道路安全研究小組
Community for Road Safety

2018 年 2 月 14 日

致

香港中區立法會道 1 號

立法會綜合大樓立法會秘書處

立法會交通事務委員會主席

易志明議員

尊敬的立法會交通事務委員會議員

**公共交通安全意见**

2018 年 2 月 10 日大埔公路發生巴士車禍造成嚴重傷亡，對此本會深表難過。

過去三年，本會一直向交通事務委員會提出有關公共交通安全的意見，配合九巴專營權及公共交通策略研究等會議議題。

為了配合委員會在 2018 年 2 月 15 日的特別會議，我們重新將本會過去的意見書列出，並特別附上 2017 年 6 月 16 日（公共交通策略研究）及 2016 年 6 月 21 日（九巴專營權）的意見書，讓立法會議員參考。本會樂意進一步協助委員會探討道路安全議題。

| 會議日期 | 道路安全研究小組意見書題目 |
|---|---|
| 2017 06 16 | 《公共交通策略研究》報告- 交通安全<br>http://www.legco.gov.hk/yr16-17/chinese/panels/tp/papers/tp20170616cb4-1231-3-c.pdf |
| 2016 12 16 | Comments on “Increasing the Seating Capacity of Light Buses”<br>http://www.legco.gov.hk/yr16-17/english/panels/tp/papers/tp20161216cb4-323-1-e.pdf |
| 2016 06 21 | 九龍巴士(一九三三)有限公司巴士網絡的新專營權事宜- 新專營權公眾諮詢結果報告<br>http://www.legco.gov.hk/yr15-16/chinese/panels/tp/papers/tp20160621cb4-1129-3-ec.pdf |
| 2016 06 21 | 《公共交通策略研究》《角色定位檢視》 優質的士及增加公共小巴座位<br>http://www.legco.gov.hk/yr15-16/chinese/panels/tp/papers/tp20160621cb4-1129-1-c.pdf |
| 2015 07 06 | Public Transport Strategy Study – Taxi Service<br>Recommendation to incorporate “Road Safety” into the Focused Study |
| 2015 05 05 | Comments on the Scope of the Public Transport Strategy Study (PTSS) - Minibuses<br>http://www.legco.gov.hk/yr14-15/english/panels/tp/papers/tp20150505cb4-867-7-e.pdf |
| 2015 02 09 | Comments on the Scope of the Public Transport Strategy Study (PTSS)<br>http://www.legco.gov.hk/yr14-15/english/panels/tp/papers/tp20150209cb4-447-3-e.pdf |

此致，

鄺子憲

道路安全研究小組主席

道路安全研究小組
Community for Road Safety

2017 年 6 月 13 日

致
香港中區立法會道 1 號
立法會綜合大樓立法會秘書處
立法會交通事務委員會主席
陳恆鑌議員

2017 年 6 月 16 日會議
《公共交通策略研究》報告- 交通安全

尊敬的立法會交通事務委員會議員

**《公共交通策略研究》報告- 交通安全**

《公共交通策略研究》報告( 下稱報告 )第 1.6 章節指出「現時香港公共交通服務整體大致運作良好，既能在商業營運的原則下維持服務效率、質素的同時，亦為市民提供多元的選擇。。。。據 2014 年一項國際調查顯示，香港的公共交通服務在 84 個城市當中排行榜首。」

與此同時，根據香港警方 2017 年 2 月 22 日的新聞公佈，2016 年涉及公共服務車輛 ( 包括的士、專營公共巴士、公共小巴、私家小巴及私家學童小巴 ) 的交通意外有 6803 宗，佔整體交通意外數字的 42%，導致 9210 人傷亡，當中 48 人死亡。

警方在上述新聞公佈後隨即展開為期五日的全港公共服務車輛安全執法行動。這類執法行動對於積弊已久的問題，只能算杯水車薪，缺乏實質成效。單是 2017 年 4 月 11 日至 5 月 6 日，我們紀錄到涉及公共小巴的車禍導致最少 3 名行人死亡，4 人危殆，情況令人痛心！

警方數字反映香港公共交通服務效率背後的沉重代價，但《報告》對公共交通安全表現卻避而不談，錯過了把握這次策略研究提升公共交通安全的機會。

《報告》第 2.4 章節指出《公共交通策略研究》的《專題研究》「就現時公共交通業界較為關注、有迫切性而，需優先處理的 8 個指定的課題進行檢討」。不過《專題研究》完全不包括公共交通的安全表現，顯示當局認為安全問題沒有迫切性。

我們要指出，公共交通的服務水平包括效率，質素及安全，而保障乘客及各道路安全使用者的安全理應是核心價值。《報告》只重視效率議題，將難以全面提升本港公共交通的服務水平。

**公共交通安全一些基本情況**（資料來自運輸署車禍數據及各大報章新聞）

- 小巴在 2011 至 2015 的五年間導致 60 名行人死亡，按行車里程的發生率竟是其他車輛的 7 倍。
- 的士車禍每年涉及的士總數目四分之一，每年約有 1600 名的士司機及 1200 的士乘客受傷。
- 的士在 2011 至 2013 的三年間導致 30 名行人死亡，按行車里程的發生率是私家車的 1.8 倍。
- 2010-2017 年間涉及失控車輛撞擊巴士站的車禍導致最少 68 名使用巴士站乘客受傷，當中 4 人死亡，14 人危殆或重傷。
- 公共巴士每年涉及超過 700 乘客失去平衡跌傷的有紀錄事故，當中約 10%重傷。
- 2011-2013 九巴涉及 12 名行人死亡，部分是由於巴士失控衝上行人路造成。
- 九巴每年涉及 70-80 名行人受傷，當中 30%重傷。
- 城巴在 2006 年中至 2013 年底涉及 210 名行人受傷，當中 7 人死亡，62 人重傷。
- 2009 年至今發生最少 5 宗雙層巴士翻側事故。
- 主要公路前後相撞（追撞）事故時有發生，造成大量乘客受傷，部分乘客由於座位設計缺陷重傷甚至死亡，典型車禍包括：
  - 2016 年 12 月 25 日：新田公路涉及巴士車禍導致 42 人受傷，當中 2 人危殆，4 人重傷
  - 2017 年 4 月 19 日：元朗公路涉及巴士車禍導致 70 人受傷
- 2015 年涉及公共交通車輛單一事故超過 10 人受傷的車禍 38 宗，超過 20 人受傷的車禍 7 宗，與 2000 年代初水平相若。

**公共交通的安全風險**

- 政府，公共交通機構及業界對安全問題綜合認識不足，缺乏改進積極性。
- 公共交通機構及業界在營運效率及經營環境等實際考慮下，容易犧牲安全。
- 本港公共交通普遍使用山區道路，但不少此類道路缺乏合適防護措施，存在車輛墜山的嚴重安全風險。
- 本港公共交通普遍使用高速道路，但此類道路仍存在不少安全缺陷，例如缺乏護欄連接或存在開端斜台，可導致雙層巴士翻車或墜坡。
- 本港市區人車密集，50 公里限速本身過度寬鬆，公共交通車輛由於車身重量及盲點，對行人構成嚴重威脅。
- 由於缺乏撞擊變形空間，雙層巴士上層前排座位風險很高，相撞事故容易導致乘客嚴重受傷。
- 由於缺乏撞擊變形空間，小巴士後排座位風險很高，相撞事故容易導致乘客嚴重受傷。
- 本港長者人口持續增加，對於公共交通的安全問題帶來更多挑戰。
- 2012 年 4 月 13 日實施的多項改善小巴安全措施缺乏效果評估，成效存疑。

**改善公共交通安全的機遇**

- 強制或鼓勵業界採納針對交通及物流業的 ISO39001「道路交通安全管理系統」。
- 有效利用 GPS 及其他先進實時監控系統，並結合道路風險預防公共交通車禍。
- 建立科學的公共巴士行車安全守則，並通過車速，三維加速度及視像監控系統有效實施守則，矯正個別司機不良駕駛習慣，例如：
  - 市區道路巴士車速不應高於 40 公里，繁忙街道不應高於 30 公里
  - 個別高危路段（山區，長下坡，缺乏防護等）設定合適限速
  - 監控慣性緊貼前車的不當行為
  - 監控慣性的過度加速，減速及高速轉彎行為
  - 巴士總站內車速不應高於 15 公里
- 研究改進大型公共交通車輛的盲點問題。
- 研究提升保護措施，改善巴士站候車乘客的安全。
- 研究改進巴士小巴內高危座位的保護設計。
- 優先強制所有使用高速道路的小巴裝設三點式安全帶。

此外，還有更多政策及技術的改進機遇需要探討。

提升公共交通安全的目標不單是為了保障乘客及其他道路使用者，也是為了做福整體業界及從業員，令他們在有利可圖及得到市民尊重下提供高效，高質素及安全的服務。

我們認為當局必須立即開展對公共交通安全的研究。坦誠面對問題並從制定真正具成效的策略，有系統地提升公共交通安全。

此致，

鄺子憲
道路安全研究小組主席

道路安全研究小組
Community for Road Safety

2016 年 6 月 16 日

2016 年 6 月 21 日會議
九龍巴士(一九三三)有限公司巴士網絡的新專營權事宜- 新專營權公眾諮詢結果報告

致
香港中區立法會道 1 號
立法會綜合大樓立法會秘書處
立法會交通事務委員會主席
田北辰議員

九龍巴士(一九三三)有限公司巴士網絡的新專營權事宜- 新專營權公眾諮詢結果報告

為響應上述公眾諮詢， 我們於 2016 年 4 月 18 日向政府提交一份意見書， 針對巴士安全的持續改善，內容包括安全管理系統及一系列具體課題。

政府提交立法會交通事務委員會的文件 CB(4)1124/15-16(05)《九龍巴士(一九三三)有限公司巴士網絡的新專營權事宜- 新專營權公眾諮詢結果報告提供的文件》只有兩點關於安全的的簡單敘述，分別為「更嚴格監察巴士車長的駕駛行為」及「改善車廂內的安全設施」。我們認為這樣遠遠未能確實反映諮詢意見書涵蓋的觀點。

由於巴士安全是非常重要的課題，我們在此將諮詢意見書的原文 ( 只有英文版 ) 直接提交立法會交通事務委員會作為參考。

此致，

鄺子憲
道路安全研究小組主席
(已簽署)

道路安全研究小組
Community for Road Safety

16 June 2016

The Chairman
LegCo's Panel on Transport
Legislative Council Secretariat,
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong

Attention : Hon. Tien Pak-sun Michael

Dear Legislative Council Members,

Administration's Paper on New Franchise for Bus Network of the Kowloon Motor Bus Company (1933) Limited - Report on The Public Consultation on the New Franchise

In response to the above public consultation, we submitted a document to Government on 18 April 2016. Our comments focus on continuous safety improvement for bus operation. The contents cover a safety management system in conjunction with a series of specific topics.

The document submitted by Government to LegCo's Panel on Transport CB(4)1124/15-16(05) "Administration's paper on new franchise for bus network of the Kowloon Motor Bus Company (1933) Limited - report on the public consultation on the new franchise" only consists of a short paragraph on safety with two simplified points, namely "to monitor bus captains' driving behaviour more closely" and "to improve safety facilities on buses". These clearly fail to reflect the much broader issues we raised.

Bus safety is a very important topic. For this reason we consider that it is necessary to submit our original document directly to LegCo's Panel on Transport for reference.

Yours faithfully,

Julian TH Kwong
(signed)
Chairman, Community for Road Safety

道路安全研究小組
Community for Road Safety

# New Franchise for Bus Network of The Kowloon Motor Bus Company (1933) Limited

Comments

## Overview

This paper provides recommendations to further improve the safety performance of Kowloon Motor Bus Company (1933) Limited (KMB) under the new franchise.

Cl. 4 of the consultation document by Government states that "The Government's key consideration in granting or extending a bus franchise is whether a grantee is capable of providing a proper and efficient bus service".

We believe that "Safety" must also be included as a primary objective.

It is agreeable that KMB has been providing generally satisfactory service and has become increasingly serious with safety. There are many good aspects of KMB's operation e.g. modern bus fleets, maintenance standard, drivers' training program. Cl. 8 of the consultation document cited KMB's efforts to improve safety with respect to drivers' rest time, health checks, speed limiters and black boxes. While these are all relevant and appreciated, many casualties could still be reasonably preventable. It is important not to miss the opportunities to further enhance KMB's safety performance with the new franchise.

**Road Safety is of Paramount Importance**

Cl. 6 (c) of the document indicates that KMB's accident rate was 2.95 accidents per million veh-km which is lower than 4.16 of the overall industry performance. While this indicates better overall performance of KMB, we consider it grossly inadequate to look at a single parameter i.e. accident rate per million veh-km, to conclude on KMB's safety performance. Due to the scale of its operation, KMB accounts for more than half of the bus-related casualties. This justifies a major effort to further bring down the casualty toll.

It will be necessary to analyse the number and rates of KMB buses involved in fatal and serious accidents, pedestrian accidents, multi-casualty accidents etc from a much wider perspective. It is also important to identify and address any major safety risks involving KMB's operation.

***Rear-front and Junction Collisions***

Given the prevalence of bus routes using high speed roads and expressways, KMB buses are particularly susceptible to rear-front collisions involving multiple casualties. During the three year period 2011 to 2013, there were over 40 multi-casualty crashes each with 5 or more casualties involving KMB buses. Historically, a single event with more than 100 casualties has been recorded. Such collisions could lead to very severe casualties especially for passengers taking up certain seats e.g. upper floor front row. Furthermore these events often put enormous strain on the emergency and medical service. Nevertheless, such events would only be classified as a single accident and therefore their severity cannot be reflected in the accident rate. In July 2015 alone, there were at least three multi-casualty collisions involving KMB buses resulting in 45 casualties.


*source of photo: Oriental Daily*

*Aftermath of a rear-front collision on an expressway*

***Passengers losing balance***

Our estimate from accident data is that some 1,000 KMB occupants are injured every year. Some of these are due to collisions and some are due to passengers losing balance. The number of KMB passenger casualties due to losing balance or boarding/alighting a bus is in the order of 300-400 per year and the number of serious injuries is in the order of 40 to 50 with fatalities in the order of one per year. Furthermore, it is likely that many casualties went unreported. Presumably elderly persons are most susceptible to these accidents, yet Hong Kong is expecting an ever growing population of elderlies in the decades to come. These accidents need to be addressed systematically with meaningful targets of reduction.

***Pedestrian Collisions***

Our initial estimate also suggests that 70 to 80 pedestrians were knocked down by KMB buses every year. About 30% of these pedestrians sustained severe injuries. Over the three year period 2011 to 2013, twelve pedestrians died after being knocked down by KMB buses when crossing the road while a few died as a result of KMB buses crashing onto footpaths or losing control after a primary collision. Overall, pedestrians account for more than half of the fatal collisions involving a KMB bus. Irrespective of the circumstances of happenings and responsibility, this is not a trivial issue and certainly an area for improvement.

***Overturning Accidents***

Overturning of double decker bus could result in large number of fatalities and severe casualties. Such scenarios involving KMB buses continue to happen. This is unacceptable even though some of these happened with buses not in service for the general public.

- 9 November 2009 Tseung Kwan O
- 11 March 2011 Yuen Long
- 12 June 2015 Lung Cheung Road
- 8 February 2016 Yuen Long

***Roadside Risks***

Other than actual accidents, the safety of a bus carrying up to 130 passengers needs to be addressed from the perspective of risk. In this context we have been raising alert of the risk of buses falling off steep side slopes on highways. Our site inspections suggest that many steep side slopes, e.g. those along Clear Water Bay Road or Hiram's Highway, are not guarded or only lightly guarded by weak safety barriers. These are grossly inadequate to stop a runaway bus from falling off the slopes. The consequences of a bus skidding or losing control at these locations would be disastrous with massive fatalities and casualties. Given the lack of

recognition of this problem and very slow pace of road improvements, it would be up to the bus companies to compensate for the risks through education of their drivers and very stringent speed control when passing these highly risky road sections.

*These rigid concrete bus stop canopies could destroy the entire upper deck of an errant double decker bus. Interim measures would include protocols requiring bus drivers to slow down as they exit from the high speed road*

***Recommendations***

We recommend that past accident data and potential safety risks of bus operation are studied in detail, with a view of identifying opportunities for improvements under the new franchises. Government should take the lead to emphasize the importance of road safety of bus operation. The franchise requirements should incorporate these aspects in addition to proper and efficient service. Consideration could be given to rewarding the bus companies for achieving predefined goals, such as reduction of certain accident types by 20% per year.

## Bus Safety – Road Safety Management System

As pointed out earlier, there is every reason to address safety performance of bus companies from the perspective of both accident data and risks. It follows that a modern approach should be introduced. One of the most important recent developments for fleet safety management worldwide is ISO 39001 “Road Traffic Safety Management”. This quality assurance system encourages fleet operators to be far more accountable and proactive in reducing accidents and risks.

*Recommendations*

- Under the new franchise requirements encourage the bus companies to adopt a more advanced road safety management system towards the ISO 39001 standard.
- Government shall collaborate with the bus companies to study bus accidents and risks in details, with the view of setting targets of accident reduction.

## Bus Safety – Driving Standard

It would be fair to say that many public bus drivers are professionals and are performing reasonably well. However, this does not necessarily imply that risks have been minimised. Furthermore, a certain proportion of bus drivers do behave aggressively and dangerously contributing to undue risks. Cl. 8(d) of the consultation document states that KMB has completed retrofit of speed limiters and black box. There is vast potential of using black box in buses but it is not clear how these are being used.

We wish to point out that the legal urban speed limit of 50km/h cannot be taken as the golden rule. Buses weigh 18 to 24 tonnes and have capacity in excess of 100 passengers. They need much longer braking distance and sharp braking to avoid a collision will risk injuries to passengers. In busy urban streets and risky road sections over steep side-slopes, speeds would need to be reduced to levels commensurate with safety risks.

As an example, buses overtaking a stopped vehicle can legally travel at 50km/h on a typical multi-lane urban street despite constrained sightlines and frequent crossing pedestrians. Such speeds are very risky and suggest a lack of understanding and regulation on the part of bus companies and Government. Providing an efficient service can never be an excuse for inappropriate speeds.

*Recommendations*

- Incorporate into franchise requirement the need to set up a comprehensive standard and driver monitoring system using the installed black boxes. Monitoring systems should be automated with streamlined procedures to educate and retrain drivers.
- Key monitoring controls are:
    - Acceleration and deceleration characteristics (refer to extract below from the British Columbia Transit Infrastructure Design Guidelines) – crucial to problem of passengers losing balance.
    - Speed through risky hilly roads – e.g. 25-40km/h through known hazardous sections or points– crucial to prevention of disastrous events.
    - Speed through urban areas e.g. 20-35km/h generally on busy urban streets - – crucial to pedestrian and general safety.
    - Speed passing stopped vehicles/buses on urban streets – e.g. 20-30km/h with adequate lateral separation to minimize risk with pedestrians coming out from gaps.
    - Speed through bus terminus – e.g 15km/h or lower in compact bus termini.
    - Tailgating
    - Driving behind and around bicycles
- Through systematic and targeted safety training, drivers should be trained to understand typical accidents scenarios and specific risks.

### 4.4 Vehicle Performance

Buses generally have lower acceleration and deceleration rates compared to passenger vehicles. The acceleration and deceleration rates of transit vehicles should be taken into consideration in the design of public road and transit facilities for passenger comfort and safety. This is further discussed in Sections 5.2 and 5.3.

The Canadian Transit Handbook (Canadian Urban Transit Association and Transportation Association of Canada) suggests the desirable rates as shown in Table 4.3. The maximum deceleration rate for emergency situations should only be considered for extreme conditions, such as to avoid a collision.

*Table 4.3 Desirable Acceleration and Deceleration Rates for Bus*

| Maximum Rate | Standard Bus (m/s²) | Articulated Bus (m/s²) |
|---|---|---|
| Acceleration | 0.9 | 0.7 - 0.9 |
| Deceleration (normal service) | 1.1 | 1.1 |
| Deceleration (emergency condition) | 2.7 | 2.7 |

*Extract from the British Columbia Transit Infrastructure Design Guidelines*

## Bus Safety – Bus fleets

KMB has been investing in new modern buses. It is well agreeable that these buses are comfortable and well designed. However, attention is still required for safety risks including:

- Upper deck front seats – in the absence of any reasonable deformation zone, front row bus passengers could be crushed despite the use of safety belts. This is particularly important with the number of KMB buses using high speed roads.
- Straight stairways – passengers are prone to falling down the stairway during acceleration.
- Seat belts – Not all higher risk seats and not all buses are equipped with seat belts.
- Adjustable arm rests – these are prone to causing injuries for passengers losing balance when hitting the installations.
- Any sharp pointing objects – these are prone to causing injuries for passengers losing balance when hitting them.
- Bus door safety- this subject is given attention after recent incidents involving bus passengers breaking the glass door and falling off.

*Recommendations*

- Incorporate into franchise requirements issues to be studied and improved with timetable.

## Bus Safety – Bus Stops

KMB has been providing bus shelters and in return given the privilege of advertising at bus stops. While bus shelters are generally welcome, the safety of bus stops needs far more attention. As an example, waiting passengers along bus stops on Lung Cheung Road are left exposed to heavy and fast moving vehicles. A single runaway vehicle will result in massive casualties.

*Recommendations*

- Incorporate into franchise requirement that bus companies will collaborate with Government to reduce the risk for waiting passengers at bus stops.