

A comparison between noise legislations in Macao, other Greater China regions, and Singapore

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Abstract: New noise law has come into effect recently in Macao, a 30-km² city well known as the world's gaming center. As a popular tourism and gambling hotspot located in southern China, Macao is busy with workforce and visitors almost around the clock. This unique pattern of activities places challenges in keeping potential noise impacts upon residential areas to an acceptable level. It is not difficult to imagine that the number of noise complaints have been rising over the past few years making noise one of the primary environmental issues. This paper presents an overview of the new law and highlights of the potential challenges in noise control. Comparisons shall be made to those of the nearby regions, whereby relevant experience may serve as a good reference.

Key words: environmental noise; noise law; Macao SAR

0 INTRODUCTION

Macao is one of the two special administrative regions of the People's Republic of China. It had been ruled by the Portuguese colonial government for about 440 years and used to be one of the key trading ports between the East and West^[1]. In the 1960s and 1970s, Macao's casino monopoly franchisee - Sociedade de Turismo e Diversões de Macau (STDM) started to build a number of casinos including Casino Lisboa. Later on, STDM took over the Yat Yuen Canidrome for greyhound racing and the Macau Jockey Club for horse racing in 1990. The gaming industry attracted over 7 million visitors from Hong Kong, Taiwan and some other Asian cities every year in the 1990s. Macao was portrayed as the "Monte Carlo of the Orient". On 20 December 1999, Macao was returned to the People's Republic of China. The Government of Macao Special Administrative Region decided to liberalize the gaming industry in 2001. Three gaming concessionaries were awarded to Wynn Resorts (Macao) S.A., Sociedade de Jogos de Macau (SJM - a subsidiary of STDM), and Galaxy Casino Company in 2002. As a concessionaire was allowed to issue a 'sub-concession', another three operators including MGM Mirage (with Pansy Ho), Venetian, and Melco-PBL entered the gaming market sequentially. The gaming operators have invested heavily in Macao and

built mega casinos, four- and five-star hotels, shopping centers, exhibition and convention centers, and resorts in the past ten years. The number of casinos increased from 11 in 2002 to 35 in 2014 while the number of four-star or above hotels increased from 17 to 41 during the same period. Besides, the number of visitors increased from 11.5 million in 2002 to 31.5 million in 2014. The surge of visitors is mainly due to the fact that mainland China started to allow over 270 million residents in 49 mainland cities to visit Macao (and Hong Kong) under the Individual Visit Scheme in 2013. In 2014, about 70 percent of visitors came from China, followed by ~20 percent from Hong Kong. Macao's gross domestic product (GDP) increased from USD 7.0 Billion in 2002 to USD 55.4 billion in 2014. Gaming revenues increased from USD 2.8 billion in 2002 to USD 43.9 billion in 2014, surpassing that of Las Vegas Strip at USD 6.4 billion by about 585 percent. Macao emerges as the world's gaming center^[2,3].

Although the aforementioned figures have painted a promising picture of Macao's development in the past decade, the rapid change has unavoidably brought with it enormous environmental and social problems. As the number of residents including permanent residents and people working in Macao under temporary work permits increased from 0.49 million in 2002 by 57 percent to 0.77 million in 2014 while the number of visitors increased by 173 percent during the same period. With a land area of 30 km², Macao's population density is the highest one in the world at 25,667 people per km². On 22 February 2015 (the fourth day of Lunar New Year), the number of income visitors exceeded more than 0.41 million, meaning that Ma-

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cao's people density on that day might reach almost 40,000 people per km². Figures 1(a) and 1(b) shows how crowded Macao truly was during the peak traveling season. The pressure generated by human activities on the environment and community was (still is) enormous. According to the statistics provided by the Macao Environmental Protection Bureau^[4] and Macao Statistics and Census Service^[5], noise was (still is) one of the key environmental issues and the number of complaints on noise was far greater than the number of complaints on air quality. There were 5,667 cases of noise complaints, comparing to 346 cases of air pollution complaints in 2013^[5].



(a) Crowd - Macao's shopping spot



(b) Control near a Macao's tourist spot

Fig.1 Pictures taken on 22 February 2015

Hence, we will review the historical data of noise complaints in Macao and identify the changing pattern of noise issues in the next section. We also present the coverage of new noise law in Macao and discuss the potential challenges in noise control. Finally, we make a comparison between the new noise law and those adopted in nearby regions and make some suggestions and recommendations.

1 NOISE COMPLAINTS IN MACAO – 2000 to 2013

According to the statistics provided by Macao Statistics and Census Service^[5] and^[6], the number of

noise complaints increased from 1,950 in 2000 to 5,667 in 2013. Figure 2 shows the change in the number of noise complaints from 2000 to 2013. One can observe that the number of complaints increased steadily and quickly between 2005 and 2010. In the past few years, the average number of noise complaints was about 5,650. As most of the noise complaints were filed to the Macao Public Security Police about noise from neighbors, the police frequently issued warnings to offenders i.e. noise sources in order to mitigate the impacts of noise on complainants i.e. sensitive receivers.

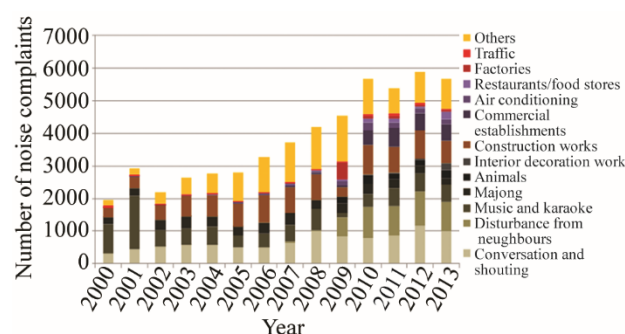


Fig.2 The number of noise complaints from 2000 to 2013

Figures 3(a)-(d) shows the categories of noise complaints in 2000, 2005, 2010, and 2013 respectively. Figure 3(a) indicates that music and karaoke was the dominant noise issues in 2000 with 897 complaints, followed by another two categories of noise from neighbors including conversation and shouting with 303 complaints and majoring with 229 complaints. There were 276 complaints on noise from construction works in 2000. In 2013, there were 1,005 complaints on conversation and shouting from neighbors, followed by 895 complaints on disturbance from neighbors and 691 complaints on noise from construction works. In the same year, there were 538 complaints on noise due to music and karaoke, and 276 complaints on noise from animals (mainly dogs). In 2010 and 2013, there were more than 440 complaints on noise from commercial establishments. Before 2006, the number of noise complaints on noise from commercial establishments was either 0 or less than 5 per year.

According to the State of the Environment of Macao 2012 and 2013^[4], 78 percent noise complaints were filed during the night-time while 22 percent noise complaints were filed during the day-time. The leading causes of night-time noise complaints were conversation from shouting from neighbors and music

and karaoke from neighbors while the leading causes of day-time noise complaints were interior decoration work and construction work.

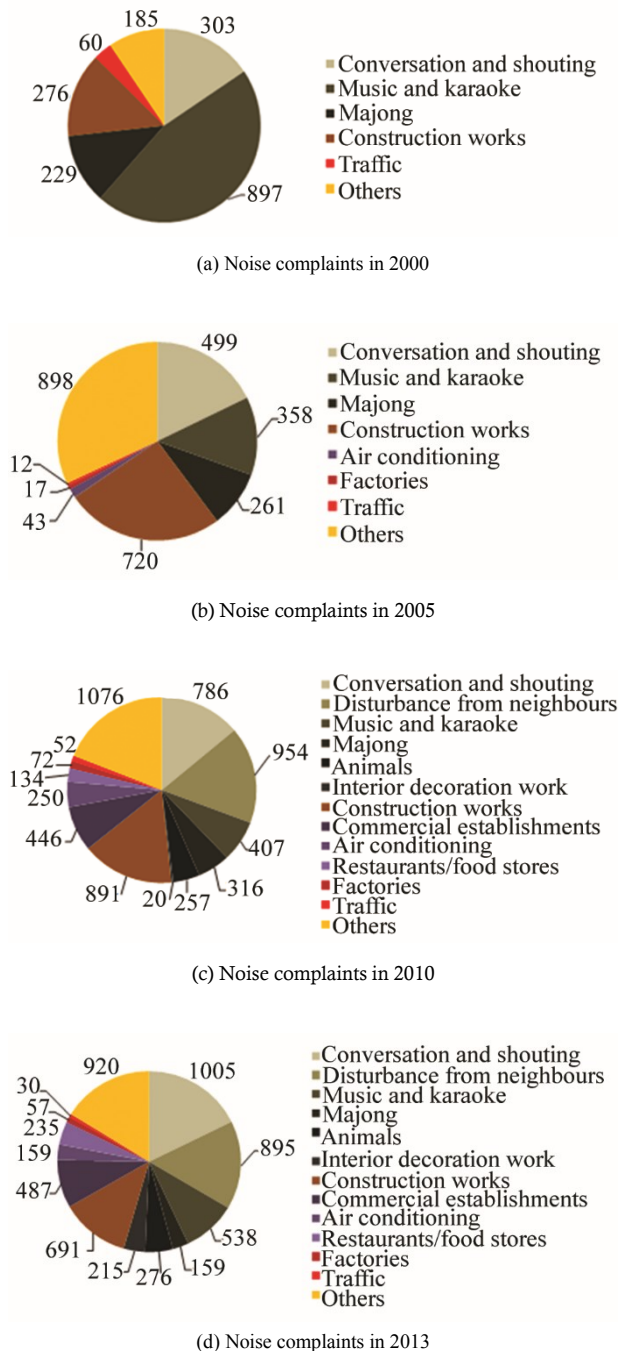


Fig.3 The number of noise complaints in 2000, 2005, 2010 and 2013

2 NEW NOISE LAW IN MACAO AND ITS CHALLENGES

On 22 February 2015, the Prevention and Control of Environmental Noise Law (the new Noise Law in Macao) came into effect^[7]. The new Noise Law regu-

lates the following aspects:

- noise from daily activities in residential buildings and pets,
- interior decoration noise,
- noise from construction activities,
- noise from air conditioning and ventilation units operated by commercial establishments,
- noise from outdoor show/performance,
- noise from commercial and industrial building units, and
- noise from public places.

In particular, the new Noise Law indicates no piling activity would be allowed between 8:00 pm and 8 am during a weekday, and on Sundays and public holidays. Besides, noise from piling activities should not be higher than 85 dBA for 20 minutes.

To deal with severe issues about noise from neighbors, the new Noise Law mandates that no excessive noise should be generated in residential units between 10:00 pm and 9:00 am. The Law also indicates that no excessive noise should be generated from public places between 10:00 pm and 9:00 am from Sunday to Friday, and between 11:00 pm and 9:00 am on Saturdays and public holidays. The Law and its associated “Acoustic Principles” stipulate that the day-time background noise levels should be 60 dBA in Macao, 56 dBA in Taipa, 55 dBA in Cotai, and 50 dBA in Colane, respectively while the night-time background noise levels should be 53 dBA in Macao, 50 dBA in Taipa, 48 dBA in Cotai, and 44 dBA in Colane, respectively. Excessive noise can be defined as 10 dBA or above higher than background noise level. It should be determined by measuring the concerned noise level in $L_{eq,30-min}$ (or more) at the receiver position using a Type 1 or Type 2 sound level meter (as specified by CEI-61672).

The Law indicates that the control of noise from daily activities in residential buildings and pets, and the control of noise from public places are enforced by the Macao Public Security Police while the control of noise from all other activities is enforced by the Macao Environmental Protection Bureau.

The enactment of the Law is not without challenges. Noise is unwanted sound and depends significantly on objective measurement i.e. sound level measurement as well as subjective judgment. Definitely, having the new Noise Law is a good policy but if the Macao Government would like to turn Macao into a good place for living. Noise control at source is the most efficient and effective approach for solving

noise problems. Hence, the understanding and awareness of the characteristics of noise, noise physiological and psychological effect on human well-being and other species, and how to mitigate and control noise should be raised among citizens, visitors, event organizers, organizations, etc.

3 COMPARISON THE NOISE LAW IN MACAO AND NOISE CONTROL ORDINANCES/REGULATIONS/LAWS IN THE NEARBY REGIONS

Table 1 shows the new Noise Law in Macao, the Noise Control Ordinance in Hong Kong, and the related Noise Regulations in Singapore, the Noise Control Act in Taiwan, and the Law of the People's Republic of China on Prevention and Control of Pollution from Environmental Noise. It shows that the new Noise Law in Macao is in line with those noise control ordinance/regulations/act in the nearby regions. However, Macao is a tourist center specializing in the

gaming industry. Among the 0.4 million workers in Macao, 25 percent of them i.e. 0.1 million are employees working in the gaming industry and its associated industries such as casinos, resorts, hotels, and restaurants^[7]. Many of these workers have to work morning shift, evening shift, and night shift alternatively. As a result, employees who work in the night shift need to rest during the day-time and inevitably can be adversely affected by noise from neighbors, public places, traffic, and construction sites. On the other hand, employees who work in the evening shift will prepare their meals, talk to their friends and family members, and even play mahjong with friends at midnight. The Macao Government shall consider how to balance the sustained economic development and the quality of human life. The day-time acceptable noise levels for most people may not be 'acceptable' under Macao's unique round-the-clock (i.e. 7/24/365) environment. Education about noise and noise effect on physiological and psychological well-being must be provided to all people no matter what their background, such as gender, age group, educational level, race, etc.

Table 1 – Noise related laws in Macao SAR, Hong Kong SAR, Singapore, and Taiwan

	Macao SAR	Hong Kong SAR	Singapore	Taiwan	China
Noise Law/ Ordinance/ Regulations/ Act	Prevention and Control of Environmental Noise Law (Law no. 8/2014) ^[8]	Noise Control Ordinance ^[9]	Environmental Protection and Management Regulations ^[10,11]	Noise Control Act ^[12]	Law of the People's Republic of China on Prevention and Control of Pollution from Environmental Noise ^[13]
Effective from	Feb 2015	Mostly from 1989 (updated 2001)	April 1999 (updated 2009)	1984 (updated 2008)	March 1997
Coverage	Noise from -residential units -public places -commercial units -industrial units -construction sites	Noise from -residential units -public places -commercial units -industrial units -construction sites -specific construction equipment -motor vehicles	Noise from -construction sites -industrial units - new and in-use vehicles	Noise from -residential units -public places -commercial units -industrial units -construction sites -road transport -air transport -wind farm	Noise from -industrial units -construction activities -transportation sources -social activities
Background noise levels for residential areas	Day: 50~60 dBA Night: 44~53 dBA				
Acceptable noise levels for residential units	Day: 60~70 dBA Night: 54~63 dBA	Day: 60~70 dBA Evening: 60~70 dBA Night: 50~60 dBA	Day: 65~75 dBA Evening: 60 dBA Night: 55 dBA	Day: 50~65 dBA EM&E: 45~60 dBA ¹ Night: 40~55 dBA	Day: 50~60 dBA Night: 40~50 dBA

Note ¹: EM&E stands for early morning (between 5am and 7am) and evening (between 8 pm and 10 pm)

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中国澳门特别行政区与中国其他地区以及新加坡 噪声法的比较

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摘要: 澳门新噪声法最近已经生效。澳门是一个约 30 平方公里的城市, 也是世界博彩中心。近年澳门成为南中国一个极受欢迎的博彩和旅游城市, 市民和游客几乎昼夜不停地工作和娱乐。这种独特的社会模式给澳门居民带来噪声压力。在过去的几年里, 噪声是澳门主要环境问题之一, 噪声投诉的数量亦一直在上升。文章介绍澳门新噪声法及其潜在挑战, 同时比较澳门及邻近地区的噪声法, 以作参考。

关键词: 环境噪声; 噪声法; 中国澳门特别行政区

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