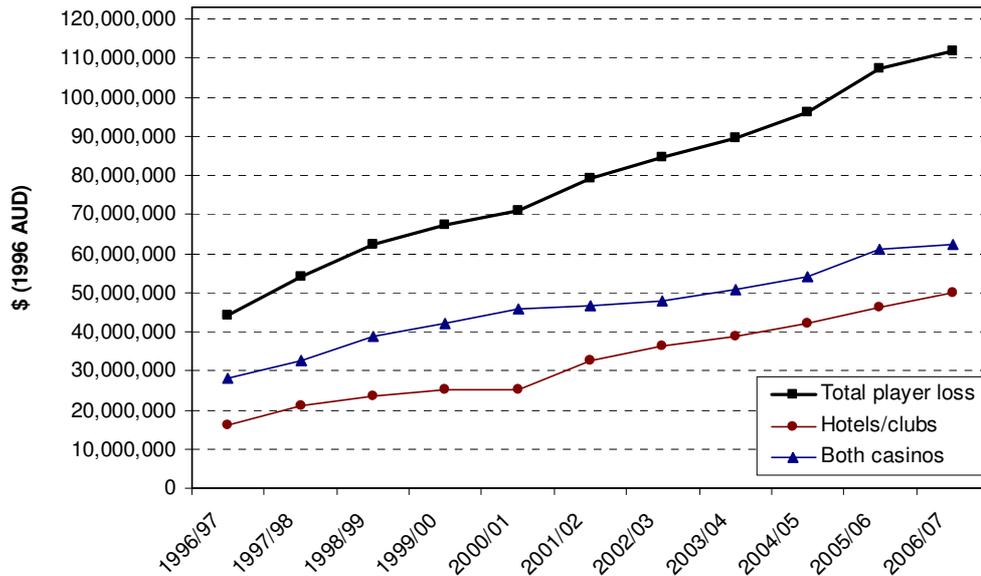


Figure 2.3. Total player loss (deflated to 1996 AUD) by gambling venue

2.5 Changes in player loss per machine

This growth in total losses was a function not only of the increasing number of EGMs, but also of the average profitability of individual machines. Average player loss per EGM increased steadily (in real 1996 terms), from a base of \$40,996 in 1996/97 to \$58,332 in 2006/07 (an increase of 42%) (Figure 2.4). Average player loss per EGM increased by 53% for casino based EGMs from \$48,700 to \$74,800 over the ten year period. Average player loss for EGMs located in community venues increased 42% from \$32,100 to \$45,700. Increases in the average player loss per EGM reflect the increased profitability associated with increasing marginal returns to scale, where a higher number of machines in a venue increases overall machine profitability.

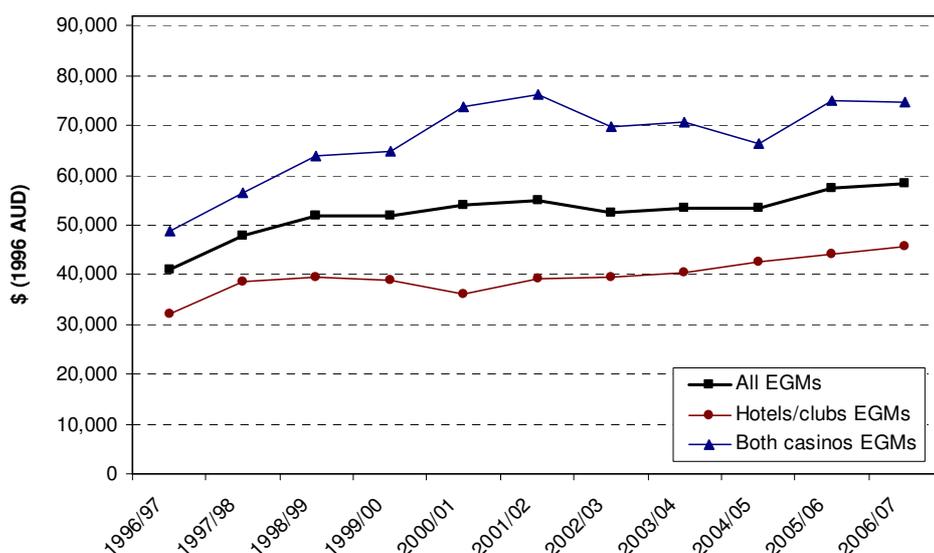


Figure 2.4. Average player loss per machine (deflated to 1996 AUD) by gambling venue

Chapter 3. Spatial Analysis of EGM Expenditure ‘Hotspots’

3.1 Rationale and scope

The increase in the accessibility of EGMs to the broader NT population documented in Chapter 2 is of policy concern because EGM participation, and the problem gambling with which it is associated, is partly determined by market proximity to venues (Baker & Marshall, 2005; Doran, McMillen, & Marshall, 2007; Marshall, McMillen, Niemeyer, & Doran, 2004). In other words, the wider the spatial distribution of EGMs, the more people live close to an EGM venue, with a resultant increase in accessibility and the potential for negative social impacts. To add another dimension, this spatial relation has proven to be regressive in the major urban markets. That is, there exists a negative relationship between the number of machines in an area and the socioeconomic status of that area (Doran et al., 2007; Marshall, 1999, 2005; Marshall & Baker, 2001a, 2001b, 2002; Marshall et al., 2004; Productivity Commission, 1999; South Australian Centre for Economic Studies, 2005). However, this relationship does vary at the local scale of analysis (McMillen & Doran, 2006). As a case in point, previous research in the NT has failed to establish an area-level association between EGM numbers or expenditure and socioeconomic status largely because of the spatial heterogeneity of local areas in the NT (Young et al., 2006). Thus, an understanding of the socio-spatial configuration of EGM provision in the NT warrants closer investigation.

To shed light on the geography of EGM growth in the NT, this Chapter presents a spatial and temporal examination of EGM expenditure trends in the main urban centres of Darwin and Alice Springs on a venue by venue basis over a five year period. These patterns are interpreted with reference to other spatial infrastructure including urban and residential development patterns, transport routes, and facilities of community congregation (Marshall, 2005; Young, Tyler, & Lee, 2007).

3.2 Spatial relationship between venues and social contexts in the NT

In terms of the relationships between venues and their local populations, the NT presents an interesting case. Previous research in the NT found no relationship between the location of clubs and hotels and the level social disadvantage of the statistical local areas (SLAs) in which they were situated (Young et al., 2006). There are several reasons for this. First, because of high population mobility, both Indigenous and non-Indigenous (Memmott, Long, & Thomson, 2006), venues in the NT are likely to have more extensive catchments than those found in the larger metropolitan areas. Second, venues in the NT are relatively small and have fewer options for machine transfer between them, resulting in a spatially rigid supply structure. Third, EGMs were introduced into a pre-existing spatial structure of establishments. Consequently, venue location generally reflects the location of a previous establishment (i.e. supply) rather than the social characteristics of the surrounding area (i.e. demand). In this context, a supply-side investigation of EGM patterns may be useful in understanding the development of spatial patterns of EGM provision over time as well as explaining the factors which influence these patterns. To this end, the current Chapter presents a spatial and temporal examination of EGM

expenditure trends in the main urban centres of the NT on a venue by venue basis over a five year period (2002-2007).

Four research questions are posed:

- How is EGM expenditure spatially distributed across venues in the NT?
- How has this spatial pattern evolved over time?
- What is the effect of seasonality on this pattern?
- Which factors explain the spatio-temporal patterns observed?

3.3 Kernel-density estimation

A Geographic Information Systems (GIS) approach, using kernel density analysis, was used to investigate the spatial distribution of EGM expenditure on a venue by venue basis. This involves creation of a GIS grid and, for each cell in the grid, generation of a search neighbourhood based on a band-width selected by the researcher. The expenditure values for each venue inside the search radius are summed and divided by the area of the neighbourhood (Mitchell, 1999, p.78). The output consists of kernel density maps which may be displayed in two or three dimensions and which represent expenditure 'hotspots'. To maintain consistency and prevent any potential misinterpretation of the final kernel density outputs, the expenditure values were deflated to the equivalent 1996 AUD (the year EGMs were first introduced into NT community venues). The deflation was performed on each month using the quarterly Consumer Price Index (CPI), available on a regional level for capital cities inclusive of Darwin (Australian Bureau of Statistics, 2008a). The analysis was performed with the ESRI ArcGIS 9.2 spatial analyst extension.

The expenditure data were provided by Licensing and Regulation, NT Department of Justice, in the form spreadsheets compiled from government monthly *Gaming Machine Performance Tables*. These data comprised EGM numbers and monthly player loss data from June 2002 to December 2007 (i.e. a 66 month series) for each of the venues currently operating in the NT. Data before this time (i.e. 1996) was not available to the research team as it was collected using a superseded system.

Only the Alice Springs and Darwin/Palmerston areas are reported in this Chapter for two reasons. The spatial magnitude of the NT and the distribution of venues meant that kernel density analysis at the NT regional scale would be relatively uninformative, rendering no more than several peaks on a vast canvass. However, the analysis was informative at the level of the urban centre. As Darwin/Palmerston and Alice Springs contain the bulk of the community venues (i.e. 41 for Darwin/Palmerston and 10 for Alice Springs) which account for 69% of the community venue EGM expenditure for June 2007, these localities provide an appropriate focus for an exploratory investigation.

3.4 Distribution of EGM venues in the Northern Territory

The introduction of EGMs into community venues has dramatically altered the accessibility of gambling to the NT population (see Figure 3.1). While before 1996 EGMs were only available in the Darwin and Alice Springs casinos, they have since been made available in the smaller centres of the NT including Katherine, Tennant Creek, Nhulunbuy and Jabiru (Figure 3.1) as well as far more extensively in the Darwin region (Figure 3.2) and Alice Springs (Figure 3.3).

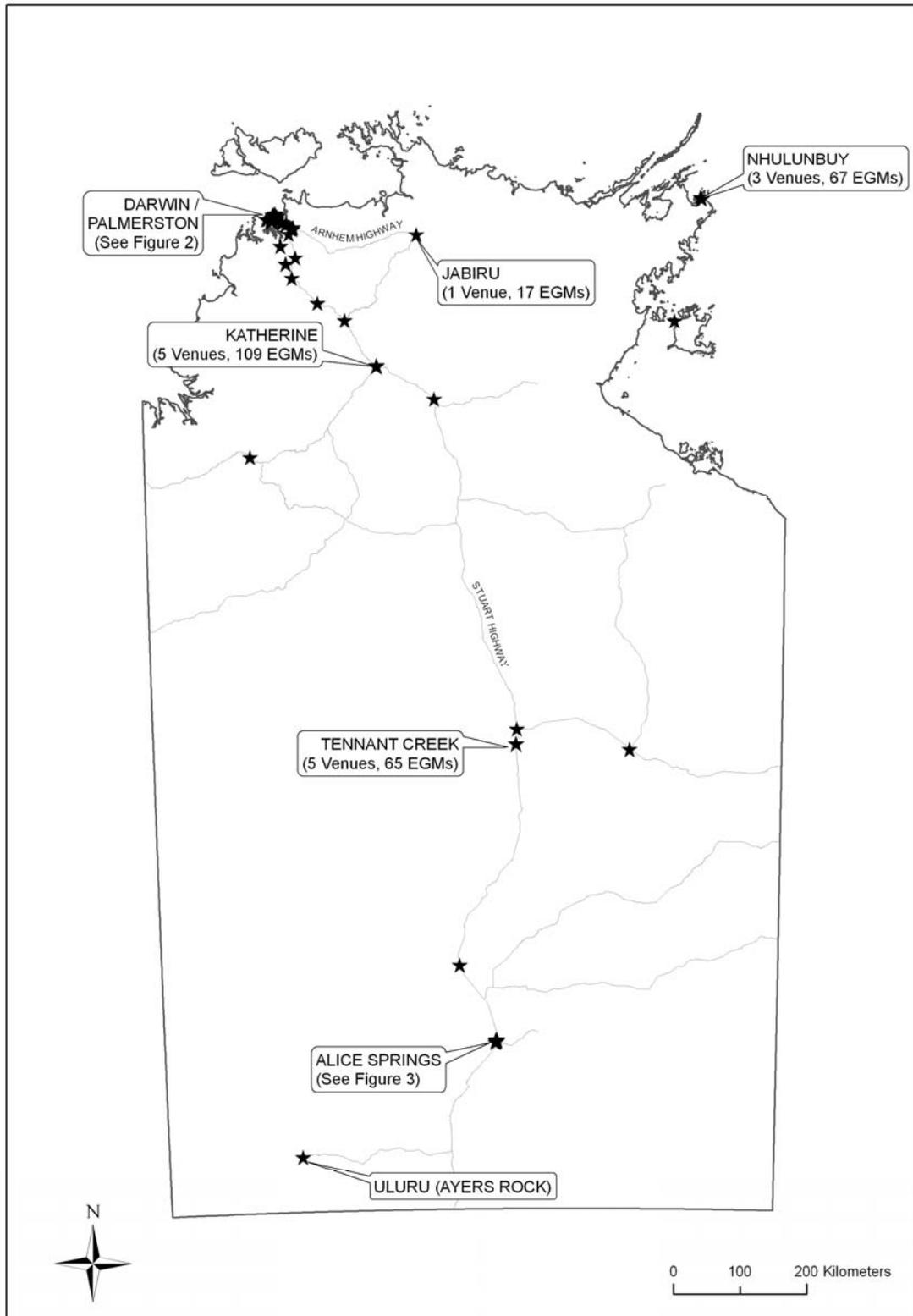


Figure 3.1. Location of Northern Territory EGM venues

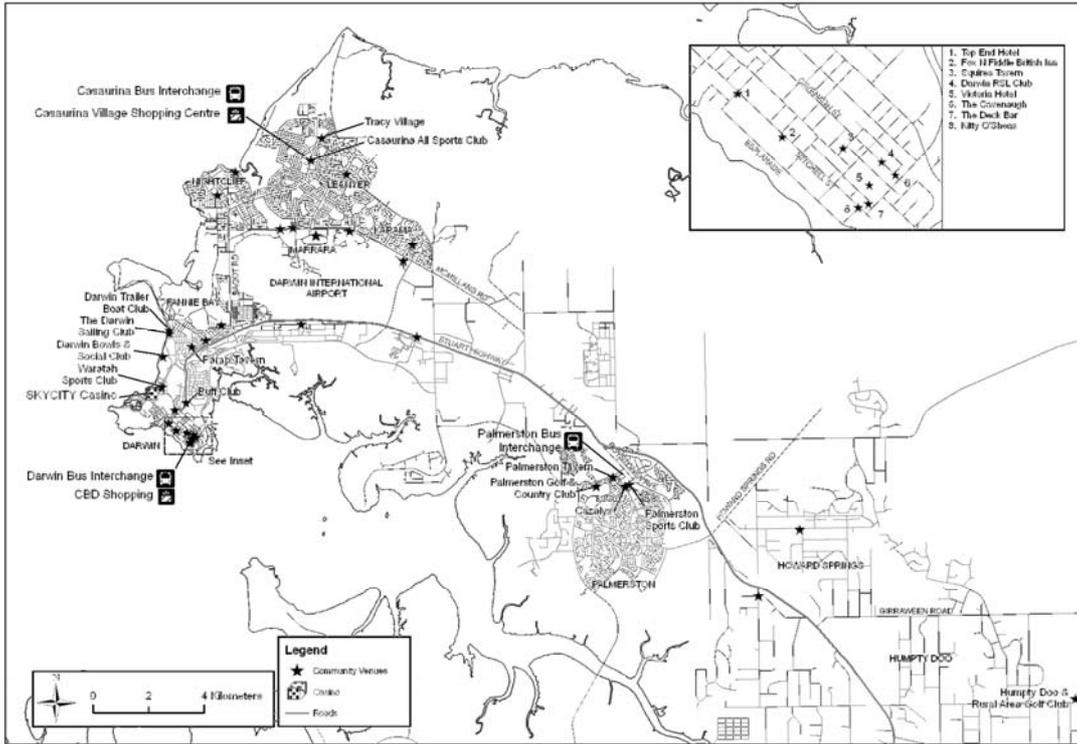


Figure 3.2. Location of Darwin EGM venues

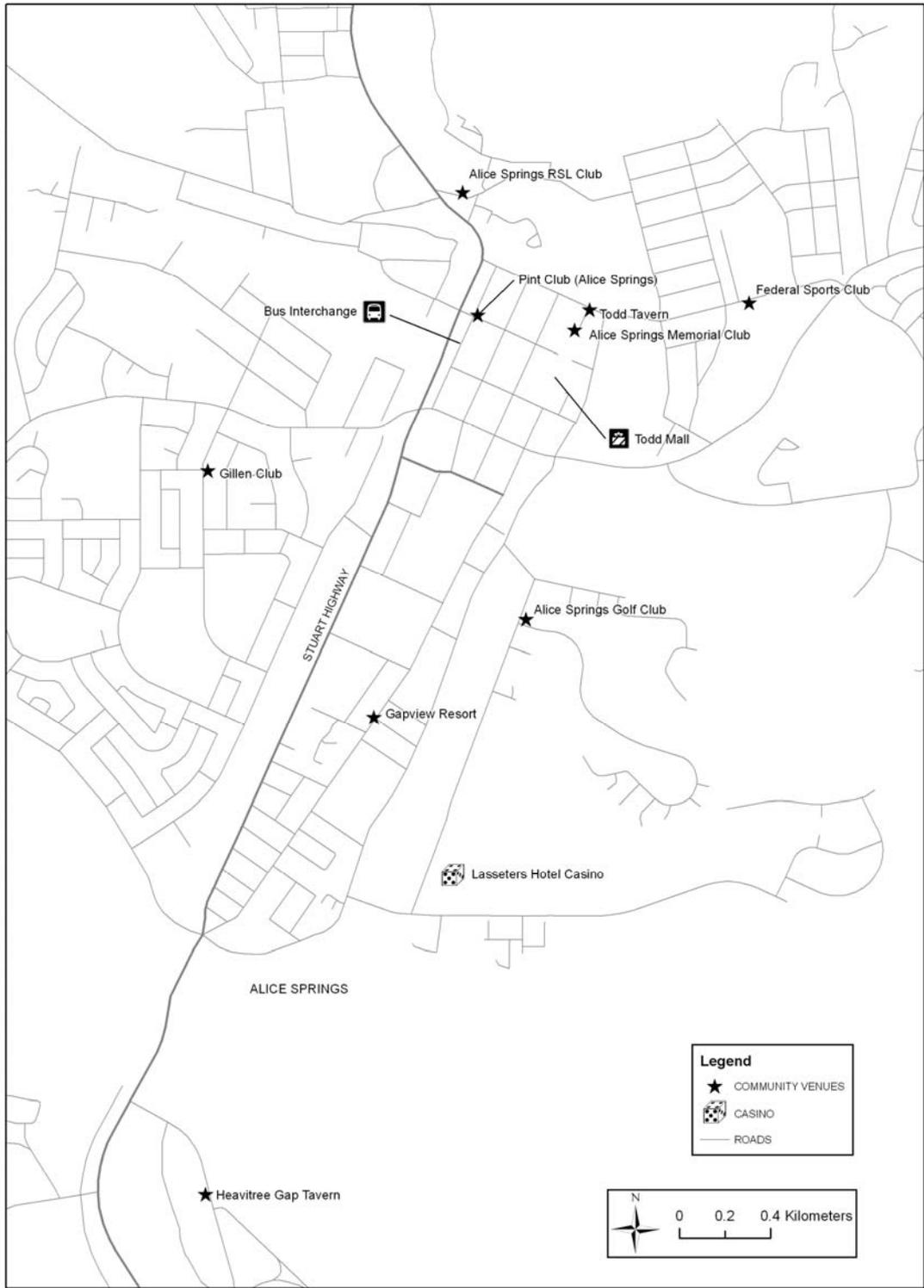


Figure 3.3. Location of Alice Springs EGM venues

3.5 Darwin EGM expenditure patterns 2002

The two-dimensional kernel density map for the start of the time series (i.e. July 2002), reveals a tri-modal spatial distribution of expenditure (Figure 3.4). The three main areas of expenditure intensity include the northern suburbs, the city centre, and the inland, satellite town of Palmerston. The relative intensity of these expenditure “hotspots” are also evident in the three-dimensional view for July 2002 (Figure 3.5).

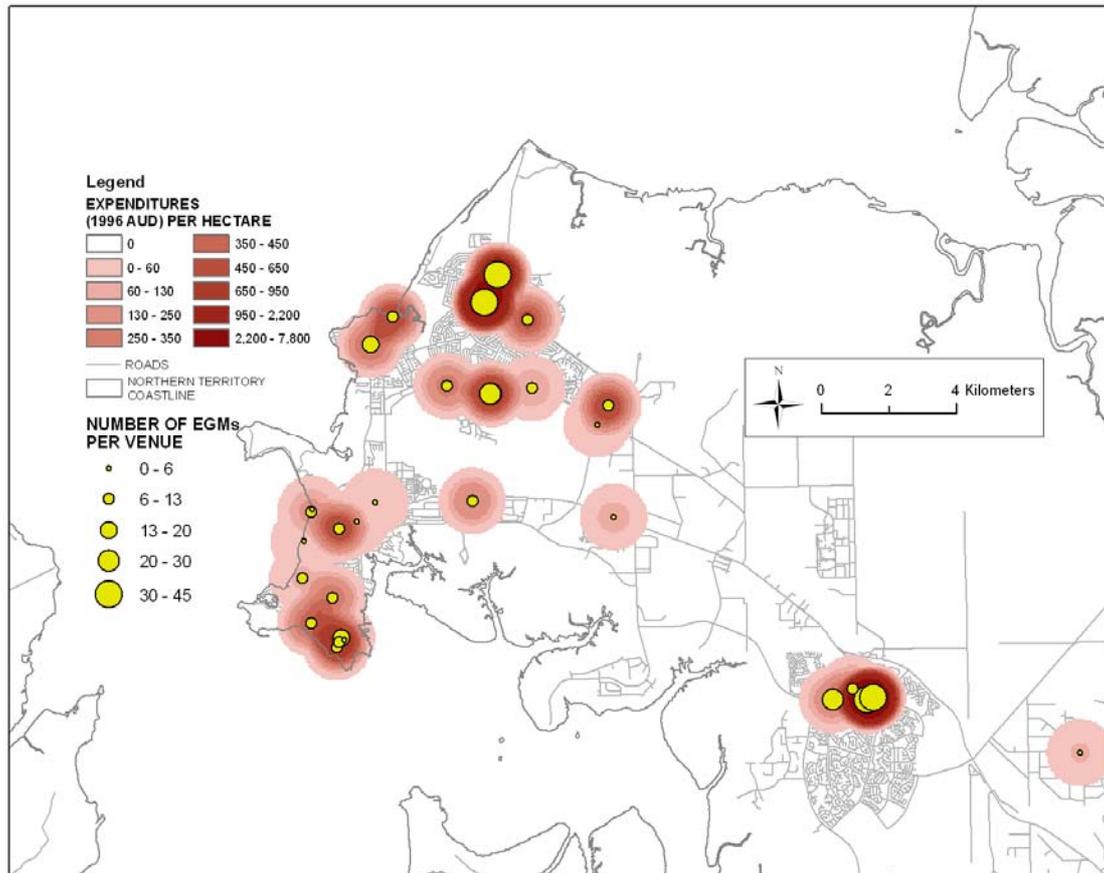


Figure 3.4. Darwin EGM venues and expenditure July 2002

The expenditure “hotspot” in the northern suburbs coincides two of Darwin’s largest clubs – the Casuarina All Sports Club and Tracy Village. In 2002 both of these clubs had recently installed their maximum permissible number of 45 machines. The success of these venues may be related to their relative accessibility. The Casuarina Club is located adjacent to Darwin’s main suburban shopping mall, Casuarina Village. In addition to the 200 shops within the mall complex, the area offers a range of auxiliary facilities including Centrelink, banks and public health providers. It is serviced by an arterial road and hosts the city’s largest bus interchange linking the mall with the Darwin CBD and Palmerston (Figure 3.2). Tracy Village, located one kilometre away from the mall, is still accessible by bus or short private vehicle or taxi ride. Both these clubs are located within the main residential belt of Darwin (i.e. the northern suburbs) which constitutes a large and proximate local market. The northern suburbs expenditure hotspot is surrounded by several smaller hotspots which coincide

with a range of pubs and smaller clubs that are located away from large areas of community congregation. However, these smaller expenditure hotspots are nonetheless proximate to smaller areas of community congregation including the Marrara sporting complex (a number of football clubs); Nightcliff (a relatively affluent suburban area on the coast with beachfront entertainment facilities); and Leanyer and Karama (two suburbs that are serviced by small local shopping centres with EGM venues).

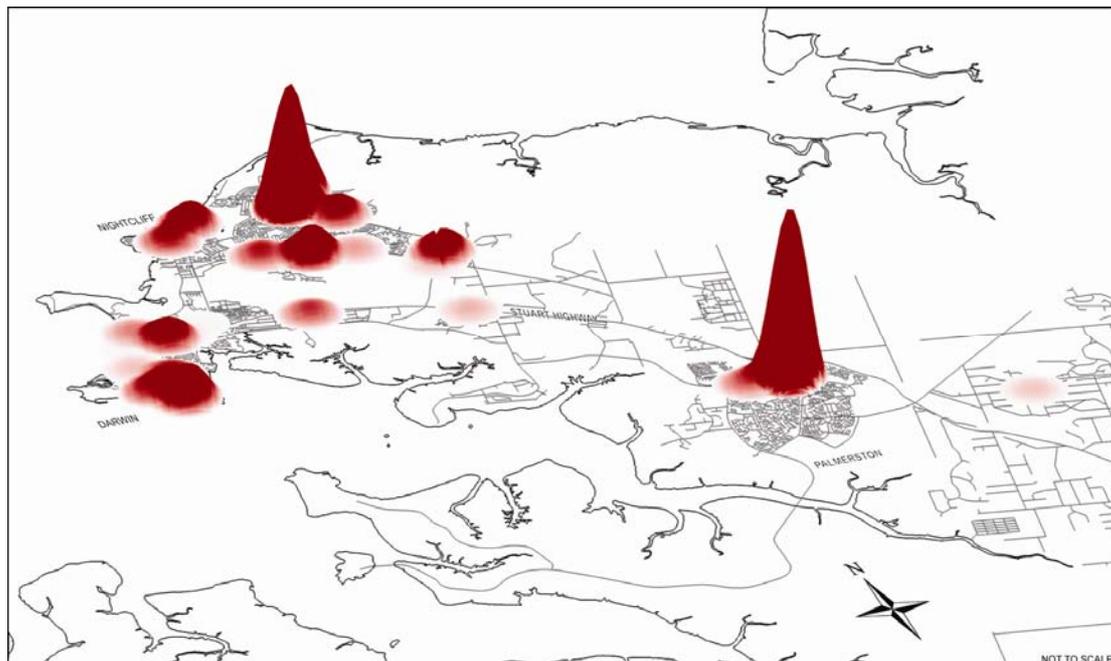


Figure 3.5. Darwin EGM expenditure July 2002

By comparison, EGM expenditure hotspots in the city centre are less intense, comprising a small concentration in the CBD and an even smaller one to the north. At this time the CBD hosted several smaller establishments (i.e. hotels) which are permitted a maximum of 10 machines. The expenditure hotspot to the north coincided with a number of clubs (i.e., Waratah Sports Club, Darwin Bowls & Social Club). This distribution may reflect the number of smaller venues in this area, where gambling is largely incidental to the main business of the venue. This pattern suggests a form of dispersed, convenience gambling where EGMs are offered in addition to other entertainment options available in Darwin’s nightlife strip along Mitchell Street, coffee shops, restaurants and bars. In other words, these smaller venues draw on the existing mix of landuses in the entertainment zone and take advantage of the temporally and socially heterogeneous market it attracts.

The most visually distinctive expenditure hotspot in the Darwin area is located in the satellite town of Palmerston (Figure 3.5). It coincides with several clubs (i.e. Cazalys, Palmerston Golf & Country Club and Palmerston Sports Club) as well as a hotel (the Palmerston Tavern) which together hosted all of Palmerston’s EGMs in 2002. This concentration may be explained in several ways. First, as Palmerston does not have a casino, local residents may use the large clubs as an alternative. Second, there are fewer recreational outlets in Palmerston compared with Darwin and clubs may consequently play a more significant social role than elsewhere. Third, as is

typical of satellite towns, Palmerston is characterised by lower socioeconomic status than the main urban centre (Australian Bureau of Statistics, 2008b). This may produce a stronger local EGM market (Marshall & Baker, 2001a, 2002). Finally, while there are several intervening opportunities for gambling located on the Stuart Highway between Darwin and Palmerston, there appears to be a cut-off point after which these opportunities cease. It is possible that the catchments for the venues in the Palmerston are relatively localised and have little spatial overlap with venues within Darwin itself.

3.6. Darwin EGM expenditure patterns 2007

A number of distinctive changes are evident in the core expenditure hotspots emerging from the kernel density analysis between July 2002 and June 2007 (Figure 3.6). The intensity of the northern suburbs concentration increased significantly over time. Given that EGM venues in this area had reached the capping limit in 2002, this increase in intensity was mostly likely due to a rise in player loss per machine. Real player loss per EGM for venues in this area increased from \$4,221 in July 2002 to \$5,284 in July 2007. These trends suggest that it is likely that this expenditure hotspot would be even larger and more intense if the capping limit was relaxed. In addition, the smaller hotspots surrounding the main northern suburbs peak increased slightly, particularly in the Nightcliff area.

The intensity of the CBD expenditure hotspot also increased substantially in real terms, reflective of a change in the number of venues which increased from three in July 2002 (i.e. the Darwin RSL Club, Kitty O'Sheas Bar & Grill, Victoria Hotel) to seven in June 2007. The new venues included four smaller entities including the Cavanagh, the Deck Bar, Fox N Fiddle, and Squires Tavern/Time Nightclub. This increase in EGM expenditure also coincided with higher returns per machine. The average player loss per machine of \$2,874 increased to \$3,492 by June 2007 (deflated to 1996 values). The CBD is an area characterised by EGM dispersal across venues, rather than by a concentration of large numbers in specific venues. In 2007 the CBD had 80 EGMs distributed across 7 venues, while the northern suburbs had 221 EGMs distributed across 11 venues. Thus, EGM growth in the CBD has displayed an agglomeration effect, where numbers have risen through the introduction of several smaller venues proximate to each other. In this spatial configuration, EGM venues comprise part of a broader leisure market as opposed to the larger, gambling-specific venues that have developed in the northern suburbs and Palmerston.

The largest real increase in EGM expenditure occurred in Palmerston. The player loss in the two main clubs of Cazalys and the Palmerston Sports Club (which combined have 90 EGMs), increased from \$6,156 in July 2002 to \$8,746 in June 2007. In essence, these clubs appear to have consolidated their positions over time.

Finally, the influence of two new venues which opened in the rural fringe, the Victoria Tavern and the Humpty Doo & Rural Area Golf Club is evident in the kernel density outputs. Given that Litchfield Shire, which incorporates the rural fringe of Darwin and Palmerston, is the fastest growing Local Government Area (LGA) in the NT, with a increase in ERP of 4.9% between 2006 and 2007 (Australian Bureau of Statistics, 2007b), it is not surprising that EGMs have spread into this rural-residential zone.

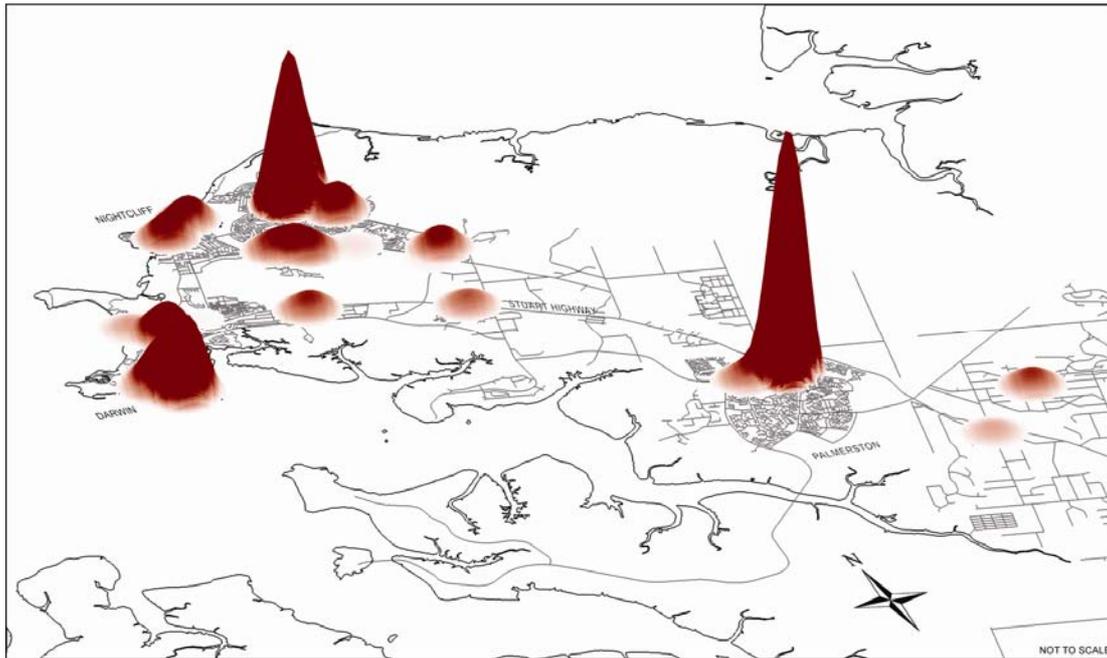


Figure 3.6. Darwin EGM expenditure June 2007

3.7 Seasonal variation in Darwin EGM expenditure

Not only has EGM expenditure varied over a 5 year period, it also displays marked annual variation. For example, Figures 3.7 and 3.8 show that the three-dimensional kernel density outputs for August 2006 (the busy winter, or dry, season) contrast strongly with those for January (the quiet summer, or wet, season). The expenditure is noticeably and uniformly higher for the peak winter month of August across the various EGM expenditure hotspots. This seasonality was consistent throughout the period of analysis and corresponds with general patterns of retail spending. During 2007, and leaving aside the Christmas peak, retail turnover for all industries in the NT was highest during August (\$220.9 million) and lowest during February (\$160.5 million) (Australian Bureau of Statistics, 2008c). However, any discussion of seasonality in the NT needs to account for population movements. During 2007, there were 787,000 visitors to the Darwin region, the majority of whom arrive during the winter months of June to September (Tourism NT, 2008). As an indicator, seasonally adjusted room occupancy rates for licensed hotels with 15 or more rooms were at their lowest in March (approximately 50%) and highest in September 2007 (approximately 80%) (Australian Bureau of Statistics, 2008d). While EGM expenditure patterns are likely to vary because of this population change, it is not clear how much expenditure is attributed to locals as opposed to visitors. For example, the peak in room occupancy does not correlate exactly with the lows and highs of EGM expenditure. As these figures do not include ‘visiting friends and relatives’ who are less likely to stay in commercial accommodation, variation in EGM expenditure could equally be a result of expenditure by local residents and their guests.

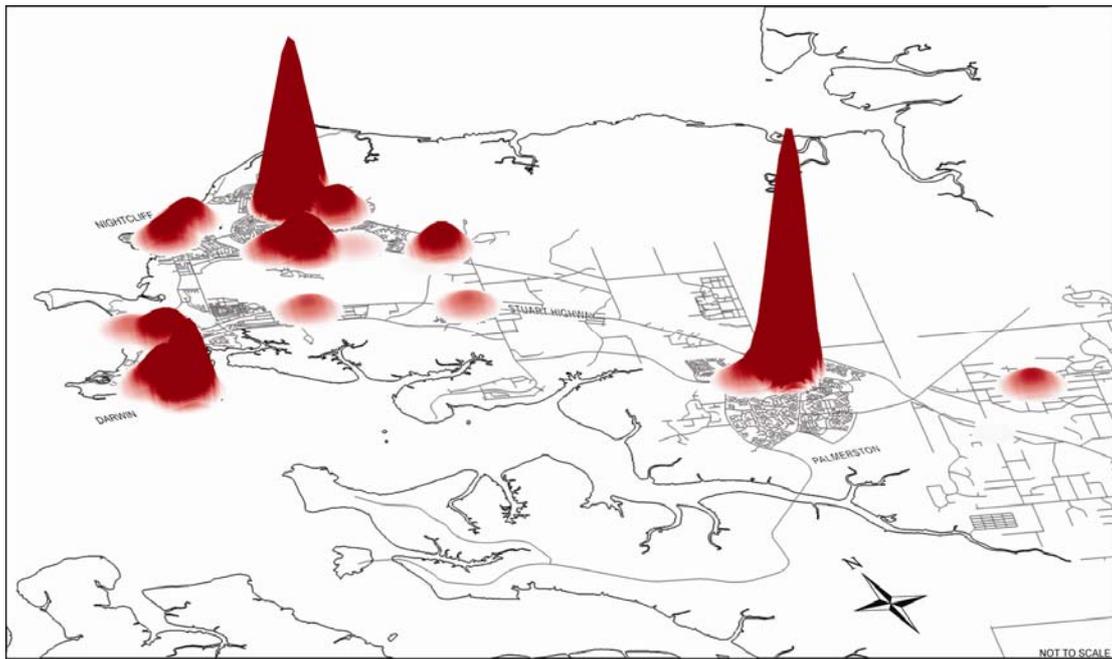


Figure 3.7. Darwin EGM expenditure August 2006

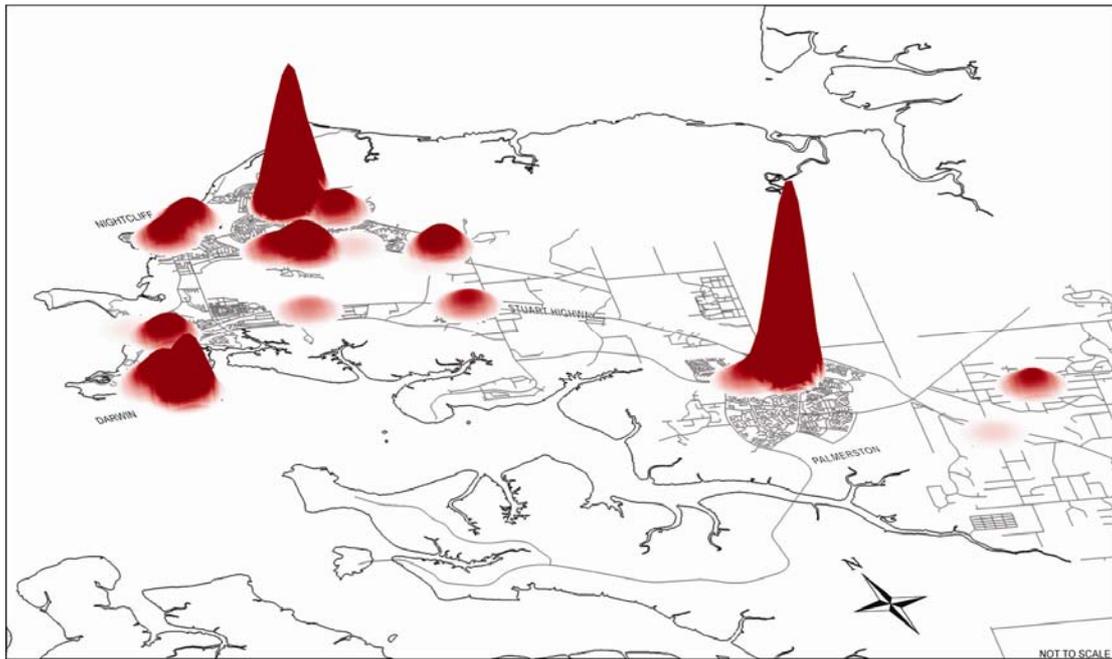


Figure 3.8. Darwin EGM expenditure January 2007

3.8 Alice Springs EGM expenditure patterns 2002

Figure 3.9 shows the location of EGM venues in Alice Springs. There were nine community venues with EGMs in June 2007 located largely near the CBD, with the exceptions of Gapview Resort, Gillen Club, Heavitree Gap Tavern, and Alice Springs Golf Club that have suburban locations. The two dimensional kernel density output for 2002 displays a single expenditure cluster with several smaller outliers (Figure 3.9). Figure 3.10 provides a three dimensional view where it is evident that there is one dominant expenditure peak in the area. The Alice Springs Memorial Club is the main contributor to this peak with 40 EGMs in July 2002, supported by the PINT Club (10), Federal Sports Club (10), Todd Tavern (10), and Alice Springs RSL Club (17). The three surrounding smaller peaks are coincident with Gapview Resort, Gillen Club and Heavitree Gap Tavern. This pattern of high EGM expenditure in the town centre may be a reflection of its modest size, lack of large suburban tracts, and accessibility of the CBD to the resident population.



Figure 3.9. Alice Springs EGM venues and expenditure July 2002

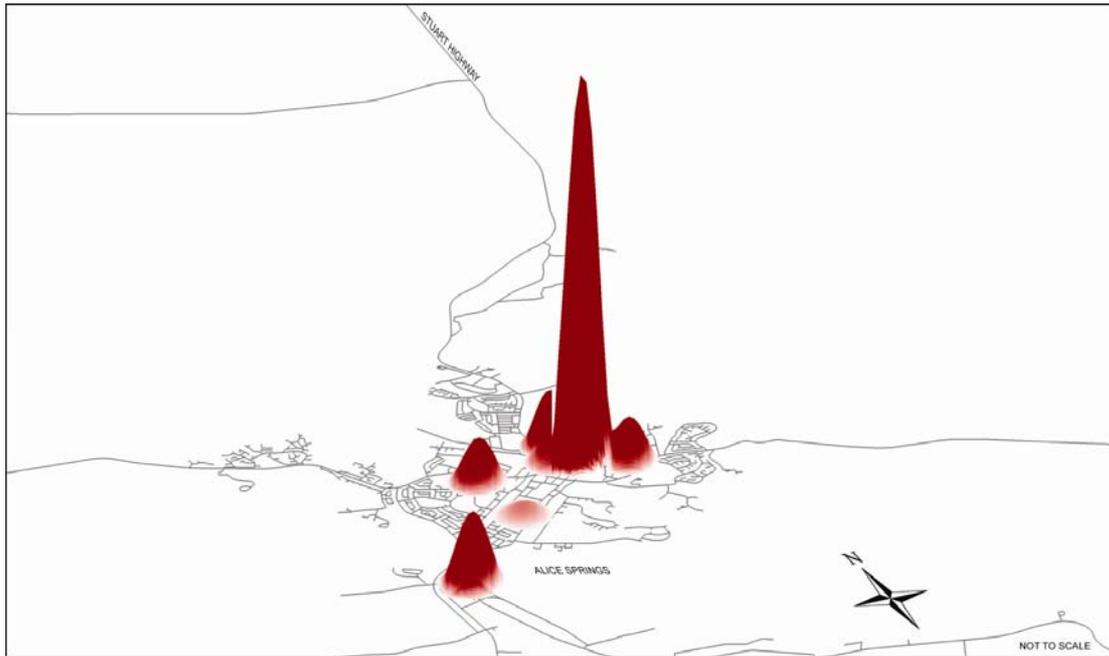


Figure 3.10. Alice Springs EGM expenditure July 2002

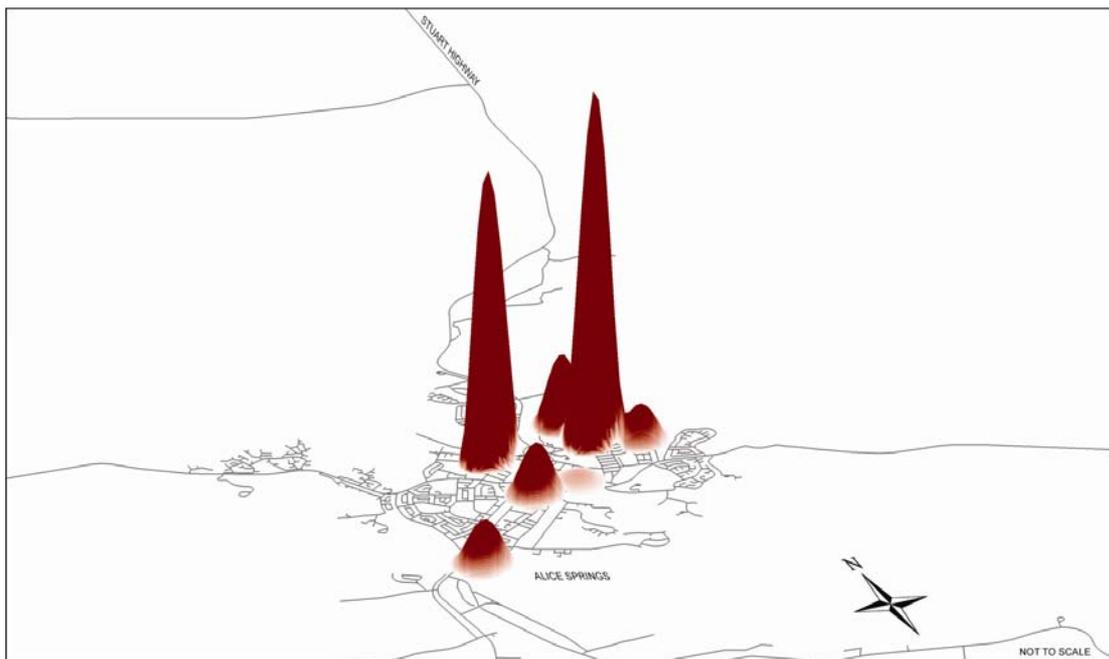


Figure 3.11. Alice Springs EGM expenditure June 2007

3.9 Alice Springs EGM expenditure patterns 2007

Five years later a dramatic change had occurred (Figure 3.11). In October 2004, a second club (the Gillen Club) increased its EGM numbers in October 2004 from 16 to 40, which produced a second expenditure peak. While not displayed here, this introduction appeared to cause a reduction in EGM expenditure in its main competitor, the Alice Springs Memorial Club, whose EGM revenues dropped from \$160,756 in October 2004 to \$105,456 in November 2004, a difference of \$55,300.

This reduction appears not to have been due to seasonal variability, as the consistent seasonal drops occur during December and January. Over the past three years, EGM expenditure in the Gillen Club has steadily increased and the expenditure in the Memorial Club has recovered suggesting that expenditure in both clubs has grown to levels dictated by the capping limit.

In Alice Springs there appears to be an interaction between location, EGM numbers and expenditure as evident in the case of the PINT (Postal Institute of the NT) Club. This venue enjoyed a seemingly ideal location, being proximate to the CBD's Todd Street Mall and the Stuart Highway, yet only had 10 EGMs in July 2002 (Figure 3.3). Despite this, the PINT Club closed in July 2004. In contrast, there are two venues in the area (i.e. Federal Sports Club, Todd Tavern) that had the same number of EGMs and managed to remain operational for the full period of analysis in the presence of the seemingly-dominant Memorial Club. It is possible that the location of the PINT club relative to its competitors caused its demise. To the south, there were a number of small venues that may have been able to attract potential customers prior to reaching the northern part of town (i.e. the Gillen Club and Lasseters Hotel Casino). To the north of the PINT Club is the RSL club, located along the Stuart Highway which, similarly, may have presented enough pull to siphon off any potential customers coming from the north along the highway. In contrast, the venues located in the Todd Mall CBD (i.e. Todd Tavern, Alice Springs Memorial Club) may have remained viable due to the attractive power of the larger venues and other auxiliary services. Admittedly, this is a purely spatial analysis of the clubs closure and other additional factors may very well have been involved.

3.10 Seasonal variation in Alice Springs EGM expenditure

Figures 3.12 and 3.13 display the extent of the seasonal variation in EGM expenditure in Alice Springs (the comparator months chosen for Darwin, August 2006 and January 2007, were reemployed). Similar to Darwin, there was significant variation between the summer and winter months. Again this variation is most likely due to a combination of local expenditure patterns and the seasonal influx of tourists on a small population base.

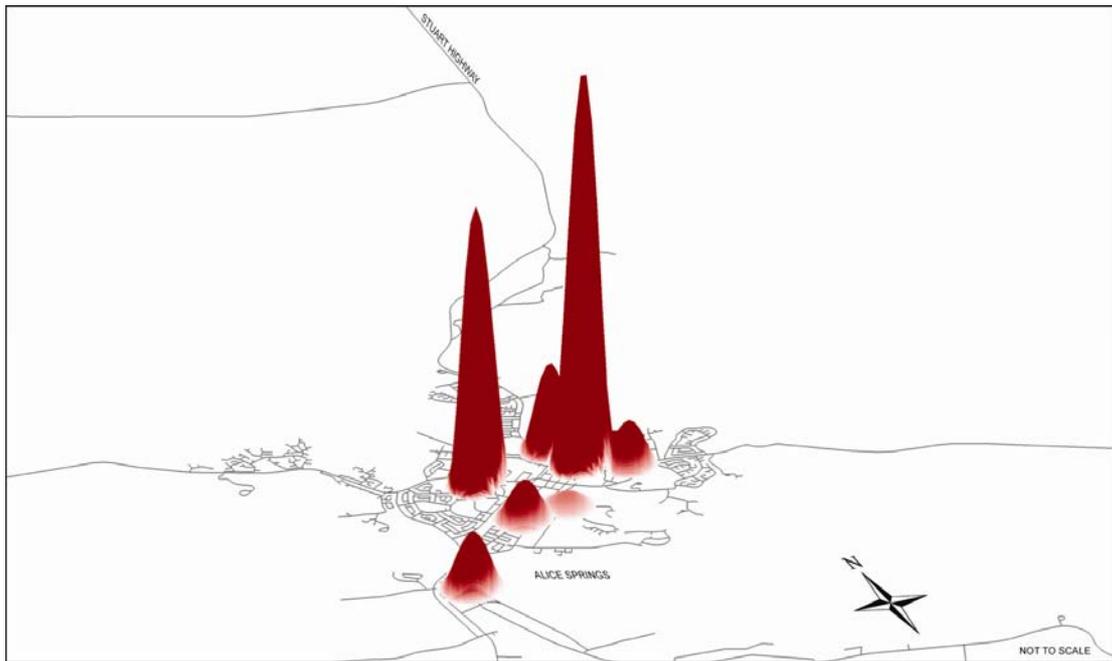


Figure 3.12. Alice Springs EGM expenditure August 2006



Figure 3.13. Alice Springs EGM expenditure January 2007

3.11 Patterns of EGM expenditure in the Northern Territory

While the specificities of EGM expenditure have been explored in two urban contexts, the emergent spatial patterns and changes over time suggest three general types of development that may be more broadly relevant:

1. *Suburban gambling complexes* (i.e. northern suburbs of Darwin and Palmerston) describe the small groups of large clubs that possess the maximum permissible number of EGMs (i.e. 45). These venues have considerable attractive power in their own right and may be considered gambling ‘destinations’, where the activity of gambling in itself is a significant drawcard (Young & Tyler, 2008; Young et al., 2007). These venues may rely on their location near existing large areas of community congregation (e.g. Casuarina Mall and the Casuarina Club) as well as nodes in the transport network (e.g. Casuarina and Palmerston bus interchanges and arterial roads). However, due to the capping limit, increased profitability has not been derived from an increase in EGM numbers, but from an increase in real player loss per machine. This growth may be attributed, in part, to the competitive advantages of scale including the ‘buzz’ generated by the number and variety of machines, the linking of jackpots, provision of other gambling products (i.e., keno, raffles and race-betting) and internal marketing strategies. Larger clubs are also able to provide and promote other visitation incentives such as player loyalty schemes, cheap meals, entertainment, SkyTV, and childminding facilities. These venue strategies suggest a form of supply-led growth in EGM expenditure, where the characteristics of the venue and its accessibility to markets are influential (Marshall et al., 2004).

2. *City-centre gambling agglomerations* describe the clustering of a number of smaller gambling venues in and around the CBD (e.g. Darwin and Alice city centres). In contrast to the suburban complex, these venues may rely more heavily on the pulling power of the surrounding facilities rather than their individual attractive power. They comprise a highly provisioned gambling/entertainment zone, and possibly benefit from the attractive power such zones provide. In these precincts, EGM gambling is more likely to be supplementary to other activities rather than comprising a principle drawcard in its own right, potentially depending more on convenience than premeditated intent to gamble on the part of the player.

3. *Opportunistic gambling nodes* describe those venue(s) that take advantage of their location to specific local markets (e.g. the expenditure hotspots in Nightcliff, Marrara and the Darwin rural fringe). Venues in such locations may attract passing trade or service defined residential areas. They consist of small venues that potentially rely on the advantages conferred by a particular location. If this is the case, they differ from the venues in the CBD agglomerations in that they are less dependent on the attractions of an entertainment complex, and rely more on their own relative attractive power linked to location and a micro-level accessibility relationship to markets.

3.12 Temporal patterns of EGM expenditure

Temporal analysis of these spatial patterns revealed two general trends. Firstly, EGM expenditure has steadily increased in real terms. Even though there are more venues and EGMs, average player loss per EGM has continued to rise. This suggests that there is still significant latent demand for community-based EGMs in the NT. The suburban gambling complexes appear best suited to tap into this demand through supply-led advantages associated with location and venue scale. Second, the pattern of expenditure is markedly seasonal. This is most likely due to a combination of local spending and travel patterns, as well as the effect of a large visitor population. However, further research is required to determine the proportion of expenditure attributable to visitors. Indeed, a number of further research directions flow from the current study.

3.13 Implications for research

It would be useful to know the extent to which the spatial patterns identified in Darwin and Alice Springs occur in other regional centres. The fact that distinct spatial patterns of EGM development emerge suggests that gambling management may be usefully informed by the development of a typology of venues based on the characteristics and relationships to markets (e.g. proximity to shopping centres and transport corridors, venue size, number of EGMs, distribution of competitors, level of community engagement, structures of ownership and control, marketing strategies). Such a typology could inform regulatory decisions along with the social impact assessment of new license applications (Young & Tyler, 2008).

It is also evident from this analysis that the relationship of venues to their social catchments (i.e. the demand side) requires more attention. While previous research has identified the socioeconomic status of catchments as significant, in the case of the NT, a spatial correlation between socioeconomic status is not immediately evident, although a case could be argued for Palmerston and some Darwin suburban venues. Further research into the size and composition of venue catchments in the heterogeneous context of the NT will enable an assessment of the link between social disadvantage and EGM participation.

The results from this study also suggest that further temporal analysis may be beneficial. While this paper has explored seasonality in EGM expenditure, investigation of shorter timeframes (i.e. weekly and daily patterns) would provide insight into the temporal accessibility of EGMs (Baker & Marshall, 2005). For example, it is likely that the *city centre gambling agglomerations* attract a different, and more nocturnal, clientele to the large suburban clubs. Patrons are screened to different degrees by gate-keeping practices in clubs through the use of dress standards at certain times of the day.

A fourth area where more investigation is required is into patterns of EGM usage in remote towns such as Tennant Creek, Nhulunbuy, Jabiru and Katherine. Kernel density modelling is a less effective technique in these contexts as, due to the small size of these settlements, it produces a single peak which is of less interpretive value than the results presented above. However, these centres service vast areas that are home to spatially and socio-economically disadvantaged populations, as well as the largely remote Indigenous population (Australian Bureau of Statistics, 2007a).

The effects of the introduction of globalised gambling culture into these regions will only be assessable through observation and locally-relevant interview/survey studies conducted with venue patrons. Finally, community venues exist alongside casinos in both Darwin and Alice Springs. The competitive relationships between these sectors is worthy of further research. To date, community venues do not appear to have detracted significantly from casino revenues. Over the past decade the two casinos have outperformed the community sector in terms of total machine revenue, average revenue per machine, and stability of revenue throughout the seasonal cycles, suggesting there has been little ‘cannibalism’ (i.e. demand substitution) (Walker & Jackson, 2008; Young et al., 2006).

3.14 Implications for harm minimisation

Given EGM development displays a complex set of spatial relationships with markets, it is unlikely that a generic capping policy will be particularly effective in minimising the harm associated with gambling. Attention to the spatial configuration of EGM supply allows for a more consistent, and geographically sensitive, policy response in terms of harm minimisation. For example, it is likely that *city-centre gambling agglomerations* will generate the most demand for expansion through numerous small applications as the entertainment zones of consumption develop. On the other hand, *suburban gambling complexes* tend to dominate their local areas by way of their competitive advantage. However, as the case of the Gillen Club in Alice Springs appears to demonstrate, existing clubs are not immune from the effects of competition, but currently this is only made possible by capping restrictions which limited the size, and hence competitive power, of the larger venues.

These development patterns will produce different sets of social impacts. For example, it is clear that Palmerston is highly provisioned with EGMs, and given its distance from Darwin, most likely drawing clientele from the local area. The growth in this relatively socially disadvantaged area is suggestive of the link between vulnerable populations and EGM expenditure identified by previous research (Marshall, 1999; Marshall & Baker, 2001a, 2001b, 2002; Productivity Commission, 1999; South Australian Centre for Economic Studies, 2005). Assessing these relationships will require a move towards an impact assessment framework that is sensitive to venue differences, the pattern of EGM distribution, and its relationship to the social characteristics of catchments. While the current Chapter provides a valuable spatio-temporal description of EGM expenditure patterns over the last five years, the socio-spatial characteristics of venue catchments remain largely conjectural. Until research is conducted that involves patron surveys, spatial configuration of the link between socioeconomic status, EGM expenditure and gambling risk in the NT will remain unclear. The final Chapter turns attention more specifically to EGM venues and the local areas in which they are located.

Chapter 4: A Typological Analysis of Community Venues

4.1. Rationale and scope

This Chapter examines ways in which the development of an empirically-derived typology of hotels and clubs might inform the development of licensing policy in the NT. It argues for the importance of a venue-centric approach to the implementation of any capping regime for EGM numbers, whether at the jurisdictional, regional or venue-type (hotel/club) level.

The results of the socio-spatial analysis of EGMs conducted as part of the *2005 Prevalence Report* clearly indicated that the inverse relationship between socio-economic resources of an area and EGM expenditure found in other jurisdictions did not apply in the NT context. This means that measures of socio-economic status of an area alone are unable to be used as a basis for gaming machine policy as has been done, for example, in Victoria. This raises the question of whether improved explanations may be developed for the observed pattern of gaming machine outcomes recorded by the EGM player loss database beyond a concern with the socioeconomic status of the local area. This, in turn, is part of a broader question of how to understand outcomes for individual venues in more meaningful ways, in order to explain gaming machine expenditure and to inform appropriate licensing policy. This Chapter will start to answer this question by comparing outcomes between venues in the context of gambling, location, and socio-demographic variables. In particular, it will develop a classification system, or venue typology, that will allow the consideration of groups of similar venues, rather than attempting to understand them as a single entity.

The first section (section 4.2), reviews capping policies in the NT and elsewhere, and opens up the debate over directions in the NT's licensing policy. This is followed by the development of an empirically-derived typology of NT community venue characteristics (section 4.3). These typologies (one for each venue sector) provide the basis for a systematic exploration of the social and economic differences among venues. The results of the typological analysis can then be applied to the development of EGM licensing policies and decisions in the NT (section 4.4). To conclude the Chapter, a policy-focused agenda is proposed for future research into the causal links between socio-spatial patterns of EGM gaming and levels of social harm in the NT (section 4.5).

4.2. Review of EGM capping policies

The recent media release on gaming machine policy by Dr Chris Burns, the NT Minister for Racing, Gaming and Licensing (Burns, 2008), sets out the terms and rationale for a "comprehensive package" for the capping the number of EGMs in community venues (i.e. hotels and clubs). The policy, taken on advice of the Licensing Commissioner, would put a cap on the existing number of machines in the NT at 1,190 and require all future licences to be issued from this pool. However venues would be allowed to trade machines to enable smaller venues to secure an income stream from more profitable locations. The rationale for this policy appears to be two-fold: (a) to reduce or limit the risk of social harm that EGMs may cause to the "lives of problem gamblers and their families"; (b) to reduce (by \$5.3 million or 18%

annually) the NT Government’s reliance on gambling revenue. The policy was supported by the claim that it was consistent with trends in other Australian jurisdictions. A centerpiece of the package was the intention to maintain the current cap on EGM licenses available to venues, presently set at 10 machines for hotels and 45 machines for clubs.

Informing the new limits are a set of related assumptions which combine to form a causal policy logic. This logic may be expressed in its simplest form as a causal sequence set out in Figure 4.1.

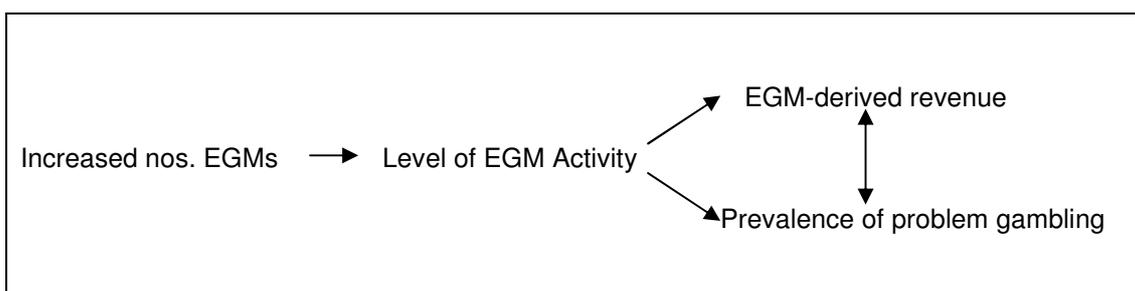


Figure 4.1. Hypothetical causal sequence informing NT EGM capping policy

In this causal sequence, any increase in the number of EGMs has two undesirable effects. The first is an increase in the revenue from EGM gaming. The second is an increased level of social harm through an increase in the prevalence of problem gambling. The mediating variable here is the level of EGM activity, which is hypothesized to rise because of increased number of EGMs in the community. These two undesirable outcomes are in turn interdependent, in that any increase in revenue (benefit) from EGM activity must be offset against the level social harm which it may have caused. The remainder of this section evaluates the universal capping policy by examining in detail the evidence for each of its constituent causal links (Figure 4.1). These links are based on the assumptions that:

- The number of machines in a jurisdiction is a guide to the level of exposure to EGM gambling opportunities (i.e. accessibility).
- Machine density is a reliable guide to the level of participation.
- The level of EGM activity directly determines the prevalence of problem gambling in a community (i.e. vulnerability).

4.2.1. Machine numbers and accessibility: There is a wide variation in the distribution of machines across community venues that renders the link between the number of machines and gambling opportunities extremely problematic. As Young and Tyler (2008) and Young et al. (2007) have demonstrated, the research literature puts a great deal more emphasis on the accessibility to gambling venues than on the number of machines within a given jurisdiction. Capping the total numbers, without taking into account the accessibility of the relationships between: (a) the distribution of machines (b) the distribution of gambling population in relation to this distribution and (c) the means of access of this population to the venues, may not produce its intended results. Transport corridors, proximity to shopping malls, and road access (distance and cost, difficulty, frequency) all play a part in defining accessibility. The type of venue, particularly under the current differential venue caps, has an impact as well. A heavily

used hotel location, for example, will not have the same impact on exposure as a remote club.

4.2.2. EGM concentration and expenditure. While the addition of a few machines may make little difference to the overall level of accessibility, the recent policy statement claims that capping the number of machines at their present level will have the effect of “removing about 1,000 potential machines from the community” (Burns, 2008). The suggestion here is that there is potential for the market to absorb a further 1,000 machines, with the implied risk of an increase in the prevalence of problem gambling. This link in the causal chain builds on the previous assumption that the total number of machines is a reliable indication of total exposure of the population to the opportunities to gamble, with little regard to the issue of accessibility.

The claim of the preventive effects of capping is, however, derived from three additional premises: (a) the level of EGM activity (and consequent revenue produced and social harm inflicted) within a community is directly related to the number of machines; (b) a potential demand for doubling EGM activity exists in the NT community, and (c) the proposed trading regime among machines would be unable to meet potential expansion of demand for EGM-style gambling. Common to each of these assumptions is a failure to take into account the relationships between expenditure, machine density (i.e. number per 1,000 adults) and concentration (i.e. the distribution of machines within localities and individual venues), and availability (a term used here to refer to venue characteristics such as location, opening hours, entry conditions and general regime of machine operation and control).

The research evidence in Australia, in explaining the link between EGM exposure and EGM expenditure, points to the central role of the density of gaming machines in a locality, as well as the concentration of machines in individual venues (Livingstone, 2001; Productivity Commission, 1999). These effects in local and venue-specific (rather than jurisdictional) terms are further underlined by the strong relationship found in the *NT Gambling Prevalence Survey Report* (Young et al., 2006, Figures 5.11 and 5.12) between the number of gambling machines per venue and the average player loss per machine. This is termed the “concentration effect” in the literature, a sign that the markets for EGM gambling may be supply-driven rather than demand-driven at the venue or local area level.

The “1,000 potential” extra machines in the NT must therefore be seen in the light of the capacity of the present market under the venue capping regime, coupled with the possibility for trading among the less profitable to the more profitable locations. Since this capacity has not been established, either by estimates of the ‘ceiling stress’ under the current venue caps or through the potential of trading scheme to alleviate this stress, the estimates of effects of the new universal cap and the possible number of machines that it “removes” from the market must remain hypothetical. The conclusion that can be drawn from the evidence on capping is that local areas and individual venues are the more powerful predictors of EGM activity than the gross number of machines supplied across a given jurisdiction. Along with venue location, accessibility, availability and the operational management, it appears that local and venue-specific factors provide important levers of a harm minimisation strategy than the limitation or reduction of the total numbers of machines in the jurisdiction.

4.2.3. EGM activity and problem gambling. The evidence for EGM gambling activity inevitably resulting in a higher prevalence of problem gambling in a community

seems quite unequivocal. The density of EGM machines per head of adult population in a local area, and their concentration within venues, do contribute to levels of problem gambling, mediated of course by the other factors such as accessibility, availability, and the operation of venues (Young et al., 2006; Eltridge and Delfabbro, 2006). Indeed, the factors of proximity, accessibility and availability interact to produce an association between local machine densities and rates of problem gambling (Productivity Commission, 1999, Chapter 8), a finding which is also well established in international literature (National Gambling Impact Studies Commission 1999; National Opinion Research Centre, 1999).

However, even this evidence must be heavily qualified by the mediating effect of social and economic status of localities. Specifically the vulnerability of the population of the local areas contributes to this link. Marshall and Baker (2001a; 2001b) identify a number of factors in the research literature that contribute to the spatial correlation between low socio-economic status of a local area and high EGM availability including 'blue collar' area responsiveness to supply, fortuitous historical locations of EGM venues (i.e. around licensed premises in the inner suburbs), government caps and ownership policies, as well as the issues of accessibility outlined above.

Even the finding of a decisive effect of social vulnerability as a major source of mediation between EGM exposure and levels of problem gambling may require further qualification light of the research in the present decade in the Canberra suburb of Tuggeranong by Doran et al. (2007) and in Victoria by McMillen and Doran (2006). In the Victorian case the use of indices of socio-economic disadvantage at the level of LGAs to develop a caps policy of harm minimisation of EGMs "may be flawed" (McMillen & Doran, 2006, p.24) in that their analysis indicated "no direct or uniform relationship between EGM expenditure patterns, SEIFA measures of disadvantage and density of gaming machines" (p. 21). This finding corroborated results of the analysis of the South Australia Centre for Economic Studies (2005) study of Victorian capping policy. The Tuggeranong (ACT) study demonstrated that the effect of proximity on gambling activity needed to be qualified by the spatial profiles of venue catchments, typified by the average distance travelled by patrons. This study showed that the effects of harm reduction strategies based on capping policies must take into account not only the great variability of activity across venues, but also of the behaviours of the consumers who frequent them.

In the NT context, the results from the 2005 *Prevalence Survey* (Young et al., 2006) indicated a general alignment with the findings from other jurisdictions, but with some important differences. A higher prevalence of problem gambling was evident in the regions with higher levels of machine concentration and EGM expenditure (i.e. Darwin and Alice Springs) together with higher levels of expenditure on EGMs for problem gamblers than for non-problem gamblers. However, there was a positive, rather than a negative, relationship between machine densities and levels of economic resources at the statistical divisional (SD) level and for player loss per machine for both clubs and hotel at the statistical local area (SLA) level. As has been reported in Chapter 3 of the present report, the most significant "hotspot" among the regions (i.e. Palmerston) for levels of expenditure also rates second highest among the ten NT statistical divisions with community venues in the Index of Economic Resources (Fig 5.10).

If the links between EGM exposure, expenditure levels and problem gambling prevalence should prove to be so elusive at the local level in the NT, there is every chance that a universal capping policy, (i.e. at a jurisdiction rather than at a regional

or local area level), may be ineffectual as a policy of harm minimisation. Not only have the more finely-tuned capping policies proven to be a blunt instrument in the regional studies of the Victorian experience, but a jurisdictional cap which does not take into account the socio-spatial, economic and cultural factors of the relationships between numbers of machines and prevalence levels of problem gambling, and which at the same time allows for inter-venue trading, seems to be an inadequate response to the social and personal impacts of community-based EGM gambling. Given these complexities, the casual sequence in Figure 4.1 is evidently limited.

4.2.4. *The role of EGM venues in social outcomes.* An alternative model of the relationships between venues and social outcomes is presented in Figure 4.2. In the complex relationships between structures, processes and social impacts, venue characteristics are given a central structural, mediating position. Within this model, the recently announced NT Government EGM capping policy might now be seen as a regulatory device for mediating the relationship between the structures of supply and demand and social and economic outcomes as these are filtered through the socio-spatial processes of accessibility, availability and consumer behaviour. In this process, venue characteristics have a prior structural position in linking patterns of ownership and control and social and economic processes that, along with regulatory mechanisms, influence the distribution of the benefits and costs of EGM gambling within the wider community.

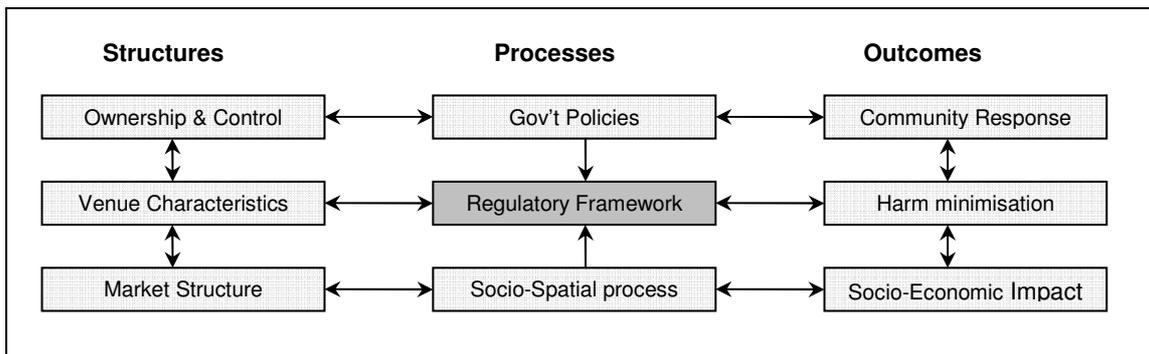


Figure 4.2. The causal process of harm minimisation¹

4.3. Development of a venues typology

How then can such a complex model of the place of venues in the causal process help to develop a licensing policy that goes beyond the proposed universal caps on numbers of EGM machines? Since the available resources of the present project do not allow a full exploration of the links between all of the boxes in Figure 4.2, we focus on the more important of these for limiting social harm. We have extracted three main venue-specific and local factors:

- a) the level of venue gambling activity (i.e. no. of machines and annual revenue)

¹ This model appeared first in Young, Tyler and Lee (2007), *Destination-Style Gambling”: A Review of the Literature Concerning the Reduction of Problem Gambling and Related Social Harm Through the Consolidation of Gambling Supply Structures*. Darwin: School for Social and Policy Research, Charles Darwin University.

- b) socio-economic advantage/disadvantage of venue catchments
- c) machine density of locality (i.e. number of machines per 1,000 adults)

By applying a factorial approach it will be possible to develop an empirically-derived typology of venue from the key predictor or contextual variables of gambling activity. These underlying variables or dimensions will be used to predict the main economic outcomes, such as the revenue raised or the profitability of individual venues. Separate analyses will be conducted for hotels and clubs. The aim of this analysis will be to produce a classification of venues for policy purposes.

4.3.1. Principal components analysis (PCA). A typology will be derived from the application of principal components analysis of a number of key venue variables for the latest year of observation (2006-07) for both hotels and clubs. This analysis will identify the underlying dimensions (or factors) with which the venues are associated. When all observed variables each load on one component and not on others, the pattern of loadings is known as “simple structure”. Such an outcome from the analysis of “simple structure” would present a desirable outcome for the development of empirically-based typology, since it would provide a strong evidential basis for a two (or more) dimension space in which individual cases can be positioned and compared. Not only would such an outcome reduce the complexity of the observed data which may hold many variables, it would also provide, through the calculation of factor scores for each variable, a basis for a graphic representation of the distribution of cases in a multi-dimensional space. If venues, for instance, could be positioned in such a space as either low or high on either, or both dimensions, we would have the basis of a four-cell typology that may be an alternative to the “one size fits all” approach to the development of licensing policy.

4.3.2. Data sources. The data used here was supplied by the NT Department of Justice for the years 1996-97 to 2006-07. These provided monthly revenue and machine numbers for 84 community-based venues that traded over that period (i.e. 44 hotels, 40 clubs). In the latest year, 2006-07, on which the core analytical section is based, 73 of these were trading (i.e. 40 hotels, 33 clubs). However, this number was reduced to the 66 cases (i.e. 34 hotels and 32 clubs) for which a full set of data were available². Monthly revenues were aggregated and deflated to their 1996 values, as for the GIS series in Chapter 3. The contextual (i.e. demographic/socio-economic) variables were drawn from the latest available ABS SEIFA based on data gathered from households at the 2001 Census (ABS, 2003), together with the population estimates used for their calculation. Both indices and population data were aggregated at the SLA (e.g. suburb or township) for those areas hosting community venues. These areas were also assigned values for their postcodes, administrative regions and statistical subdivisions (SSDs). Two SEIFA indices of the level of advantage for the local areas of venues were used, the *Index of Advantage/ Disadvantage* and the *Index of Economic Resources*, the latter having been found to have the highest convergence of all four indexes between factor scores for the NT and those for the whole of Australia on data from the 1991 Census (Tyler and Morrison, 1996). The measures included in these two composite indices (where higher scores indicates higher levels of social or economic advantage) include a host of indicators covering employment and

² Excluded venues were: Humpty Doo and Rural Area Club, Fox ‘n Fiddle British Inn, Mataranka Hotel, Squires Tavern, The Deck Bar, Threeways Roadhouse and Virginia Tavern.

unemployment, living conditions, family structures, income levels, rental and mortgage commitments, use of internet and education levels.

4.3.3. Variables and their distributions. The EGM-related variables of interest included here are the deflated revenues for the latest year 2006-07 and the number of licensed machines per venue. There are two kinds of contextual factors that arose from the review of harm minimisation policies: (a) those concerned with exposure to gambling opportunities on a local area, such as the numbers of venues (an index of density) and of the ratios of venues and EGM machines to population in a locality (an indexes of dispersion) and (b) the level of socio-economic advantage/disadvantage of the local population. For the first factor, these indices of density (using log transformed values of population and machine numbers), the SLA values (n=35) were used. For the second factor, the two SEIFA indices, advantage/disadvantage and economic resources were used, together with 2001 census counts on which these were based.

4.3.4. Developing a typological strategy. Hotels and clubs. A principal components analysis (with varimax rotation) will be applied to the data for community-based venues in each sector. This will extract from the data the underlying dimensions in the local area indicators. As outlined above, these indicators are:

- the ABS/SEIFA indexes of *advantage/ disadvantage* and *economic resources* for the SLA in which the venue is located
- the number of venues in the SLA (i.e. density)
- two ratio variables for dispersion including the 2001 Census population count divided by the number of EGM machines and the 2001 Census population count divided by the number of venues³.

The issues to be explored (and the methods employed to address them) are as follows:

- a) The success of the extracted components in reducing the complexity in the five indicators, while at the same time explaining most the variance in their scores, will be tested by the number of components or factors generated that have “Eigen values” greater than 1 and by the value of percentage of “variance explained” in the observed scores for venues by these components.
- b) Whether the pattern of association between indicators and components yield what is known as “simple structure” will be judged by the separation of the loadings across the components extracted.
- c) Whether the pattern of loadings for hotels differ significantly from that for clubs will be examined by a cross tabulation of the results of the analysis for both sectors to show convergence or divergence in the underlying patterns of association between the five indicators and the components extracted from their scores.
- d) The use of component scores for venues to develop typologies of hotels and clubs for the NT will be achieved by the creation of factor scores. These are composites of the independent contribution each indicator makes to its underlying (or latent) factor. This contribution is represented by its factor

³ The number of machines and the population figures were log-transformed to avoid the extreme positive-skewness in the original distributions.

score coefficient. Venues scores can then be graphed on a scatterplot where the extracted components are the axes. The distribution of scores in this dimensional space will then provide the empirical basis for the development of a typology.

4.3.5. *Results of principal components analysis.* The results of the PCA for both hotels and clubs are shown in Table 4.1. This includes both the component loadings and coefficients for each of the contextual indicators of the 66 venues in the final sample for the year 2006-07.

Table 4.1. Factor loadings and score coefficients of venue contextual indicators

Indicator	Hotels 2006-07				Clubs 2006-07			
	Loadings		Coefficients		Loadings		Coefficients	
	1	2	1	2	1	2	1	2
Factor No.								
SLA Index of Advantage-Disadvantage	-0.16	0.97	0.11	0.53	0.13	0.98	-0.08	0.53
SLA Index of Economic Resources	-0.21	0.97	0.09	0.52	0.16	0.97	-0.07	0.52
SLA population 2001/ No of EGMs*	0.83	-0.30	0.32	-0.02	0.78	0.15	0.33	-0.03
Number of venues in SLA 2006-07	-0.93	0.15	-0.39	-0.09	-0.94	-0.15	-0.41	0.05
SLA population 2001/ No of Venues	0.98	-0.10	0.42	0.13	0.93	0.09	0.41	-0.08
% Variance explained in observed values	51.6%	40%			47.7%	39%		

Principal Components Analysis with Varimax Rotation; N=34 for Hotels, N=32 for Clubs

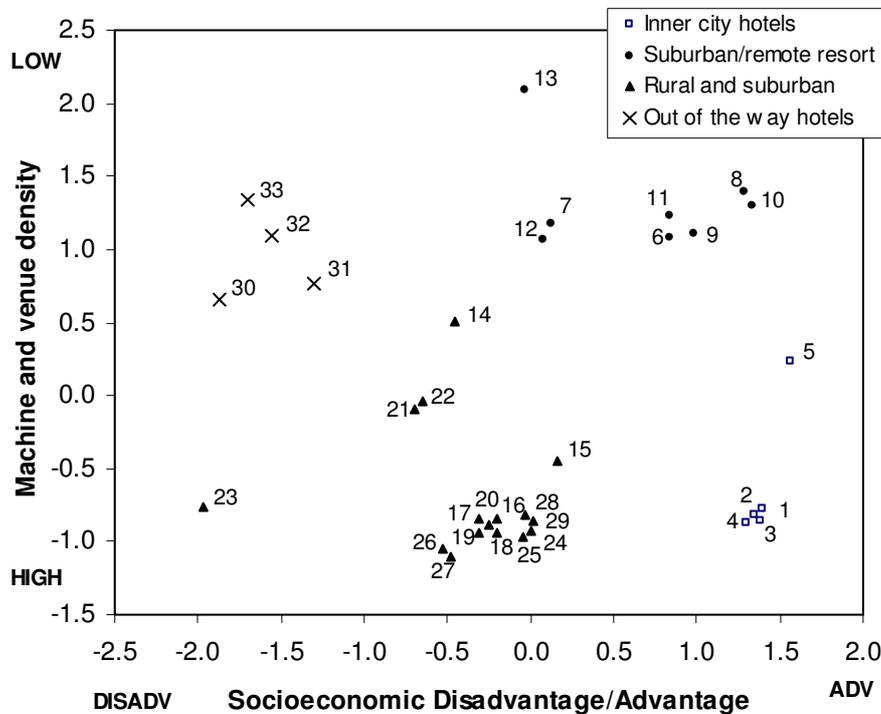
* log (base 10) transforms were used for both EGM numbers and population counts

All four issues raised above may be addressed from the results shown in this table. There appear to be two factors with Eigen values > 1 for both hotels and clubs which explain roughly the same (very high) percentage of variance in the original indicator scores. The pattern of loadings and of coefficients suggest a simple structure of differentiation between a first factor with very high loadings for dispersion/density measures explaining about half the variance, and a second, less powerful factor with high loadings for the two measures of socio-economic advantage/disadvantage. The coefficients follow similar patterns, with one of the main density indicators losing its predictive power when the other two indicators (i.e. number of venues and population/venues) are held constant. Therefore, the extraction the two uncorrelated component loadings provides a firm basis for building a typology of each of the venue types. While the loadings and coefficients are almost identical for each sector, as might be expected since hotels and clubs in most cases share the same local contexts, for present analytical and comparative purposes, a separate typology will be developed for each venue type.

The factor or component scores for venues generated by the analytical procedure can now be used to create a scatterplot in a two dimensional graph for each sector, with the dimension representing socio-economic advantage along the horizontal axis and the dispersion/density factor along the vertical axis (Figures 4.3 and 4.4). The strength of this approach for typological purposes is that it allows a venue to be high or low on one dimension independent of its value on the other, which creates the basis for identification of clusters in this statistically-constructed space.

4.3.6. *Typology of hotels.* The scatterplot of hotels licensed for EGMs (Figure 4.3) illustrates the diversity within their distribution across the two dimensions of socio-economic advantage and machine and venue density. In order to group these hotels

into a limited number of clusters which might become the basis of a typology, a hierarchical cluster analysis (using SPSS Classify) was applied to the component scores. This method is based on a matrix of the squared (Euclidean) distance between component scores among all venues. This method produced four clusters with at least two venues. The clusters identified in Figure 4.3 may be interpreted in terms which resonate very closely with the GIS analysis discussed in the previous Chapter.



Inner city hotels	Suburban/remote resorts	Rural & suburban	“Out of the way” hotels
1. Kitty O'Sheas	6. Airport Hotel	14. Winnellie Hotel	30. Mandorah Hotel
2. The Cavenagh	7. Plaza Karama Tavern	15. Palmerston Tavern	31. Pine Creek Hotel
3. Top End Hotel	8. Hibiscus Tavern	16. Howard Springs Tavern	32. Timber Creek Inn
4. Victoria Hotel	9. Parap Tavern	17. Humpty Doo Hotel	33. Aileron Roadhouse
5. Quality Hotel Frontier	10. Beachfront Hotel	18. Humpty Doo Tavern	
	11. Hidden Valley Tavern	19. Litchfield Tavern	
	12. Heavitree Gap Tavern	20. Noonamah Tavern	
	13. Uluru Resort Resident's Club	21. Adelaide River Inn	
		22. Rum Jungle Inn	
		23. Walkabout Tavern	
		24. Crossways Hotel	
		25. Katherine Hotel	
		26. Goldfields Hotel	
		27. Tennant Creek Hotel	
		28. Gapview Resort Hotel	
		29. Todd Tavern	

Figure 4.3. NT hotels clusters 2006-07: Scattergram of principal component scores (grouped by proximities)

These four clusters may be typified in socio-spatial terms as:

1. *Inner city precinct hotels* (lower right cluster). These hotels are located either in, or on the fringes, of the Darwin Central Business District and are very close to the

precinct centred on the Mitchell Street tourist/ recreation strip. On the one hand these hotels are located in a socially-advantaged local catchment of the burgeoning apartment blocks of the inner city and Cullen Bay. On the other hand, the combination of their high numbers and densities creates a competitive environment that appears to rely on a transient, non-local clientele.

2. *Suburban/ remote resort hotels* (upper right cluster). All of hotels, with the obvious exception of the Ayer's Rock Resort, are located in the suburbs of Darwin and Alice Springs. The suburban hotels are located in middle to high socio-economic environments characterised by lower local levels of machine and venue densities. This pattern therefore contrasts with that of the inner city precinct. Suburban hotels also tend to draw on a local, relatively affluent, family-centred clientele, who are in Darwin's case, relatively isolated geographically from the venues of the inner city. The inclusion of the Ayer's Rock Resort venue is more difficult to explain, except perhaps in that its isolation and lower socio-economic context locates it in this, rather than in the previous, cluster.

3. *Rural and minor urban hotels* (bottom cluster). With the exception of the two outliers to this cluster – The Winnellie Hotel which adjoins an Industrial area, and the Palmerston Tavern centred in a the Darwin's main satellite city – the hotels in this group are located in rural or minor urban areas with higher than average densities and medium levels of socio-economic advantage. These hotels would draw from various mixtures of both local and tourist clienteles, often characterized by a strong masculinised "front bar" subculture, though several hotels have recently developed a more upmarket family restaurant trade (particularly in the Darwin surrounds). The image fostered by this cluster can be most closely associated with a "frontier" culture of traditional gambling and outdoor activities (the Walkabout Tavern derives its name from the Crocodile Dundee movies and the Noonamah Hotel nationally famous for its Melbourne Cup Day frog-racing event).

4. *"Out of the way" hotels* (far left cluster). This small cluster is socio-spatially quite heterogeneous, though its member hotels tend to be located in small off highway townships or roadway service hamlets. Their catchments (high levels of dispersion, low density) are difficult to define, and are probably quite seasonally variable and also heterogeneous. These areas, however are characterized by low socio-economic advantage (or high socio-economic disadvantage), influenced by their low population densities with often a high representation of Indigenous communities.

This attempt to classify the hotels of the NT is exploratory and tentative. The socio-spatial and demographic instabilities of the region - its high levels population transience and geographical dispersion, seasonal variability, multi-racial composition and juxtaposition of highly suburbanized and remote patterns of settlement – render such an attempt rather problematic. However, there appear to be clear divisions in the tendencies of each of the clusters identified so far that might help to define the markets for EGM hotel gambling that could inform a licensing policy.

The analysis has identified, at least for the urban areas, some market dynamics that define the tensions between the inner city and the suburban hotels – between the former that operate in a competitive, high density multi-venue context with a high reliance on transient, after-work and non-resident patronage and those that operate in a far less competitive environment with lower machine densities and a largely

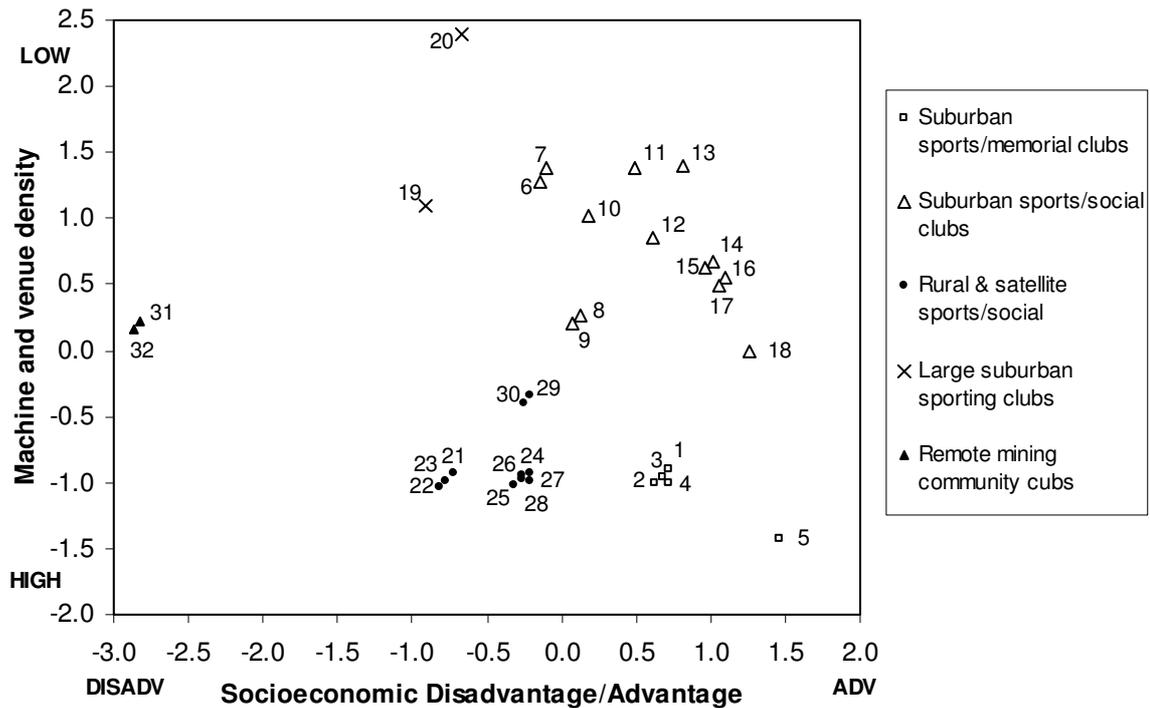
Darwin-resident clientele. In the GIS analysis, this would resonate with the conditions for contexts labelled as either “inner-city agglomerations” on the one hand, or “suburban gambling complexes” on the other.

For the rural and remote clusters, the picture is more complicated. Here the line of differentiation is defined in socio-economic rather than market structure terms, along a dimension which ranges from the relatively affluent Palmerston Tavern in the SLA of Driver through to relatively isolated townships and roadside service hamlets. These tensions and polarities, broad and intersecting as they are, do provide at least a workable basis for informing a context-sensitive licensing policy.

4.3.7. Typology of clubs. The scatterplot and cluster display for clubs licensed for EGMs (Figure 4.4) is constructed using the same methodology as that for hotels, across the same two localised dimensions of socio-economic advantage and machine and venue density. A clustering by proximities on this scatterplot produced five clusters inclusive of at least two venues.

Owing to the more specialized charters and localized membership and patronage of clubs, the proximities produce a less market-driven, more functional pattern of clustering than that for hotels. Here the socio-spatial patterns are therefore more diffuse and the probability of overlaps and anomalies are greater. However, there is a fairly clear differentiation on at least two axes that tend to simplify the groups on the basis of these empirically-derived types or clusters: (i) the urban – remote axis, which runs horizontally from the Darwin Inner City clubs to the East Arnhem land pair, with the small urban and satellite-town clubs of Palmerston, Katherine and Tennant Creek intervening; (ii) a specialized sporting/ social and recreational club axis which runs vertically, creating the cleavage between the inner city clubs and the suburban clubs with large, non-playing memberships and family patronage, such as the Casuarina All Sport Club (formerly Casuarina Tavern) and the Trailer and Sailing Boat Clubs, situated between the CBD and the Northern suburbs of Darwin. While these five clusters are more difficult to typologise or label than were those for hotels, they may be classified as follows:

1. Specialised inner city sport and memorial clubs (lower left)
2. Suburban social and recreational clubs (middle right)
3. Rural town and satellite social and recreational clubs (bottom of graph)
4. Peripheral city clubs (upper left) (i.e. on fringe of populated areas)
5. Remote mining community clubs (far left)



Suburban sports/memorial clubs	Suburban sports/social clubs	Rural & satellite sports/social	Larger suburban sporting clubs
1. Darwin Golf	6. Jabiru Sports & Social	21. Sporties	19. Tracy Village sports
2. Darwin North RSL	7. Gillen Club	22. Tennant Creek Bowling	20. Darwin Rugby League
3. PINT Club	8. Alyangula Golf	23. Tennant Creek Memorial	
4. St Mary's Football	9. Alyangula Recreation	24. Katherine Club	
5. Darwin RSL	10. Palmerston Sports	25. Katherine Country	
	11. Nightcliff Sports	26. Katherine Sports / Recreat.	Remote mining clubs
	12. Casuarina All Sports	27. Alice Springs Memorial	31. Gove Country Golf
	13. Buff Club	28. Alice Springs RSL	32. The Arnhem Club
	14. Alice Springs Golf	29. Cazalys Palmerston	
	15. Federal Sports	30. Palmerston Golf club	
	16. Darwin Bowls / Social		
	17. Darwin Trailer Boat		
	18. The Darwin Sailing		

Figure 4.4. NT club clusters 2006-07: Scattergram of principal component scores (grouped by proximities)

These categories are far from water-tight, since there is a strong sporting basis to many of the suburban and rural social clubs. They are merely indicative of a typical functional orientation rather than of homogenous categories. The catchment areas of the clubs is no doubt much wider than that for most of the hotel clusters, given the small size of the urban centres of the NT (including Darwin and environs), the high levels of accessibility, and the wide networks of association through sport, friendship and work contacts that they draw upon for both membership and visitor patronage. Nevertheless, even the methodology behind this rough classification does have an empirical basis in the literature on venue contexts and has at least found some resonance in a socio-spatial distribution. Much more work is needed in order to fill out the actual degree of fit between these clusters and the socio-economic profiles of the clientele they serve. As with the hotels, however, the divisions between inner city, suburban and rural towns re-appear and are broadly consistent with the GIS typologies of the previous Chapter.

4.3.8. *Predicting performance.* The question now remains as to whether the component scores and the identified clusters predict the actual EGM revenue of venues (as suggested by the logic behind the causal chain of Figure 4.1. where EGM exposure produces higher levels of EGM activity and government revenue). If these trends are combined with populations of socio-economic vulnerability, the tendency will be an increase in the prevalence of problem gambling across a jurisdiction. Just as we have tried, guided by the research literature, to break this chain down spatially into its localized version, it is now time to test the mid-section of this causal chain in which the indicators of gambling activity will be regressed on the contextual variables.

These outcome indicators of performance are: (i) revenue or profit in year 2006-07 in each hotel and (ii) club and hotel ratios of this revenue to the number of licensed machines (\log_{10} transforms for all original scores will be used in order to normalize their distributions). The predictor variables are component dimensions scores (i.e. socio-economic advantage/disadvantage and machine and venue dispersion/ density). The results of the analysis (i.e. SPSS univariate analysis of variance) for both venue types are shown in Tables 4.2 and 4.3.

Table 4.2. Hotel and club revenues* 2006-07 predicted by two contextual factors[#]

	Parameter	B	SE	t	Sig.	Effect Size
Hotels	Intercept	5.40	0.11	48.71	0.00	0.99
	Machine and Venue Dispersion	-0.18	0.11	-1.60	0.12	0.08
	Socio-economic Advantage	0.42	0.11	3.70	0.00	0.31
Clubs	Intercept	5.54	0.15	36.83	0.00	0.98
	Machine and Venue Dispersion	-0.07	0.15	-0.45	0.65	0.01
	Socio-economic Advantage	-0.16	0.15	-1.07	0.29	0.04

*Log (10) transforms of revenue and EGM numbers); [#]Univariate ANOVA

Table 4.3 Prediction of average EGM revenue* by two contextual factors[#]
NT hotels and clubs 2006-07

	Parameter	B	SE	t	Sig.	Effect Size
Hotels	Intercept	5.91	0.16	36.44	0.00	0.98
	Machine and Venue Dispersion	0.39	0.17	2.39	0.02	0.16
	Socio-economic Advantage	0.01	0.17	0.07	0.94	0.00
Clubs	Intercept	4.74	0.15	30.96	0.00	0.97
	Machine and Venue Dispersion	0.08	0.16	0.54	0.60	0.01
	Socio-economic Advantage	0.20	0.16	1.31	0.20	0.06

*Log (10) transforms of revenue and EGM numbers); [#]Univariate ANOVA

The results from the two analyses of variance of levels of venue activity suggest that hotels, rather than clubs, are influenced by contextual factors. Revenue of hotels shows a relatively high dependence on the socio-economic advantage level of the local area, while their average machine profitability is positively influenced by the local dispersion or density factor. Club performance, on the other hand, shows no clear statistically significant influence by either contextual factor. For hotels, the influences go diametrically against those found for metropolitan contexts. In the NT,

it is higher local affluence and lower concentrations of machines and venues that appear to be the associated with higher levels of EGM activity, rather than vulnerability and higher densities. Although the GIS mapping includes clubs, this finding is corroborated by the “mountains” of activity of the previous Chapter (esp. Figures 3.6 through 3.10) for Darwin and Alice Springs. These identify relatively affluent areas that have easily identifiable “hotspots” associated with wide suburban catchments.

The conclusion that may be drawn from this section is that, while there are empirically verifiable contextual clusters for both hotels and clubs in the NT, these are not so easily matched to the levels of EGM activity, whether it be by volume of revenue or machine performance. Where it is possible to find a contextual dimension, the direction of effect does not support the “exposure plus vulnerability” formula that has driven the harm minimisation policies expressed in the capping strategies of southern jurisdictions. If the contrary is the case in the NT, as it appears to be for hotels at least, then it would seem appropriate to explore the effects of the venue capping regulations that are now in place on EGM activity.

4.4. Implications for harm minimisation

In this section we will explore the differences between capped and non-capped venues, from an activity and market-oriented, rather than from a catchment-focussed, perspective. Two salient questions will be answered:

- a) Is EGM activity affected by the existing caps on venues (i.e. 10 for hotels, 45 for clubs), as a supply-side assumption might suggest, or is it driven by demand?
- b) If capping does have an effect on activity (whether positive or negative), then what might be the consequence of lifting the existing caps?

The answers to these questions might help to test the last link in the chain of causality set out in Figure 4.1, for if the activity is not a function of capping strategies, then one might need to examine the assumption that capping, whether at the jurisdictional, regional or venue level, will make an appreciable contribution to reduction of the prevalence of problem gambling.

4.4.1 Comparison of EGM activity levels (capped and uncapped venues). Capping at the venue level affects each community venue type differently. While 28 (82%) out of the hotel sample are capped at the maximum of 10 machines, only 8 (25%) of the club venues are at their maximum of 45. This disparity obviously represents evidence for significant difference in the supply elasticity between the two sectors. Government-set ceilings or caps therefore affect the markets for EGM gambling differently in the two community sectors.

However, in any market (or section of a market) where the supply is capped, irrespective of levels of “price” or player loss that consumers are willing to pay, we usually have an instance of perfect inelasticity of supply. If capping does produce excessive demand pressure, consumers may adjust their level of demand, ration the good or service (by time-sharing or by queuing) or substitute it with some other product (whether legal or illegal). These processes often take place over a long period, which is why economic modelling differentiates between the short term and long term elasticities of supply (Samuelson et al., 1975, Fig 19.5). Therefore it will be useful to

explore consumer reaction in each sector. Any difference in activity between capped and non-capped venues is best compared on the basis of the average of their machine revenues for both community sectors (Figure 4.5).

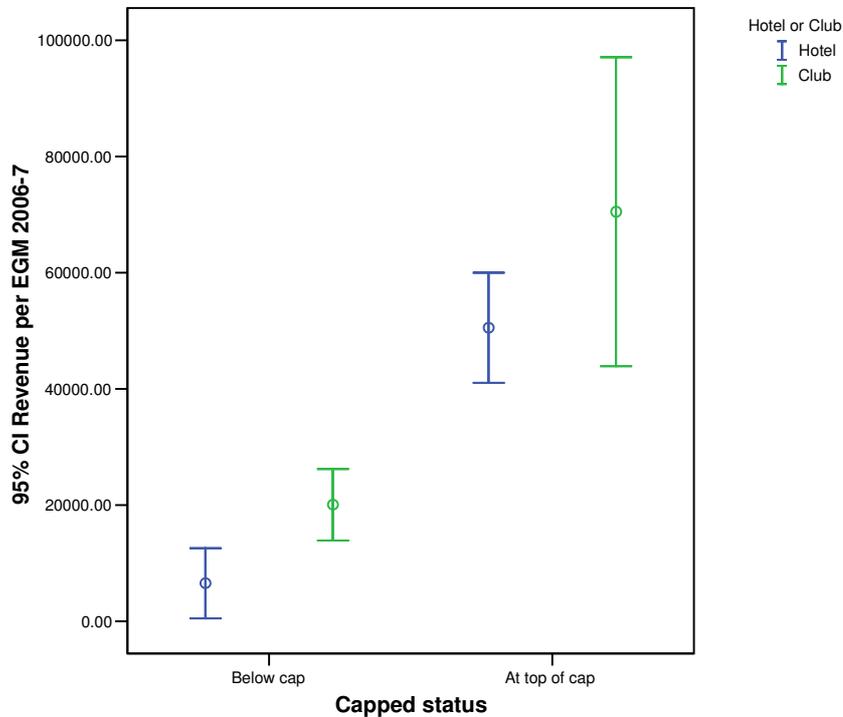


Fig. 4.5. Error bar comparison of average revenue per EGM, NT hotels and clubs 2006-07

Figure 4.5 shows a comparison of the confidence intervals (95% level) of the means of average EGM revenue during the financial year 2006-07. It is clear from this graph that there is a very large gap in machine performance between hotels and clubs that have, or have yet to reach, the top of their allowed numbers under the cap. The gaps are statistically significant also between clubs and hotels in the uncapped venues, with the hotel bar failing to overlap with that of the clubs. Clearly there is good evidence here of a link between capped status and increased machine activity for both types of venues, with the capped sample showing four or five times the level of average revenue per machine. While this may provide a basis for trading machines from lower-yielding clubs to higher-yielding ones, it does not suggest that the overall levels of exposure to “at risk” populations will be reduced. Rather, freezing supply may well have the effect of increasing the overall levels of exposure. Whether this exposure would be greater in the case of vulnerable populations than of others would depend on the nature of catchments and patronage – data which is not available at present.

4.4.2 Elasticity and machine supply for clubs. A more detailed analysis for clubs (Figure 4.6) which shows the relationship between machine numbers and revenue for clubs in 2006-07 indicates strong evidence of a high existing inelasticity of supply for clubs (hotels are an even more extreme case). This inference is based on the vertical crowding at the top of the cap (25% of the sample). These cases represent instances of perfect inelasticity which is the limiting case for both elasticity and regression lines

(Samuelson et al, 1975, p. 436). All of the curves show a very high level of “fit” to the relationship between machine numbers and average machine activity – ranging from 73% of variance explained by growth model to 85% for the cubic transformation).

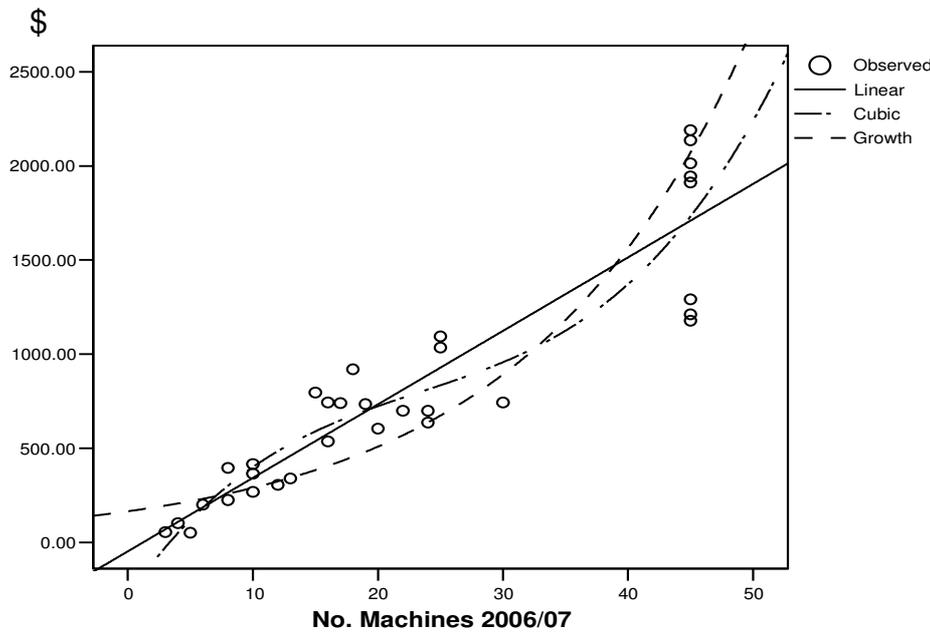


Figure 4.6. Curve-fit of EGM numbers to EGM activity⁴, NT clubs 2006-07

We may conclude from these two figures that, under a universal EGM freeze combined with a trading regime, we may see a larger proportion of clubs cluster at the top of the cap over time, while hotels cluster more heavily at the top of their capping limit. If these caps result in increased average machine play, time-rationing and queuing for a limited number of machines, particularly in the larger and more profitable urban venues, may result. EGM shortage in peak periods may tip the structure of EGM demand in favour of the more “time-rich / money-poor” groups such as pensioners, unemployed, part-time employees and welfare recipients. Although these groups are already able to restructure their gambling behaviours to off-peak periods, venues would be under increased competitive pressure to stimulate demand towards this section of the market. The pressures towards such a diversification of demand under conditions of inelasticity of supply would be intensified by population growth and urbanization (particularly in the Greater Darwin area) and by the projected doubling of the over-65 yrs age group in the coming decade (Productivity Commission, 2004).

4.4.3. A vicious cycle? Machine migration and social impact. Since the direction of the relationship between a capped supply and machine activity points ominously towards a situation of near-perfect inelasticity, one may envisage an alternative,

⁴ The square root of the club revenue is taken as the dependent variable to produce the same effect as a ratio of machine numbers to machine/ revenue ratio (i.e, an index of machine activity).

rather pessimistic, view of the social effects of the proposed cap-and-trade strategy than that presented in Figure 4.1 This prediction would see an imposition of both jurisdictional and venue caps running along the following lines: (a) a migration of EGMs from less profitable to more profitable venues with higher proportions of clubs approaching the cap; (b) an increasing level of EGM play and of overall government revenue; (c) development of new markets in off-peak periods; (d) a disproportionate uptake of off-peak availability by “time rich/money-poor” patrons (i.e. unemployed, pensioners, outer suburban and welfare-dependent groups); (e) increased levels of problem gambling in these vulnerable populations. An attractive, but ill-advised, regulator response to such an outcome might be further extension of blanket capping policies. However, a continuous monitoring regime, informed by detailed knowledge EGM accessibility, client profiles and the dynamics of licence trading would at least provide some prospect of preventing such an unintended outcome.

The error bars of Figure 4.5 and the curve-fits of Figure 4.6 suggest that empirical evidence from NT data for a causal link between capping (jurisdictional or venue) and levels of EGM activity is, at this stage, not compelling. Nor would the clustering of venues from the typological analysis support a regional capping policy would be any more effective in reducing exposure levels of EGM gambling opportunities to vulnerable populations. Apart from the evidence that such a policy has not worked as intended in metropolitan areas, the NT patterns suggest a reverse effect of local effects from measures of machine density and socio-economic advantage. If, as indicated by the cluster analysis, that venues and machines tend in the NT to be concentrated in localities of middle to high socio-economic advantage, then a system of regional caps based on indicators of local disadvantage will fail to target areas of highest socio-economic vulnerability.

4.4.4. Community Impact Analysis Guidelines. One immediate regulatory consideration of the results above analysis might be a planned revision of some of the *Community Impact Analysis Guidelines* to the fulfilment of *Section 2(k)* of the *Gaming Machine Application* to the Licensing Commissioner. While much of the venue and locality information requested is extremely relevant to any licensing decision, it would appear that a good deal of the details on the nature of the immediate neighbourhood (i.e. density of population, proximity to other venues and density of gaming machines) is influenced by policies based on metropolitan areas, where the proximity and exposure effects appeared to be major concerns reported by the Productivity Commission (1999). As we have seen, these factors in harm minimisation do not loom nearly as large for NT venues, where the main determinants of machine activity are defined more along urban/ rural lines and where higher densities both of machines and venues are characteristic of middle or higher income areas.

More salient than these factors, perhaps, would appear to be the actual (rather than targeted) patrons, an estimate of the total catchment area of the venue (and not just of its immediate neighbourhood), patterns of gambler or patron behaviour (daily and weekly peak hours, with some indicator of congestion factors), and cycles of activity relating to the Commonwealth Government welfare payments. This information will be particularly relevant to the granting of additional licences, or for the re-location of existing ones. This task would, of course, require more discussion and consultation, based on the findings of this and other sections.

4.5. Implications for research

These findings corroborate not only those of the *2005 NT Prevalence Report* (Young et al., 2006) but also the conclusions and recommendations of the recent NT Harm Minimisation Discussion Paper (Fogarty & Young, 2008). The results of the present analyses, however, elaborate and fine-tune their implications for developing a research program that builds on the findings of this investigation. This program necessarily follows a range of methodologies which would attempt to fill in the gaps in policy-relevant knowledge of the unique conditions of the NT. These would include:

1. *A series of cases studies* of one typical venue from each of the clusters of hotels and clubs identified in Figures 4.3 and 4.4 above. Each study would profile the club by its ownership, community functions, clientele, location, operational procedure. Access to the Commission's data base of community impact analyses and other EGM application-relevant material would be a valuable resource for these studies.
2. *A telephone survey* of the suburban regions of both Alice Springs and Darwin, similar to that used in the Tuggeranong Study in order to identify the catchments of clubs and hotels, by distance travelled to each (Marshall et al., 2004).
3. *A series of exit surveys and observational studies* of each type of venue, again possibly using the clusters of Figure 4.3 and 4.4, in order to identify the consumer profiles (socio-economic and/or geo-coded) over a typical two-week period. Access to patrons for either of these would need to be negotiated with the venue management.
4. *A micro-economic analysis* of patterns of demand and supply for EGMs across each of the venue clusters. These would examine both short-term and long-term trends in the place of community EGMs in the gambling industry (*vis a vis* interactive gambling), with implications for venue income and sustainability.
5. *An incidence (as against a prevalence) study* of problem gambling using health and addiction data from relevant agencies and support groups.
6. *A policy review* of existing venue EGM licensing arrangements (including capping policies), drawing on surveys and interviews with providers, operators and regulators, problem gambler agencies, matching these where possible with evidence from player loss and other micro-economic data.

References

- Alder, O. (1998). *Northern Territory Gaming Machine Industry*. Darwin.
- Australian Bureau of Statistics. (2003). *Socio-economic Indexes for Areas, Australia 2001 (SEIFA2001)*. Publication no. 2039. Canberra: ABS.
- Australian Bureau of Statistics. (2007a). *Population Distribution, Aboriginal and Torres Strait Islander Australians, 2006*. Canberra: ABS.
- Australian Bureau of Statistics. (2007b). *Regional Statistics, Northern Territory, 2007*. Canberra: ABS.
- Australian Bureau of Statistics. (2008a). *Consumer Price Index, Australia, Dec 2007*. Canberra.
- Australian Bureau of Statistics. (2008b). *Darwin and Palmerston: A Social Atlas*. Canberra: Australian Bureau of Statistics.
- Australian Bureau of Statistics. (2008c). *Retail Trade, Australia, Jan 2008*. Canberra.
- Australian Bureau of Statistics. (2008d). *Tourist Accommodation, Australia, Dec 2007*. Canberra: ABS.
- Baker, R., & Marshall, D. (2005). Modelling gambling time and economic assignments to weekly trip behaviour to gambling venues. *Journal of Geographical Systems*, 7(3/4), 381-402.
- Burns, C. (2008). *Hospitality and Gaming Reforms for Better Future*. Media Release, Northern Territory Minister for Racing, Gaming and Licensing. Northern Territory Government. Accessed at: <http://newsroom.nt.gov.au/index.cfm?fuseaction=viewRelease&id=4359&d=5>
- Delfabbro, P. & Le Couteur, A. (2005). *Australasian Gambling Review (AGRI): First edition covering 1992-2005*. Report Prepared for the Independent Gambling Authority of South Australia. Adelaide, S.A.
- Doran, B., McMillen, J., & Marshall, D. (2007). A GIS-based investigation of gaming venue catchments. *Transactions in GIS*, 11(4), 245-265.
- Eltridge, F. & Delfabbro, P. (2006). *Evaluation of 2004 Legislative Amendments to Reduce EGMs*: Research Report prepared for the Independent Gambling Authority of South Australia. Adelaide, S.A.
- Fogarty, C., & Young, M. (2008). *Gambling harm-minimisation measures post 1999: An Australian overview with particular reference to the Northern Territory*. Darwin: School for Social and Policy Research, Charles Darwin University.
- Livingstone, C. (2001). *Regional caps on poker machine numbers: Impacts, potential impacts, and issues*. Discussion paper prepared for the City of Darwin. Melbourne: Australian Institute for Primary Care, La Trobe University.
- Marshall, D. C. (1999). Adelaide's pokie geography: distribution of, and expenditure on, electronic gaming machines in Adelaide. *South Australian Geographical Journal*, 98, 19-29.
- Marshall, D. C. (2005). The gambling environment and gambler behaviour: evidence from Richmond-Tweed, Australia. *International Gambling Studies*, 5(1), 63-83.
- Marshall, D. C., & Baker, R. G. V. (2001a). Clubs, spades, diamonds and disadvantage: the geography of electronic gaming machines in Melbourne. *Australian Geographical Studies*, 39(1), 17-33.
- Marshall, D. C., & Baker, R. G. V. (2001b). Unfair odds? Factors influencing the distribution of electronic gaming machines in Melbourne. *Urban Policy and Research*, 19(1), 77-92.

- Marshall, D. C., & Baker, R. G. V. (2002). The evolving market structures of gambling: Case studies modelling the socioeconomic assignment of gaming machines in Melbourne and Sydney, Australia. *Journal of Gambling Studies*, 18(3), 273-290.
- Marshall, D. C., McMillen, J., Niemeyer, S., & Doran, B. (2004). *Gaming Machine Accessibility and Use in Suburban Canberra: A Detailed Analysis of the Tuggeranong Valley*. Canberra: The Centre for Gambling Research, Australian National University.
- McMillen, J., & Doran, B. (2006). Problem gambling and gaming machine density: socio-spatial analysis of three Victorian localities. *International Gambling Studies*, 6(1), 5-29.
- McMillen, J., & Togni, S. (2000). *Study of Gambling in the Northern Territory 1996-97*: Australian Institute of Gambling Research, University of Western Sydney.
- Memmott, P., Long, S., & Thomson, L. (2006). *Indigenous Mobility in Rural and Remote Australia*. Brisbane: Australian Housing and Urban Research Institute. Queensland Research Centre.
- Mitchell, A. (1999). *The ESRI Guide to GIS Analysis: Volume 1*. Redlands, California: ESRI Press.
- National Gambling Impact Studies Commission (1999). *National Gambling Impact Study Report*. National Gambling Impact Study Commission, Washington, D.C.
- National Opinion Research Centre, Gemini Research, the Lewin Group and Christiansen/ Cummings Associates (1999). *Gambling Impact and Behaviour Study: Final Report to the national Gambling Impact Study Commission*, University of Chicago.
- Productivity Commission. (1999). *Australia's Gambling Industries: Inquiry Report No.10*. Melbourne: Productivity Commission.
- Productivity Commission. (2004). *Economic Implications of an Ageing Australia: Draft Report*. Melbourne: Commonwealth of Australia.
- Samuelson, P.A., Hancock, K., Wallace, R. (1975). *Economics: Second Australian Edition*. Sydney: McGraw-Hill.
- South Australian Centre for Economic Studies. (2005). *Community Impacts of Electronic Gaming Machine Gambling (Part A)*. Melbourne: Department of Justice, State of Victoria.
- Tourism NT. (2008). *Tourism Overview – Year Ending December 2007*. Darwin: Tourism NT.
- Tyler, W. & Morrison (1996). Dimensions of disadvantage: Developing small area indicators for remote Australia. *Australian Journal of Social Research*, 2(1), 59-80.
- Walker, D. M., & Jackson, J. D. (2008). Do U.S. Gambling Industries Cannibalize Each Other? *Public Finance Review*, online first.
- Young, M., Abu-Duhou, I., Barnes, T., Creed, E., Morris, M., Stevens, M., et al. (2006). *Northern Territory Gambling Prevalence Survey 2005*. Darwin: School for Social and Policy Research, Charles Darwin University.
- Young, M., & Stevens, M. (submitted manuscript). "The games people play": An analysis of the relationships between social context, gambling participation and risk. *International Journal of Mental Health & Addiction*.
- Young, M., & Tyler, W. (2008). Mediating markets: Gambling venues, communities and social harm. *Gambling Research*, 20(1), In press.

Young, M., Tyler, W., & Lee, W. (2007). *"Destination-Style Gambling": A Review of the Literature Concerning the Reduction of Problem Gambling and Related Social Harm Through the Consolidation of Gambling Supply Structures*. Darwin School for Social and Policy Research, Charles Darwin University.