

**INDEPENDENT REVIEW COMMITTEE ON HONG KONG'S
FRANCHISED BUS SERVICE**

**INDEX OF BUNDLE FOR BUS & TECHNICAL DEVICES
MANUFACTURERS**

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獨立檢討委員會

香港金鐘道 66 號
金鐘道政府合署 21 樓

本函檔號 Our Ref.: CSO/IRC-BUS/CR/7-45/16
來函檔號 Your Ref.:



Independent Review Committee on
Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

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9 May 2018

Alexander Dennis (Asia Pacific) Ltd
Units 1013-1014 Chevalier Comm Centre
8 Wang Hoi Road
Kowloon Bay
Kowloon
(Attn: Mr Andrew Boulton,
Customer Development & Technical Director)
(Fax No.: 2757 7766)
(E-mail: andrew.boulton@alexander-dennis.com)

Dear Mr Boulton,

**Request to provide written responses
to address the issues and questions set out in Annex II of this letter**

The Chief Executive announced on 13 March 2018 that an Independent Review Committee on Hong Kong's Franchised Bus Service (the Committee) had been set up, following the occurrence of the fatal incident on Tai Po Road on 10 February 2018 and other recent serious incidents involving franchised buses in Hong Kong. From the point of view of safety, the Committee is required to examine the operational management of bus franchises and the related regulatory and monitoring system of franchise buses, so as to make recommendations to the Chief Executive of safety-related measures with a view to sustaining a safe and reliable franchised bus service. The terms of reference of the Committee are set out in *Annex I* of this letter.

The Committee commenced its work on 28 March 2018 and has written to various stipulated interested parties requesting that they provide the committee with written submissions and that they respond to issues and questions posed of them by the Committee.

In written submissions provided to the Committee, the Transport Department ("TD") informed the Committee that in mid-March 2018 a working group was set up, and that meetings have taken place between representatives from the TD, all the five franchised bus operators and three bus manufacturers "to review the technical feasibility and desirability of installing some new safety devices or applying new technology on the safety devices of FB's for enhancing protection to bus passengers." We are given to understand that the three bus manufacturers are "Alexander Dennis Limited ("ADL"), Volvo and Man." The TD's submissions may be found on the Committee's website (www.irc-bus.gov.hk) in the "Hearing Bundles", at Paper 08 of the Transport Department's submissions.

It is in those circumstances, as instructed by the Chairman of the Committee, the Honourable Mr Justice Michael Lunn, that I write to request your company to provide written responses to address the issues and questions set out in *Annex II* of this letter, as well as to provide any comments that your company may wish to raise.

I should be grateful if the response of your company could reach the Secretariat of the Committee by **23 May 2018**. Please send the written response by hard and soft copies to:

By post: Secretariat to the Independent Review Committee on Hong Kong's Franchised Bus Service, 21/F, Queensway Government Offices, 66 Queensway, Admiralty, Hong Kong (*with the envelope specifying the written response is enclosed*); and

Via email: secretariat@irc-bus.gov.hk (*with the email heading specifying the written response is enclosed*)

The information provided in the written responses will be considered by the Committee in reviewing the matters it is directed to consider under the terms of reference of the Committee and in drawing up its recommendations. If necessary, the Committee may invite your company to provide supplementary written responses and/or oral evidence. Please also be advised that all written responses (including any annexes, appendices and attachments contained therein) will be treated as public information and, at the discretion of the Committee, may be published on the Committee's website.

Yours sincerely,



(CHAN Ping-fai, Peter)
Secretary, Independent Review Committee on
Hong Kong's Franchised Bus Service

Encl

**Independent Review Committee on Hong Kong's Franchised Bus Service
Terms of Reference**

From the point of view of safety, in the light of the fatal accident on 10 February and other recent serious incidents involving franchised buses in Hong Kong:

- (a) to examine the operation and management of bus franchises under the current legislative, franchise and other contractual requirements;
- (b) to examine the present regulatory and monitoring system for franchised buses; and
- (c) in relation to the above, to make recommendations to the Chief Executive on safety-related measures with a view to sustaining a safe and reliable franchised bus service in Hong Kong.

Note:

Issues relating to the causes and liability of persons involved in the fatal accident on 10 February 2018 will be investigated by the Police and fall outside the Committee's terms of reference.

1. The Transport Department's submission states that the working group had regard to international standards relevant to the security of seats and seat belt installations set by the European Community, the United Nations Economic Commission for Europe or the Federal Motor Vehicles Safety Standards, which were said to be "the most widely recognised worldwide standards" in that regard. Further, the submissions state that the franchised operators agreed to a requirement for the procurement of new buses that they be compliant with those international standards in respect of "seat belts for all passenger seats". In respect of the feasibility of retrofitting seat belts to that standard to existing double-decker buses, it was said that further study was being made.

2. If your company is involved in that further study, please provide brief details of the results.

3. The written submissions go on to state that consideration was given to the "technical feasibility and desirability of installing some new safety devices or applying new technology on the safety devices of FB's for enhancing protection to bus passengers", namely:

- "(a) Electronic stability control ("ESC") and Roll stability control ("RSC");
- (b) Capping the maximum speed at 70 km/hour on downhill by the speed limiter;
- (c) Speed controlled by Global Positioning Service ("GPS") or geo-fencing;
- (d) Speed Display Unit in passenger compartment ("SDU");
- (e) Collision prevention and lane keeping devices; and
- (f) Driver monitoring device."

ESC and RSC

4. The written submissions state that:

"One of the bus manufacturers have advised that their new and existing buses have already been equipped with ESC. As such about 2.8 % of the FB's (i.e.170 buses) in Hong Kong procured from this manufacturer have been installed with ESC.

...

The other two bus manufacturers indicate that their new buses (but not the existing buses) could be equipped with ESC."

5. Please inform the Committee if your company is the manufacturer who has already supplied franchised buses equipped with ESC or is one of the two manufacturers who could supply new franchised buses equipped with ESC and indicate if your company has supplied buses equipped with ESC in other jurisdictions, identifying the jurisdictions. If so, please provide brief details of the period of time, the model and the number of such vehicles over which those vehicles have been supplied to those jurisdictions. Is the provision of ESC in new buses a requirement by

any of the regulatory authorities in any of those jurisdictions? If so, please identify the jurisdictions.

6. Please give a broad indication of the cost implications of equipping franchised buses in Hong Kong with ESC, perhaps in relation to the overall cost of the vehicle.

Speed limiters

7. Having stated that the “current speed limiter performs its function by means of cutting fuel supply to the engine when the speed is over 70 km/hour and it cannot control speeding on downhill which is steep enough for the vehicle to be in free roll”, the written submissions assert that:

“The three bus manufacturers have initially advised that it is technically feasible to engage retarder to slow down the bus when the speed limit is over 70 km/hour under the downhill situation.”

8. (i) Please provide a brief description of the means used to effect such retardation. Does it involve engaging lower gears and the application of brakes? Are you aware of the use of such a system in buses and/or coaches and/or heavy goods vehicles in other jurisdictions? If so, please provide details of such use, including the period of time the systems have been used. If so, is their use required by the regulatory authorities in those jurisdictions? Has your company supplied vehicles equipped with such a vehicle speed retardation system in other jurisdictions? If so, please provide brief details.

(ii) Is it possible to activate the system by reference to the vehicle’s position in terms of latitude and longitude and thereby to the speed limit fixed for that place or, having regard to the nature of the road and the area, to a lower fixed speed limit?

(iii) Is it technically feasible to retrofit such a retardation system to the buses supplied to the respective franchised bus operators in Hong Kong by your company? If so, please provide in broad terms some details of the financial implications of retrofitting such a retardation system?

Geo-fencing

9. In the written submissions it is stated that:

“All the three bus manufacturers opine that the technology for speed controlled by GPS or geo-fencing is theoretically feasible. However, they have concerns on the accuracy of the GPS signals as it will be affected by the high-rise buildings of Hong Kong.”

10. (i) Given that the franchised bus operators have stated in their written submissions to the Committee that black box/GPS systems have been installed on their respective franchised buses for, it appears, some years, is your

company aware whether or not the accuracy of GPS signals is in fact affected by high-rise buildings in Hong Kong and the degree of the resulting inaccuracy? If so, and if known to your company, please describe the extent of the areas so affected. Did your company supply or install the black box/GPS systems in the buses which were supplied by your company to the respective franchised bus operators? If so, please describe in general terms the capabilities of the various systems so installed.

- (ii) Is your company aware of the use of a geo-fence system in other jurisdictions? If so, please provide brief details of its use, including the vehicles to which it is applied. If so, has your company supplied vehicles equipped for use in a geo-fence system in those jurisdictions, in particular ones which contain areas with a significant number of high-rise buildings?

SDU

11. The written submissions state:

“The three bus manufacturers have advised that it is technically feasible to install the SDU in the passenger compartment of a FB.”

12. (i) Is it technically feasible to retrofit a SDU in a franchised bus? If so, please provide in broad terms brief details of the financial implications of doing so.
- (ii) Is your company aware of the use of SDUs in buses, in particular franchised buses, in any other jurisdictions? If so, please identify those jurisdictions and, if known, please provide brief details of the use of SDUs in buses in those jurisdictions. If so, has your company supplied buses equipped with SDU's or installed SDUs to buses in those jurisdictions?

Driver monitoring device

13. The written submissions state that:

“The driver monitoring systems monitor the driving performance and alert the driver if it detects a lack of attentional drowsiness. Some systems use a camera installed on the windscreen to detect the driver's status based on the eye movement or posture.

...

...the system will give visual warning and voice alert to the driver.”

14. The submissions go on to state that:

“All the three bus manufacturers have advised that these systems are third party system and stand-alone to the bus system.

...

Two FB operators advise that they would install a similar system in four of their buses for a trial of 3 months tentatively starting from early May 2018. ”

15. Please provide brief details of the range of such driver monitoring systems. Is your company aware of the use of driver monitoring devices in buses, in particular franchised buses, or coaches in any jurisdiction? If so, please give brief details of their use, including the period over which they have been used.

16. Has your company been involved in the installation of such a system for the trial of the system by either or both of the two franchised bus operators in Hong Kong? If so, please provide brief details of the system installed.

- End -

Response from Alexander Dennis to the Request to provide written responses to address the issues and questions set out in Annex II of the letter from the Independent Review Committee on Hong Kong's Franchised Bus Service.

Please find below a response from Alexander Dennis Ltd to the letter from the Independent Review Committee on Hong Kong's Franchised Bus Service, dated 9th May. The numbers below refer to the clause numbers in Annex II of the letter.

2. Alexander Dennis has been involved in further study concerning the retrofit capability of its buses. The structure of the Enviro500MMC bus bodywork is able to have seatbelts fitted in the upper saloon. The retrofit activity would involve the replacement of all upper saloon seats as well as additional support brackets at the location where the seat meets the body side wall.

It is not possible to install seatbelts in positions in the lower saloon. This is owing to the required structure for these seats to meet the legal requirements not being incorporated into the chassis. Once the body is built, it is not possible to retrofit this as additional structure.

Please note the Enviro500MMC was introduced into Hong Kong from 2013.

5. Alexander Dennis have not delivered any buses with ESC into Hong Kong. However, such a system has been developed and new buses ordered since March 2018 will be fitted with ESC as standard for Hong Kong.

Alexander Dennis has delivered some buses into North America which have ESC fitted but this represents a very small percentage of the total number of buses produced. The buses are Left Hand Drive Enviro500's operating in Toronto and there are about 200 of them delivered over the last 2 years. Whilst they share the same name, there are very few similarities between the North American and Hong Kong variant.

6. ESC has a cost of GB£900 per bus when the system is specified as original equipment on a new bus. A retrofit solution is being explored but more test and development work would be required before it could be formally offered. The cost of such a solution would be substantially more than the OE price as a replacement EBS ECU would be required.

8 i Alexander Dennis has not fitted Active Speed Limiting to any buses to date. However as a result of recent Hong Kong enquiries this will be offered on all new buses ordered after March 2018. The on board Multiplex electrical system reviews the road speed and should the speed be detected above 70km/h then the bus will command a retarder activation to reduce the speed down to the target set speed. Note that European legislation does not allow control of the foundation brakes for this activity.

8 ii It is believed that it would be possible to develop the system further to allow the bus to further regulate its speed to lower set points. At present this has not been explored in more detail.

8 iii It is believed that it would be possible to retrofit such a system to buses fitted with EBS although the scope of work to achieve this has yet to be defined.

10 i Alexander Dennis has no first hand experience concerning the accuracy of the GPS signal within Hong Kong. We do not supply any systems which rely on the GPS network for the vehicle's operation. All systems that do use GPS are either supplied by or directly specified by our customers.

Initial concerns surrounding a GPS speed map involved areas where roads pass over or run in close proximity to each other. Examples would be where the freeways pass over streets and run parallel to them. In these situations, that there could be system confusion between roads of differing limits.

10 ii Alexander Dennis are working with Transport for London in their aim to implement Intelligent Speed Assistance project which is due to start rolling out at the end of 2018. Details of the initial trial may be found in the link below:

<http://content.tfl.gov.uk/intelligent-speed-assistance-on-london-buses.pdf>

12 i It is technically feasible to fit an SDU in all franchised buses. ADL has not explored the costs of installing such a device. This can be advised following some further research.

12 ii Alexander Dennis is not aware of such devices being requested in any other jurisdiction.

The practical effect of fitment of such a unit on the driver should be considered. What is a passenger expected to do with the speed information being shown to them? Do they actively criticise the driver for their speed control? It is unlikely that any passenger would have a better appreciation for the appropriate speed than the driver of the bus at the time. We would certainly expect that fitment of such a device could be a potential cause for conflict and driver distraction which could have exactly the opposite of the desired effect.

15 & 16 Alexander Dennis is aware of there being a number of third party systems to address the issue of driver alertness. At this time, we have not fitted such systems to any of our buses in any jurisdictions.

Andy Boulton

Customer Development & Technical Director

香港專營巴士服務
獨立檢討委員會

香港金鐘道 66 號
金鐘道政府合署 21 樓

本函檔號 Our Ref.: CSO/IRC-BUS/CR/7-45/16
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Independent Review Committee on
Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
傳真號碼 Fax No.: (852) 3104 0254

9 May 2018

Regal Motors Ltd
9/F, DCH Building
20 Kai Cheung Road
Kowloon Bay
Kowloon
(Attn: Mr Rex WONG)
(Fax No.: 2392 8709)
(E-mail: wongryh@regalmotors.com.hk)

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to address the issues and questions set out in Annex II of this letter**

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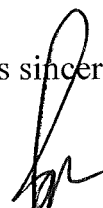
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Yours sincerely,



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any of the regulatory authorities in any of those jurisdictions? If so, please identify the jurisdictions.

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company aware whether or not the accuracy of GPS signals is in fact affected by high-rise buildings in Hong Kong and the degree of the resulting inaccuracy? If so, and if known to your company, please describe the extent of the areas so affected. Did your company supply or install the black box/GPS systems in the buses which were supplied by your company to the respective franchised bus operators? If so, please describe in general terms the capabilities of the various systems so installed.

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SDU

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Driver monitoring device

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16. Has your company been involved in the installation of such a system for the trial of the system by either or both of the two franchised bus operators in Hong Kong? If so, please provide brief details of the system installed.

- End -



Date: 31 MAY 2018

合德汽車有限公司

大昌行集團成員

REGAL MOTORS LTD.

Member of DCH Holdings

Our Ref.: MIS-030/18

Secretariat to the Independent Review Committee on Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Admiralty,
Hong Kong

Attn.: Mr. CHAN Ping-fai, Peter, Secretary

Dear Mr. CHAN,

**Responses to address the issues and questions set out in
Annex II of your letter dated 09 MAY 2018 (Your Ref.: CSO/IRC-BUS/CR/7-45/16)**

Thank you for your letter. Safety is always of our prime concern. We are of course open to cope with any technically feasible and desirable features which could help to enhance buses safety. Regarding your concerns, please find our reply to the issues and questions set out in Annex II in the following paragraphs.

Security of seats and seat belt installations

All the double-decker buses in new orders could have all the passenger seats in both upper and lower deck equipped with seat belts in compliance with the United Nations Economic Commission for Europe (UNECE) Regulation No. 14 upon operator's request.

For MAN double-decker buses in Hong Kong manufactured from 2014 onwards, all the exposed seats and the first row seats at upper deck have been fitted with seat belt. However, retrofitting seat belts to the existing MAN double-decker buses is technically feasible on the upper deck only (except the rearmost row of seats) while the existing body structure for lower deck and rearmost row at upper deck is not designed and built for seats with seat belt installation and fixed in accordance with the United Nations Economic Commission for Europe (UNECE) Regulation No. 14.

Electronic stability control (ESC) and roll-stability control (RSC)

All MAN double-decker buses in Hong Kong manufactured from 2016 onwards have been equipped with Electronic Stability Program (ESP) as factory standard which supports the driver in critical driving situations such as skidding or imminent tipping over when driving too fast in curves. Fitted with a steering sensor, yawing rate sensor and an acceleration sensor, our ESP control unit could also achieve the following features,

Dynamic stability program (DSP)

The dynamic stability program prevents understeer (front wheel slide) by braking the inner rear wheel. Oversteer (rear skid) is prevented by braking the outer front wheel.

Roll-over protection (ROP)

Before critical lateral accelerations are reached, the speed is preventively reduced by torque reduction or braking.

Speed limiters

All MAN double-decker buses in Hong Kong manufactured from 2014 onwards have been programmed to limit throttle acceleration when the vehicle exceed 70 km/h. With the latest developed program to be uploaded to the existing MAN double-decker buses which is now under testing, retarder is engaged to slow down once the vehicle goes beyond 70 km/h during downhill situation.

Geo-fencing

MIS-030/18 | P.1/2 **16-1**





Date: 31 MAY 2018

Our Ref.: MIS-030/18

All MAN double-deckers in Hong Kong manufactured from 2014 onwards could support 2 different speed limits toggling with each other subject to the appropriate signal provided from operator's device, for example, high accuracy GPS signal to operator's blackbox or telematics system.

Speed-display unit (SDU)

Speed display unit to passenger compartment is technically feasible while instant speed signal is available from vehicle CAN on all MAN double-decker buses in Hong Kong manufactured from 2014 onwards and could feed into operator's compatible display device.

Collision prevention and lane keeping device

Currently collision prevention system is only developed for application with all seated passengers who are and well protected by safety belts during hard braking. Forced braking at the last second before collision may impose irrecoverable impact and injury to standing passengers or unprotected seated passengers.

Lane keeping device will cause interference to both drivers and passengers in low-speed city-traffic and congested road conditions like Hong Kong.

Driver monitoring device

We could provide assistance and have accommodation preparation for those driver monitoring device supplied by the 3rd party.

We hope that our elaboration is clear and could help address your enquiries. Please feel free to let us know if we could of any further assistance and support.

Yours sincerely,

On and on behalf of
Regal Motors Limited



Rex WONG
Deputy General Manager



香港專營巴士服務
獨立檢討委員會

香港金鐘道 66 號
金鐘道政府合署 21 樓

本函檔號 Our Ref.: CSO/IRC-BUS/CR/7-45/16
來函檔號 Your Ref.:



Independent Review Committee on
Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
傳真號碼 Fax No.: (852) 3104 0254

9 May 2018

Volvo Bus Hong Kong Ltd
Units 1601-03, Kwun Tong View
410 Kwun Tong Road
Kowloon
(Attn: Ms Julia LU, Key Account Manager)
(Fax No.: 2827 5091)
(E-mail: Julia.lu@volvo.com)

Dear Ms LU,

**Request to provide written responses
to address the issues and questions set out in Annex II of this letter**

The Chief Executive announced on 13 March 2018 that an Independent Review Committee on Hong Kong's Franchised Bus Service (the Committee) had been set up, following the occurrence of the fatal incident on Tai Po Road on 10 February 2018 and other recent serious incidents involving franchised buses in Hong Kong. From the point of view of safety, the Committee is required to examine the operational management of bus franchises and the related regulatory and monitoring system of franchise buses, so as to make recommendations to the Chief Executive of safety-related measures with a view to sustaining a safe and reliable franchised bus service. The terms of reference of the Committee are set out in *Annex I* of this letter.

The Committee commenced its work on 28 March 2018 and has written to various stipulated interested parties requesting that they provide the committee with written submissions and that they respond to issues and questions posed of them by the Committee.

In written submissions provided to the Committee, the Transport Department ("TD") informed the Committee that in mid-March 2018 a working group was set up, and that meetings have taken place between representatives from the TD, all the five franchised bus operators and three bus manufacturers "to review the technical feasibility and desirability of installing some new safety devices or applying new technology on the safety devices of FB's for enhancing protection to bus passengers." We are given to understand that the three bus manufacturers are "Alexander Dennis Limited ("ADL"), Volvo and Man." The TD's submissions may be found on the Committee's website (www.irc-bus.gov.hk) in the "Hearing Bundles", at Paper 08 of the Transport Department's submissions.

It is in those circumstances, as instructed by the Chairman of the Committee, the Honourable Mr Justice Michael Lunn, that I write to request your company to provide written responses to address the issues and questions set out in *Annex II* of this letter, as well as to provide any comments that your company may wish to raise.

I should be grateful if the response of your company could reach the Secretariat of the Committee by **23 May 2018**. Please send the written response by hard and soft copies to:

By post: Secretariat to the Independent Review Committee on Hong Kong's Franchised Bus Service, 21/F, Queensway Government Offices, 66 Queensway, Admiralty, Hong Kong (*with the envelope specifying the written response is enclosed*); and

Via email: secretariat@irc-bus.gov.hk (*with the email heading specifying the written response is enclosed*)

The information provided in the written responses will be considered by the Committee in reviewing the matters it is directed to consider under the terms of reference of the Committee and in drawing up its recommendations. If necessary, the Committee may invite your company to provide supplementary written responses and/or oral evidence. Please also be advised that all written responses (including any annexes, appendices and attachments contained therein) will be treated as public information and, at the discretion of the Committee, may be published on the Committee's website.

Yours sincerely,



(CHAN Ping-fai, Peter)
Secretary, Independent Review Committee on
Hong Kong's Franchised Bus Service

Encl

**Independent Review Committee on Hong Kong's Franchised Bus Service
Terms of Reference**

From the point of view of safety, in the light of the fatal accident on 10 February and other recent serious incidents involving franchised buses in Hong Kong:

- (a) to examine the operation and management of bus franchises under the current legislative, franchise and other contractual requirements;
- (b) to examine the present regulatory and monitoring system for franchised buses; and
- (c) in relation to the above, to make recommendations to the Chief Executive on safety-related measures with a view to sustaining a safe and reliable franchised bus service in Hong Kong.

Note:

Issues relating to the causes and liability of persons involved in the fatal accident on 10 February 2018 will be investigated by the Police and fall outside the Committee's terms of reference.

1. The Transport Department's submission states that the working group had regard to international standards relevant to the security of seats and seat belt installations set by the European Community, the United Nations Economic Commission for Europe or the Federal Motor Vehicles Safety Standards, which were said to be "the most widely recognised worldwide standards" in that regard. Further, the submissions state that the franchised operators agreed to a requirement for the procurement of new buses that they be compliant with those international standards in respect of "seat belts for all passenger seats". In respect of the feasibility of retrofitting seat belts to that standard to existing double-decker buses, it was said that further study was being made.

2. If your company is involved in that further study, please provide brief details of the results.

3. The written submissions go on to state that consideration was given to the "technical feasibility and desirability of installing some new safety devices or applying new technology on the safety devices of FB's for enhancing protection to bus passengers", namely:

- "(a) Electronic stability control ("ESC") and Roll stability control ("RSC");
- (b) Capping the maximum speed at 70 km/hour on downhill by the speed limiter;
- (c) Speed controlled by Global Positioning Service ("GPS") or geo-fencing;
- (d) Speed Display Unit in passenger compartment ("SDU");
- (e) Collision prevention and lane keeping devices; and
- (f) Driver monitoring device."

ESC and RSC

4. The written submissions state that:

"One of the bus manufacturers have advised that their new and existing buses have already been equipped with ESC. As such about 2.8 % of the FB's (i.e.170 buses) in Hong Kong procured from this manufacturer have been installed with ESC.

...

The other two bus manufacturers indicate that their new buses (but not the existing buses) could be equipped with ESC."

5. Please inform the Committee if your company is the manufacturer who has already supplied franchised buses equipped with ESC or is one of the two manufacturers who could supply new franchised buses equipped with ESC and indicate if your company has supplied buses equipped with ESC in other jurisdictions, identifying the jurisdictions. If so, please provide brief details of the period of time, the model and the number of such vehicles over which those vehicles have been supplied to those jurisdictions. Is the provision of ESC in new buses a requirement by

any of the regulatory authorities in any of those jurisdictions? If so, please identify the jurisdictions.

6. Please give a broad indication of the cost implications of equipping franchised buses in Hong Kong with ESC, perhaps in relation to the overall cost of the vehicle.

Speed limiters

7. Having stated that the “current speed limiter performs its function by means of cutting fuel supply to the engine when the speed is over 70 km/hour and it cannot control speeding on downhill which is steep enough for the vehicle to be in free roll”, the written submissions assert that:

“The three bus manufacturers have initially advised that it is technically feasible to engage retarder to slow down the bus when the speed limit is over 70 km/hour under the downhill situation.”

8. (i) Please provide a brief description of the means used to effect such retardation. Does it involve engaging lower gears and the application of brakes? Are you aware of the use of such a system in buses and/or coaches and/or heavy goods vehicles in other jurisdictions? If so, please provide details of such use, including the period of time the systems have been used. If so, is their use required by the regulatory authorities in those jurisdictions? Has your company supplied vehicles equipped with such a vehicle speed retardation system in other jurisdictions? If so, please provide brief details.

(ii) Is it possible to activate the system by reference to the vehicle’s position in terms of latitude and longitude and thereby to the speed limit fixed for that place or, having regard to the nature of the road and the area, to a lower fixed speed limit?

(iii) Is it technically feasible to retrofit such a retardation system to the buses supplied to the respective franchised bus operators in Hong Kong by your company? If so, please provide in broad terms some details of the financial implications of retrofitting such a retardation system?

Geo-fencing

9. In the written submissions it is stated that:

“All the three bus manufacturers opine that the technology for speed controlled by GPS or geo-fencing is theoretically feasible. However, they have concerns on the accuracy of the GPS signals as it will be affected by the high-rise buildings of Hong Kong.”

10. (i) Given that the franchised bus operators have stated in their written submissions to the Committee that black box/GPS systems have been installed on their respective franchised buses for, it appears, some years, is your

company aware whether or not the accuracy of GPS signals is in fact affected by high-rise buildings in Hong Kong and the degree of the resulting inaccuracy? If so, and if known to your company, please describe the extent of the areas so affected. Did your company supply or install the black box/GPS systems in the buses which were supplied by your company to the respective franchised bus operators? If so, please describe in general terms the capabilities of the various systems so installed.

- (ii) Is your company aware of the use of a geo-fence system in other jurisdictions? If so, please provide brief details of its use, including the vehicles to which it is applied. If so, has your company supplied vehicles equipped for use in a geo-fence system in those jurisdictions, in particular ones which contain areas with a significant number of high-rise buildings?

SDU

11. The written submissions state:

“The three bus manufacturers have advised that it is technically feasible to install the SDU in the passenger compartment of a FB.”

12. (i) Is it technically feasible to retrofit a SDU in a franchised bus? If so, please provide in broad terms brief details of the financial implications of doing so.
- (ii) Is your company aware of the use of SDUs in buses, in particular franchised buses, in any other jurisdictions? If so, please identify those jurisdictions and, if known, please provide brief details of the use of SDUs in buses in those jurisdictions. If so, has your company supplied buses equipped with SDU's or installed SDUs to buses in those jurisdictions?

Driver monitoring device

13. The written submissions state that:

“The driver monitoring systems monitor the driving performance and alert the driver if it detects a lack of attentional drowsiness. Some systems use a camera installed on the windscreen to detect the driver's status based on the eye movement or posture.

...

...the system will give visual warning and voice alert to the driver.”

14. The submissions go on to state that:

“All the three bus manufacturers have advised that these systems are third party system and stand-alone to the bus system.

...

Two FB operators advise that they would install a similar system in four of their buses for a trial of 3 months tentatively starting from early May 2018. ”

15. Please provide brief details of the range of such driver monitoring systems. Is your company aware of the use of driver monitoring devices in buses, in particular franchised buses, or coaches in any jurisdiction? If so, please give brief details of their use, including the period over which they have been used.

16. Has your company been involved in the installation of such a system for the trial of the system by either or both of the two franchised bus operators in Hong Kong? If so, please provide brief details of the system installed.

- End -

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RE: Request to provide written responses to address the issues and questions set out in Annex II of the letter

23.05.2018 13:46

From: Lu Julia <julia.lu@volvo.com>
To: "secretariat@irc-bus.gov.hk" <secretariat@irc-bus.gov.hk>,

1 attachment



20180523120940142.pdf

Dear Secretariat,

Please find attached Volvo's written responses for your reference. The original will be carrier to you by today.

Thanks, Julia

From: secretariat@irc-bus.gov.hk [mailto:secretariat@irc-bus.gov.hk]

Sent: 2018年5月10日 9:43 上午

To: Lu Julia

Subject: Request to provide written responses to address the issues and questions set out in Annex II of the letter

Dear Ms LU,

Attached please find the letter for the captioned.

Secretariat, Independent Review Committee on Hong Kong's Franchised Bus Service

This email message and any attachments may contain confidential information and may be privileged. If you are not the intended recipient or otherwise not authorized to receive this message, you are prohibited to use, copy, disclose or take any action based on this email or any information contained herein. If you are not the intended recipient, please advise the sender immediately by replying to this email and permanently delete this message and any attachments from your system.



Secretariat of Independent Review Committee
On Hong Kong's Franchised Bus Service,
21/F, Queensway Government offices,
66 Queensway, Admiralty
Hong Kong

(By mail & Carrier)

Date	Telephone indialling	Telefax	Our reference
23 May 2018	+852 2827 1688	+852 2219 7088	L0523/18050/JL

Dear Secretariat of Independent Review Committee,

Volvo Bus Hong Kong appreciates the opportunity to provide additional input related to the current analysis of bus safety systems for franchise bus operators in Hong Kong.

Response to items noted in Appendix II

Item 1 – Seat Belts

At present, the use of seats belts is not a standard commonly applied on low-entry/low-floor vehicles. The use of seat belts on such vehicles requires that the floor frame of the vehicle is modified. These modifications must be undertaken to ensure that the seat (and seat belt) anchor points are indeed in line with international regulations in relation to seats and seat belts.

For Hong Kong, the addition of seat belts would require additional frame structure. This modification on existing buses would be extremely expensive as different generations of vehicle would need to be modified. For new vehicles such changes could be incorporated but they would add weight to the vehicle and reduce the current carrying capacity. This is based on the weight of seats, seat belts and body frame required to provide for seat belted seats.

In most markets the fitting of seat belts are also accompanied by rules that restrict standing. That is, if a vehicle is fitted with seat belts then standing passenger loads are not permitted. This would need to be an operational consideration.

Outside of regional and rural applications in some markets (non-city services), Volvo are not aware of the use of seat belts in low-entry/low-floor units.

With reference to our submission regarding retrofitting seat belt for existing Volvo Buses, we stated it is technical feasible but not recommended due to the CG change and weight increase.

It has to be understood that in addition to the seats that are reinforced and fitted with seat belts, there is a considerable amount of structural reinforcement built into the body structure itself. In reality to achieve a baseline 'pass' each seat and its surrounding structure will feel the effect of a 1 ton load hanging from it. Quite substantial.

In general, this extra reinforcement is hidden behind panels and FRP, some of which requires welding, bonding, riveting and bolting all of which requires exposing the bare structure. This would be a considerable undertaking. Not something Volvo/Wrights would consider doing in HK itself. At best, it could potentially be considered as a re-fit in the manufacturing plant in Malaysia.

www.volvobuses.com

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410 Kwun Tong Road, Kowloon,
Hong Kong

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Registered Office
Hong Kong

**Item 2 – Seat Belt Study**

Volvo is not involved in any ongoing study and at this stage. We would be happy to comply with any directed changes but as outlined the policy for standees, use of approved anchor points and changes to the vehicle weight need to be reviewed.

Item 3 – Safety Devices

All six of the safety devices or systems outlined can be provided by Volvo either utilising existing Volvo technology or partnering with experts in these fields and providing these items as aftermarket options.

Item 4 – ESC

Volvo would remind authorities that there are several different names on this where manufacturers try to brand the legal requirement including:

ESP – Electronic Stability Program

DTCS - Dynamic Stability and Traction Control

VSC – Vehicle Stability Control

The Volvo system (ESP) includes Yaw rate sensor, steering wheel angle sensor, lateral acceleration sensor, and wheel speed sensor (ABS).

Item 5 – ESC Supply

This feature is available on new Volvo B8L units now on order by franchise operators. The retrofit of older vehicles (Volvo B9TL) will be a development project for older vehicle electronic systems. This will attract additional cost and a development window of 18-24 months.

Item 6 – ESC Cost

This feature can be included on new vehicles (Volvo B8L) as an option for approximately HKD\$XX,000. For older units (Volvo B9TL) the cost is estimated to be approximately HKD\$XX,000.

Item 7 - Speed Limiters

Volvo has indicated that all current vehicles in Hong Kong can be speed limited to a speed designated by the operator. This speed can be adjusted as required by the operator and changed on demand. This system does not automatically apply the retarder or service brakes to slow a vehicle going downhill.

Item 8 (i) - Speed Limiters (Technology Development)

Volvo does not currently have automated braking based on speed. Volvo's vehicles are all fitted with speed limiters and are all fitted with an electronic braking system that blends the gearbox, retarder and service brakes.

Volvo's plan to provide downhill limiting functionality will include an advancement of the existing brake blending controlled electronically on the vehicle. This utilises the gearbox, retarder and service brakes "blended" to achieve the outcome desired. This blending is controlled electronically.

In downhill applications for city buses in Australia, operators utilise a low-gear lock out. That is the driver can manually "lock" the bus into a low gear for going downhill providing lower speed and control over the bus. This function can be fitted to both ZF and/or Voith transmissions and involves the fitment of a gear selection button on the dash of the vehicle.

Volvo has not provided the automated downhill braking feature in any other jurisdictions. Volvo utilises its standard electronic brake blending and low-gear lock out in a number of markets.

Item 8 (ii) - Speed Limiters (with Geo Fencing)

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See geo fencing outline below. If the vehicle was speed controlled by GPS and the unit was fitted with a speed limiting system then it would be possible to integrate the two systems. This would require both the development of the speed limiting function with automatic braking as well as the GPS based control of vehicles.

Item 8 (iii) – Speed Limiters (Retrofit)

It is possible to develop a system that engages the braking system based on speed on Volvo New Euro VI vehicles. Volvo estimates that this type of system will be able to be fitted to vehicles in Quarter 2, 2019. It is estimated that the additional cost for this feature will be HKD\$xx,xxx.

Item 9 – Geo Fencing

Volvo can provide geo-fencing capability. The accuracy as stated will rely on the accuracy of the GPS signal but also requires a full network programming exercise to be completed. That is the speed limits on all franchise bus routes need to be made available and the mapping and speed limits need to be accurate for use by vehicle systems. This project could be undertaken over a number of years to provide the basis for geo-fencing vehicles in the future. It is important that the mapping, speed zones and platform for providing these are open to the use of multiple vehicle brands and geo-fencing capable systems.

Item 10 (i) – Geo Fencing (Accuracy of GPS)

While Volvo has the capability to fit our Volvo Telematics system to vehicles, the Franchise operators are currently utilising other systems. As such Volvo cannot comment on the accuracy of these systems. Volvo is aware however that accuracy can indeed be impacted by taller buildings and the accuracy of GPS signals provided.

Item 10 (ii) – Geo Fencing (Operational Examples)

Volvo Bus has been trialling geo fencing in Sweden for almost 2 years in commercial operation on Line 55, the electric/hybrid vehicle route being run in Gothenburg. In this system there are speed zones that are controlled by GPS and environmental zones where the vehicle is directed to operate in electric only mode. This system utilises a GPRS SIM card combined with GPS signals.

Volvo would be happy to host a visit to Line 55 to show the control room, speak to operators using this style of system and demonstrate a live example of the technology.

Item 11 – SDU

Volvo confirms that it is possible to fit a SDU.

Item 12 (i) – SDU Cost/Installation

It is possible to provide the speed of the vehicle as a display in the bus. This would be a live display of the speedometer of the vehicle. The installation would require the monitor, wiring harness and output from the vehicle system. Volvo estimates the cost of installing this system at HKD\$X,XXX. Volvo would suggest that vehicles fitted with the global FMS Gateway would provide ease of speed signal access.

Item 12 (ii) – SDU Examples

Volvo is not aware of speed displays being shown in city buses in the Asia pacific or European markets. Volvo has seen the application of this technology in public transport used by some train/rail services.

Item 13 – Driver Monitoring (Operation)

Volvo is aware of a number of systems that use cameras to track the driver's behaviour including the tracking of eye movement. Volvo continue to work on these types of systems but have not released yet commercially on bus products. The reliability in different light levels, with driver's wearing glasses, etc. still provides some limitations. Development of these

www.volvobuses.com



features is ongoing and Volvo is happy to host a visit to Volvo's safety centre in Sweden to outline our progress. Until ready with our own systems, Volvo is happy to partner with third party providers.

Item 14 – Driver Monitoring (Trial)

Volvo has not been involved in the installation of units in Hong Kong.

Item 15 – Driver Monitoring (Availability)

Volvo is aware of this technology however believe it still to be in its infancy. A trial of alternate technologies is a good first step in this journey towards a system capable of actively monitoring drivers. Development of these features is ongoing and Volvo is happy to host a visit to Volvo's safety centre in Sweden to outline our progress. Until ready with our own systems, Volvo is happy to partner with third party providers.

Item 16 – Driver Monitoring (Volvo)

Volvo has not been involved in the installation of units in Hong Kong.

Volvo Recommendations

In addition to the comments outlined above Volvo Bus would make the following comments and recommendations:

Where possible the new standards should apply to new Euro 6 vehicles. This break point creates a clear differentiation between new and old vehicles.

Work on geo-fencing will require a cross industry (including Government) approach based on the need to resolve both issues with GPS accuracy and the mapping of all bus routes in Hong Kong.

Some systems can be delivered by third party providers who specialise in electronic and/or safety systems.

✓
A handwritten signature in blue ink over a blue circular stamp. The stamp contains the text "Volvo Bus Hong Kong Limited" and a star.

Julia Lu
Key Account Manager

Encl.

香港專營巴士服務
獨立檢討委員會

香港金鐘道 66 號
金鐘道政府合署 21 樓

本函檔號 Our Ref.: CSO/IRC-BUS/CR/7-45/16
來函檔號 Your Ref.:



Independent Review Committee on
Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
傳真號碼 Fax No.: (852) 3104 0254

21 May 2018

Ms Elsa WONG
Managing Director
NEC Hong Kong Limited
25/F, The Metropolis Tower
10 Metropolis Drive
Hungghom, Kowloon
(Email: solutions@nechk.nec.com.hk)

BY EMAIL & BY POST

Dear Ms WONG,

**Request to provide written responses
to address the issues and questions set out in Annex II of this letter**

The Chief Executive announced on 13 March 2018 that an Independent Review Committee on Hong Kong's Franchised Bus Service (the Committee) had been set up, following the occurrence of the fatal incident on Tai Po Road on 10 February 2018 and other recent serious incidents involving franchised buses in Hong Kong. From the point of view of safety, the Committee is required to examine the operational management of bus franchises and the related regulatory and monitoring system of franchise buses, so as to make recommendations to the Chief Executive of safety-related measures with a view to sustaining a safe and reliable franchised bus service. The terms of reference of the Committee are set out in *Annex I* of this letter.

The Committee commenced its work on 28 March 2018 and has written to various stipulated interested parties requesting that they provide the committee with written submissions and that they respond to issues and questions posed of them by the Committee.

One of the issues being examined by the Committee is the installation and use of information gathered by tachographs / black boxes in franchised buses. On this issue, the Committee notes from the website of your company that NEC Hong Kong is the supplier of the enhanced tachograph system adopted by Citybus Limited and New World First Bus Services Limited. It is in those circumstances, as instructed by the Chairman of the Committee, the Honourable Mr Justice Michael Lunn, that I write to request your company to provide written responses to address the issues and questions set out in *Annex II* of this letter, as well as to provide any comments that your company may wish to raise.

I should be grateful if the response of your company could reach the Secretariat of the Committee by **28 May 2018**. Please send the written response by soft copies to peter_chan@irc-bus.gov.hk and yt_to@irc-bus.gov.hk.

The information provided in the written responses will be considered by the Committee in reviewing the matters it is directed to consider under the terms of reference of the Committee and in drawing up its recommendations. If necessary, the Committee may invite your company to provide supplementary written responses and/or oral evidence. Please also be advised that all written responses (including any annexes, appendices and attachments contained therein) will be treated as public information and, at the discretion of the Committee, may be published on the Committee's website.

For enquiries, please contact the undersigned at 2867 2551 or Mr Justin TO of the Committee's Secretariat at 2867 4612.

Yours sincerely,



(CHAN Ping-fai, Peter)
Secretary, Independent Review Committee on
Hong Kong's Franchised Bus Service

Encl

**Independent Review Committee on Hong Kong's Franchised Bus Service
Terms of Reference**

From the point of view of safety, in the light of the fatal accident on 10 February and other recent serious incidents involving franchised buses in Hong Kong:

- (a) to examine the operation and management of bus franchises under the current legislative, franchise and other contractual requirements;
- (b) to examine the present regulatory and monitoring system for franchised buses; and
- (c) in relation to the above, to make recommendations to the Chief Executive on safety-related measures with a view to sustaining a safe and reliable franchised bus service in Hong Kong.

Note:

Issues relating to the causes and liability of persons involved in the fatal accident on 10 February 2018 will be investigated by the Police and fall outside the Committee's terms of reference.

1. The Committee has noted from your website that in a press release, dated 13 January 2012, (attached at **Appendix I**) NEC announced that on that date it had won:

“...the contract to deploy the Integrated Automatic Bus Stop Announcement (“ABSA”) and Data Logger (“DL”) system to 702 buses of New World First Bus Services Limited (“NWFB”) and 172 buses of Citybus Limited (“Citybus”) after its successful implementation of the same system across 760 buses of Citybus, the only large-scale deployment of GPS and ABSA system in Hong Kong.”

2. The announcement went on to state:

“The BSA & DL system combines the Global Positioning System (“GPS”), bus odometer signal and proprietary snap-on-route technology to overcome the “ghost” GPS signal caused by the unique environment of narrow streets and skyscrapers in Hong Kong.”

3. In written submissions provided to the Committee, dated 18 May 2018, (attached as **Appendix II**) having reminded the Committee that the Transport Department in Hong Kong had issued “the minimum requirements for electronic data recording device (black-boxes)” in October 2003, Citybus (“CTB”) and NWFB asserted that:

“In 2010, our Companies took the initiative to upgrade the black boxes to an integrated system with automatic bus stop announcement capability. The black-boxes record second-by-second data of:

- date & time;
- vehicle speed;
- foot brake status;
- door open status;
- bell push status; and
- bus position (latitude and longitude of the bus).

The whole fleet of CTB (F1) was equipped with this integrated system in June 2011. The whole fleet of CTB (F2) and NWFB was equipped with the same integrated system at the end of 2012.”

(Note: “F1” and “F2” above refer to the two bus franchises operated by CTB.)

4. Please confirm, if it is the case, that NEC supplied the equipment described in the CTB and NWBF written submissions. If so, please describe the component parts of that equipment, explaining how they interface in order to produce the results described.

5. Of the problem described in the NEC announcement of “ghost” GPS signals caused by the unique environment of narrow streets and skyscrapers in Hong Kong, please explain what is meant by “ghost” GPS signals and please give details of the extent of the problems and how it is that they were/are overcome by combining GPS, bus odometer signal and proprietary snap-on-route technology. What was/is the accuracy of the resulting data as to the latitude and longitude of a bus at any given time and place?

6. In the intervening period, since the installation of the systems on the bus fleets of CTB and NWFB, have technological advances provided alternative/additional ways of dealing with the problem of “ghost” GPS signals? If so, what are those advances and do you know whether or not they have been deployed in Hong Kong or elsewhere? If so, provide brief details of the utilisation of that technology.

7. The NEC announcement also stated that:
 “The control unit also logs the position and speed of the bus throughout the day. The data will be uploaded to server via Wi-Fi when the buses returned to bus depot.”

8. Please confirm, if it is the case, that the existing system installed by NEC on the buses of CTB and NWFB does not provide real-time information of the performance of the bus either to the bus driver and/or to the Control Centres of CTB and NWFB.

9. In the written submissions of CTB and NWFB, it is stated that:

“The prospective update to black-boxes with real-time capability was initiated by our companies and will be implemented by the third quarter of 2018.

The real-time black-box system will emit an instant audio warning (i.e. a beeping sound) automatically through the black-box control panel in the driver cab to alert the bus captain whenever an overspeed event occurs.”

10. The Committee has also noted another press release on the website of NEC, dated 5 August 2014, (attached as **Appendix III**) in which it was asserted that NEC would be implementing a telematics system for SMRT Corporation, Singapore, in respect of which it was asserted:

“NEC Asia Pacific had recently implemented Singapore’s first telematics system consisting of eco-drive sensors that monitor and analyse driving behaviour. The sensor indicators will light up when a bus driver speeds for a

prolonged period, accelerates or decelerates quickly, or changes lane abruptly, and provide visual cues for bus drivers to adjust their driving speed. The bus performance data is transmitted from each bus to a real-time centralised tracking software solution monitored at the control station via Global Positioning System (GPS). The telematics system will be installed on SMRT's fleet of 1,200 buses.

As part of the collaboration, NEC Asia Pacific will be implementing business analytics which leveraged on Big Data technologies to identify high-risk driving behaviours, through analysing data collected from the driver profiles, driving behaviour, historical route-related information, as well as others.”

11. Please describe how, in such a system, data is transmitted from a bus to “a real-time centralised tracking software solution monitored at the control station” via GPS. Does the data include speed, acceleration and deceleration? Can aberrant driver behaviour in those areas be detected automatically in real-time by the system? If so, does that permit the control station to communicate in real-time, automatically or by human intervention, the fact of aberrant driving behaviour immediately to the driver? Is NEC aware of such use of a telematics system for buses or for other heavy vehicles in Hong Kong or other overseas jurisdictions? If so, please describe briefly where, how and by whom it is used.

12. Is the current system installed on CTB and NWFB buses capable of measuring in real-time the tilting angle of a bus (or other parameters that can be used to determine in real-time the risk of a bus overturning)?

- End -



Empowered by Innovation



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For Immediate Release

**NEC Won the Contract of the
Integrated Automatic Bus Stop Announcement and Data Logger System by
New World First Bus Services Limited and Citybus Limited
~ Improving Transportation Efficiency and Passenger Satisfaction ~**

【Hong Kong, 13th January, 2012】 – NEC Hong Kong Limited (“NECHK”) is proud to announce today that it has won the contract to deploy the Integrated Automatic Bus Stop Announcement (“ABSA”) and Data Logger (“DL”) System to 702 buses of New World First Bus Services Limited (“NWFB”) and 172 buses of Citybus Limited (“Citybus”) after its successful implementation of the same system across 760 buses of Citybus, the only large scale deployment of GPS and ABSA system in Hong Kong.

NECHK, being a leading company in providing information and communications technology to public and private sector, has been promoting Fleet Management Solution in Hong Kong SAR and Macau SAR since 2007, in which NECHK has becoming a key service provider in the transportation industry.

The BSA & DL System combines the Global Positioning System (“GPS”), bus odometer signal and proprietary snap-on-route technology to overcome the “ghost” GPS signal caused by the unique environment of narrow streets and skyscrapers in Hong Kong.

Each bus will be equipped with LED display panel(s), a control unit and a handset for interfacing with driver. Bus captain is only required to input route information once at starting point, thereafter the control unit will perform ABSA automatically without further manual operations. The automatic process takes the burden off the bus captains as well as provides more location-based announcements.

The ABSA adopts bi-literacy (Chinese and English) in LED display panel and Tri-lingual (Cantonese, English and Putonghua) in passenger announcement system. When the bus is approaching to a bus stop, a location-based “this stop” announcement will show the bus stop name. When the bus is leaving the bus stop, the bus stop name of next stop will be broadcasted automatically.

The control unit also logs the position and speed of the bus throughout the day. The data will be uploaded to server via Wi-Fi when the bus is returned to bus depot. Such data could be replayed on a digital map to visualize historical bus movements. The BSA content and software update can also be downloaded to the control unit via Wi-Fi.

Mr. Brian Foo, General Manager, Government & Public Solutions Division of NECHK claimed, "Citybus and NWFB have an innovative vision to deploy modern ABSA & DL on its fleet, NECHK has the best Fleet Management solution in town that can be customized to suit Citybus and NWFB's requirements. We value the opportunity offered by Citybus and NWFB to deploy the solutions to its whole fleet. With our expertise in system integration, project management and maintenance support, we believe we can provide high quality service to Citybus and NWFB, and also to set a trend to the public transport operators in the region."

For enquiry, please call 2795-5333 or www.nec.com.hk

About NEC Hong Kong Limited

NEC Hong Kong Limited has a long and eventful history in Hong Kong since its establishment in 1984 and has been expanding its activities rapidly to meet the growing customer demand in Hong Kong, Macau and Mainland China. Dedicated to information and communication technologies, NEC provides advanced display & visual products, server & storage and telecommunication devices. NEC also plays a leading role in business solutions for security & border control, unified communication and IT platform, as well as services of IT consulting, networking and outsourcing. With a full range of technical experts and resources, we achieve professional customization in response to the dynamic needs of customers in various industries. With our extensive products and services, we continuously develop beneficial values for customers globally and become the one-stop answer for innovative technological excellence.

For more information, please visit www.nec.com.hk.



新創建集團成員 Members of NWS Holdings

- ~~ii) providing refresher training, which contents also include customer service skill and EO management, to all in-service bus captains;~~
- c) Starting from 1 June 2018, to improve monitoring of rest time of part-time bus captains before commencing driving duties, we will mandatorily require all part-time bus captains, including those in-service and new recruits, to declare details of the working hours and working days pattern of their principal employment. In addition, all in-service part-time bus captains will be required to make the same mandatory declaration on an annual basis;
- d) After the completion of the upgrade of black-boxes with real-time capability in the third quarter of 2018, bus captains will receive immediate alerts when the vehicle speed exceeds the prescribed limit;
- e) We have commenced a study to explore the feasibility and effectiveness of conducting psychological assessment of bus captain job applicants; and
- f) We will continue to explore and, if feasible, to equip our buses with new technological aids to enhance driving safety.

~~As we strive to provide better bus services to the public, we continue to welcome any recommendations from the Committee.~~

With regard to the information requested in your letter, our submissions are set out below:

1. Introduction of black-boxes to our buses (paragraphs 1 and 2 of your letter)

The Transport Department (“TD”) issued the minimum requirements for electronic data recording device (black-boxes) in October 2003 (Annex 1). The TD required that buses first registered after 1 July 2004 (“Effective Date”) should be installed with electronic data recording devices in compliance with the stated technical specification.

Subsequent to the Effective Date, our first batch of new buses was registered in 2007. The black-boxes installed on these buses fulfilled the TD’s requirements for the stated technical specification.

In 2010, our Companies took the initiative to upgrade the black-boxes to an integrated system with automatic bus stop announcement capability. The black-boxes record second-by-second data of:

- date & time;
- vehicle speed;
- foot brake status;
- door open status;





新創建集團成員 Members of NWS Holdings

- bell push status; and
- bus position (latitude and longitude of the bus).

The whole fleet of CTB (F1) was equipped with this integrated system in June 2011. The whole fleet of CTB (F2) and NWFB were equipped with the same integrated system at the end of 2012.

~~2. Monitoring of over speed by black boxes (paragraphs 3 to 5 of your letter)~~

a) Criteria for identifying road sections for speed detection

25 road sections with a speed limit of 50 km/hr were identified by our Companies for speed detection. These road sections have the following characteristics:

- i) continuous downward slope of significant length;
- ii) sharp road bends; or
- iii) serious or frequent traffic accidents have occurred in the past at these road sections.

Among these 25 road sections, 11 road sections were identified for monitoring in June 2013, 3 additional road sections were identified for monitoring in September 2014, and 11 road sections were further identified for monitoring in March 2018.

Other than those road sections with a speed limit of 70 km/hr or above, all the roads in Hong Kong have a speed limit of 50 km/hr.

We do not have the data to compile the percentage of roads with a speed limit of 50 km/hr on which buses of CTB and NWFB are driven as constituted by the 25 monitored road sections

b) Over speed exception reports

The criteria for generating over speed events are set in the software of the black-boxes. For those 25 monitored road sections, an over speed event will be generated when the vehicle speed exceeds 55 km/hr for more than 10 consecutive seconds. For road sections with a speed limit of 70 km/hr or above, an over speed event will be generated when the vehicle speed exceeds 75 km/hr for more than 10 consecutive seconds.

Black-box data and over speed event records are uploaded to the Companies' computer server when buses return to depots for refuelling every night.

~~Should there be over speed events, an over speed event report will be generated by the~~

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NEC to implement solutions for SMRT Corporation to enhance bus service excellence

First telematics system in Singapore to monitor bus drivers' driving behavior

*** For immediate use August 5, 2014

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Singapore & Tokyo, 5 August 2014 - NEC Asia Pacific, a leading infocomm technology provider and wholly owned subsidiary of NEC Corporation, will be implementing solutions for SMRT Corporation, a Singapore public transport service provider, that will enhance bus service excellence through improving bus drivers' driving behaviour and bus operations.

NEC Asia Pacific had recently implemented Singapore's first telematics system consisting of eco-drive sensors that monitor and analyze driving behaviour. The sensor indicators will light up when a bus driver speeds for a prolonged period, accelerates or decelerates quickly, or changes lane abruptly, and provide visual cues for bus drivers to adjust their driving speed. The bus performance data is transmitted from each bus to a real-time centralised tracking software solution monitored at the control station via Global Positioning System (GPS). The telematics system will be installed on SMRT's fleet of 1,200 buses.

As part of the collaboration, NEC Asia Pacific will be implementing business analytics which leverage on Big Data technologies to identify high-risk driving behaviours, through analysing data collected from the driver profiles, driving behaviour, historical route-related information, as well as others. This will enable SMRT to align risk management and performance monitoring strategies to enhance passenger safety and mitigate risks.

In addition, NEC Asia Pacific will also be implementing smart fleet solutions to manage operations and monitor the buses' exact locations. Coupled with GPS, proprietary dead reckoning algorithms will also be implemented as part of the solution to provide bus locations in real-time for a finer level of control. With this solution, the distribution of buses can be monitored with greater real-time accuracy by route coordinators on an on-screen map, to help in quick decision-making.

As part of the smart fleet solutions, the self-equalising headway engine solution will also be implemented. It will recognise when bunching or gapping of buses occur, and will automatically suggest options that can help maintain regular spacing between buses to reduce passenger waiting time.

"NEC Asia Pacific is excited to be the technology partner for SMRT's telematics and fleet management system to help deliver a better commuting experience to the public. The telematics project marks the first public transportation programme launched in Singapore targeted to enhance driving behaviour of bus drivers. We are glad to leverage on our expertise in implementing innovative smart city and public infrastructure solutions to deliver state-of-the-art transport solutions that will benefit public commuters," said Mr Lim Kok Quee, Managing Director, NEC Asia Pacific.



Telematics system provides visual cues to bus drivers when speeding, braking, accelerating or when driving abruptly, to encourage safer and more sustainable driving for an enhanced commuter experience.

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Independent Review Committee on
Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
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25 May 2018

Ms Elsa WONG
Managing Director
NEC Hong Kong Limited
25/F, The Metropolis Tower
10 Metropolis Drive
Hungohm, Kowloon
(Email: solutions@nechk.nec.com.hk)

BY EMAIL & BY POST

Dear Ms WONG,

**Request to provide written responses to
Independent Review Committee on Hong Kong's Franchised Bus Service**

Further to our letter of 21 May 2018, this Committee would like to make further enquiries on the matters as set out in the **Annex**.

I should be grateful if the response of your company could reach the Secretariat of the Committee by **1 June 2018**. Please send the written response by soft copies to peter_chan@irc-bus.gov.hk and yt_to@irc-bus.gov.hk.

The information provided in the written responses will be considered by the Committee in reviewing the matters it is directed to consider under the terms of reference of the Committee and in drawing up its recommendations. If necessary, the Committee may invite your company to provide supplementary written responses and/or oral evidence. Please also be advised that all written responses (including any annexes, appendices and attachments contained therein) will be treated as public information and, at the discretion of the Committee, may be published on the Committee's website.

For enquiries, please contact the undersigned at 2867 2551 or Mr Justin TO of the Committee's Secretariat at 2867 4612.

Yours sincerely,

(CHAN Ping-fai, Peter)

Secretary, Independent Review Committee on
Hong Kong's Franchised Bus Service

Encl

In the written submissions of CTB and NWFB, dated 18 May 2018, (attached as **Appendix**) it is stated that:

“The prospective update to black-boxes with real-time capability was initiated by our Companies and will be implemented by the third quarter of 2018.

The real-time black box system will emit an instant audio warning (i.e. a beeping sound) automatically through the black-box control panel in the driver cab to alert the bus captain whenever an over speed event occurs.”

- (i) Please confirm, if it is the case, that NEC is supplying the equipment to update the system of “black boxes” installed on the buses of CTB and NWFB? If so, does the prospective updated equipment and system include an audio warning given to the driver in the driver’s cab automatically through the black-box in real time whenever the vehicle exceeds a preset speed limit?
- (ii) Does the updated equipment and system allow for the real-time transmission of all the data obtained in the “black-box” to be transmitted to the central control centre of the bus companies? If so, how is that done/to be done? Is the equipment and system capable of giving an automatic, real-time alert at the central control centre, for example triggered by excess speed, braking or acceleration? Is the equipment and system capable of communicating real-time such an alert/warning from the central control centre to the driver in the bus? If so, how can that be done? Is NEC aware of such use of a telematics system for buses or for other heavy vehicles in other overseas jurisdictions? If so, please describe briefly where, how and by whom it is used.



新創建集團成員 Members of NWS Holdings

d) Report to the TD

In the Forward Planning Programme submitted annually, we informed the TD of the measures implemented to enhance safety, and described amongst other things, the generation of over speed reports.

From January 2018 onward, the TD required us to submit a Monthly Report on Monitoring Measures Relating to Bus Safety. Over speed statistics and actions taken against bus captains concerned are set out in Part C of the Monthly Report (Annex 4).

e) Handbooks for bus captains

Earlier versions of the Handbooks for Bus Captains are attached as follows:

- i) CTB 車務員工手冊 issued in September 2000 (Annex 5.1)
- ii) NWFB 員工手冊 issued in January 2003 (Annex 5.2)
- iii) CTB and NWFB 車長手冊 issued in November 2016 (Annex 5.3)
- iv) CTB and NWFB 車長手冊 issued in July 2017 (Annex 5.4)

3. Random checking of data recorded in black-boxes (paragraphs 6 and 7 of your letter)

“Records of random check on the operational data recorded in black boxes and the corresponding follow-up actions” is the description used by the TD in March 2018 when requiring us to submit a list of reports. It refers to the following:

a) “No. of Routine Checks on Black Box Data Conducted”

This is the checking of black-box data for over speed at the 25 monitored road sections with speed limit of 50 km/hr and all road sections with speed limit of 70 km/hr or above; and

b) “No. of Ad-hoc Checks on Black Box Data Conducted”

This is the checking of black-box data for the investigation of traffic accidents and customer complaints relating to driving performance.

4. Black-boxes with real-time capability (paragraphs 8 and 9 of your letter)

The prospective update to black-boxes with real-time capability was initiated by our Companies and will be implemented by the third quarter of 2018.

The real-time black box system will emit an instant audio warning (i.e. a beeping sound) automatically through the black-box control panel in the driver cab to alert the bus captain

whenever an over speed event occurs.

5. Part-time bus captains (paragraphs 10 to 14 of your letter)

a) Criteria to determine a bus captain as part-time

A bus captain applicant may apply for either a full-time or a part-time job. Full-time bus captains have to work on a daily basis, other than leave days. They are required to perform the Companies' assigned duties on specified date, time, place and routes. Subject to the Companies' operational need, a part-time bus captain may elect to work when he is available.

b) Rest time of part-time bus captains and information required from them

In applying for a position as a part-time bus captain at the Companies, candidates are required to provide details of their principal employment. We already have the practice of requesting for information on the working hours for the applicant's principal employment, but the provision of such information is not mandatory. We do not specifically require part-time bus captains to declare if they have adequate rest time before commencing their duties.

Part-time bus captains are also requested to provide the same information regarding their principal employment on an annual basis. These records on working hours for part-time bus captains have not been requested by the TD.

From 1 June 2018, we will require all part-time bus captains, including those in-service and new recruits, to provide working hour information of their principal employment on a mandatory basis. The request for information will cover details of the working hours and pattern of workings of their principal employment. Thereafter, all in-service part-time bus captains will be required to make the same mandatory declaration on an annual basis.

Sample copy of 職位申請表 to be filled in upon job application is enclosed as Annex 6. Sample copy of the annual declaration 僱員行為及紀律守則 / 外間工作申報書 is enclosed as Annex 7.

6. Bus captain training (paragraphs 15 to 18 of your letter)

a) There are records of bus routes on which newly recruited part-time bus captains have been trained on, during the 2-day driving training received upon joining the Companies. A sample copy of this training record is attached as Annex 8.

b) Allocators or Depot Inspectors (each individually, "Allocation Staff") are responsible for assigning driving duties to both full-time and part-time bus captains.

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Fw: Independent Review Committee on Hong Kong 's Franchised Bus Service (Request for Information)

From: Grace SU <grace_su@nechk.nec.com.hk>
To: "peter_chan@irc-bus.gov.hk" <peter_chan@irc-bus.gov.hk>,
Cc: Elsa WONG <elsa_wong@nechk.nec.com.hk>, Janet CHIONG <janet_chiong@nechk.nec.com.hk>
Date: 09/07/2018 09:48
Subject: RE: Independent Review Committee on Hong Kong's Franchised Bus Service (Request for Information)

Dear Sirs,

RE: Request to provide written responses to Independent Review Committee on Hong Kong's Franchised Bus Service

We refer to your letters for the subject matter dated 21 May 2018 and 25 May 2018.

Please kindly note that the technical information in relation to the fleet management system / solution is treated as proprietary & confidential information of our company. Considering that any response to the Committee will be treated as public information and may be published on the Committee's website, we are afraid that we could not provide further information to you except those which have been published in our website.

Thank you for your attention and kind understanding. Should you have any further questions, please feel free to contact me.

Thanks & Regards,

Grace Su
Business Support Office
NEC Hong Kong Limited
Tel: (852) 2733 5261
Email: grace_su@nechk.nec.com.hk

香港專營巴士服務
獨立檢討委員會

香港金鐘道 66 號
金鐘道政府合署 21 樓

本函檔號 Our Ref.: CSO/IRC-BUS/CR/7-45/16
來函檔號 Your Ref.:



**Independent Review Committee on
Hong Kong's Franchised Bus Service**

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
傳真號碼 Fax No.: (852) 3104 0254

24 July 2018

NEC Hong Kong Limited
25/F, The Metropolis Tower
10 Metropolis Drive
Hungghom, Kowloon
(Attn: Ms Grace SU, Business Support Office)
(Email: grace_su@nechk.nec.com.hk)

BY EMAIL & BY POST

Dear Ms SU,

**Request to provide written responses to
Independent Review Committee on Hong Kong's Franchised Bus Service**

Thank you for your email dated 9 July 2018, in reply to our letters dated 21 and 25 May 2018.

In your reply, you asserted:

“Please kindly note that the technical information in relation to the fleet management system / solution is treated as proprietary & confidential information of our company. Considering that any response to the Committee will be treated as public information and may be published on the Committee’s website, we are afraid that we could not provide further information to you except those which have been published in our website.”

Amongst the information that the Committee sought from you was confirmation that NEC had supplied the equipment that, in written submissions, Citybus (“CTB”) and New World First Bus (“NWFB”) had informed the Committee had been fitted, as upgrades to black boxes, to its franchised buses in the period 2010-2012.

With respect, it is difficult to understand what information sought in that particular request might properly be regarded as “proprietary & confidential” information. In any event, in the period of more than 6 weeks which you took to reply to our letters, the Committee received oral evidence from representatives of CTB and NWFB in which they confirmed that you were the supplier of the equipment. [Transcript Day 4; 30 May 2018, page 11.]

In their written submissions to the Committee, CTB and NWFB said that they had informed the Transport Department in their five-year forward planning programme that they intended to generate “overspeed reports” and that: [CTB NWFB-1; page 58, paragraph 2 (d) and paragraph 4.]

“The prospective update to black boxes with real-time capability was initiated by our companies and will be implemented by the third quarter of 2018.

The real-time blackbox system will emit an instant audio warning (i.e. a beeping sound) automatically through the letterbox control panel in the driver cab to alert the bus captain whenever an overspeed event occurs.”

In their evidence, the representatives of CTB and NWFB went on to describe the use contemplated by the companies of the upgraded equipment. The Committee was told that the driver cab alert was limited to an audio/visual over speeding report and that an “exception report” would only be generated if the threshold of 75 kilometres per hour for a continuous period of 10 seconds or the threshold is 55 kilometres per hour for a continuous period of 10 seconds was met in respect of 25 stipulated sections of road. [Transcript Day 4; 30 May 2018, pages 27-35.]

The purpose of the questions asked of NEC in paragraphs 9-11 of our letter dated 21 May and our letter dated 25 May 2018 was to be informed of the capabilities of the upgraded equipment provided by NEC to CTB and NWFB.

For your information, we have sought and have been supplied similar information through written submissions and evidence (by video link from the Czech Republic) from the representatives of ZF Friedrichshafen and Openmatics who supplied similar equipment to Kowloon Motorbus (1933) Company Limited (“KMB”), Long Win Bus Company Limited (“LWB”) and New Lantao Bus Company Limited (“NLB”). [BM-1, pages 48-72] and [Transcript Day 6; 14 July 2018, pages 135-177.]

In their closing submissions, accurately representing their cooperation with the Committee, Mr Frederick CK HUI, the legal representative of ZF Friedrichshafen and Openmatics said: [Transcript Day 6; 14 July 2018, pages 176.]

“On behalf of ZF I wish to thank this Committee for its invitation to assist. ZF will continue to try their best to assist this Committee on a voluntary basis. ZF is determined and committed to make a contribution to the improvement of road safety in Hong Kong and around the world.

We hope the information provided by ZF, and Mr KULIŠ, is helpful to this Committee, and for further information and documents, we will continue to work with the Secretariat. Thank you.”

In those circumstances, having regard to the fact that the Committee is charged with making recommendations to the Chief Executive of Hong Kong to enhance the safety of the operation of franchised buses in Hong Kong which is in the interest of the community at large, we would urge you to reconsider your reply to our earlier requests for information to assist in that task. We look forward to receiving your assistance.

For enquiries, please contact the undersigned at 2867 2551 or Mr Justin TO of the Committee's Secretariat at 2867 4612.

Yours sincerely,



(CHAN Ping-fai, Peter)
Secretary, Independent Review Committee on
Hong Kong's Franchised Bus Service

26 October 2018

Independent Review Committee on
Hong Kong's Franchised Bus Service
21/F, Queensway Government Offices,
66 Queensway,
Hong Kong
(Attn: Mr. CHAN Ping-fai, Peter)

Dear Mr. CHAN,

**Request to provide written responses to
Independent Review Committee on Hong Kong's Franchised Bus Service**

Thank you for your letters dated 21 May 2018 ("Letter 1"), 25 May 2018 ("Letter 2") and 9 July 2018 ("Letter 3") for the captioned matters. We are pleased to provide the following information for your perusal.

In response to your question in paragraph 4 of Letter 1, please note that NEC supplied equipment to CTB & NWFB which consists of the following key parts:

- IVU (In-vehicle unit), capable of communication with backend and other on-board peripherals, location acquisition, signal processing.
- DCP (Driver control panel), used by driver to select route and other functions like communication with backend control center.
- Central system (Bus depot computer for data exchange and Backend system with UI), to be operated by CTB/NWFB back office personnel

In response to your question in paragraph 5 of Letter 1, please note that "ghost" GPS signal is caused by the fact that GPS signal might not travel directly from satellite but be also deflected, e.g. from a glass-clad buildings causing multipath (signal travelling more than straight line). That causes wrong position reading. Actually, such problem is common in narrow streets (i.e. up to 50% of time in an area like Wan Chai and Nathan Road, etc.). NEC technologies essentially resolve these problems in a smart way by correcting the GPS using odometer data and map-matching where buses are travelled.

In response to your question in paragraph 6 of Letter 1, you may find that GPS chipsets improve constantly, but even with latest generation used, “ghost” problem will still be present. Alternative technologies which alone may not resolve problems completely are dead-reckoning and various “beacon” technologies. The latter are particularly expensive to deploy and maintain. So, in HK environment and according to NEC’s understanding from discussion with public transportation stakeholders in HK, we are correcting / optimizing the raw and incorrect GPS location by means of customized technology and deploy the same in public transportation industry. The preciseness of GPS location is the essential element for subsequent calculation of ETA and Automatic Bus-stop announcement system together with other bus related application.

In response to your question in paragraph 8 of Letter 1, please note that data upload “to server via WiFi when buses returned to bus depot” is a dependent of system setting and the capability of IVU as well. In the latest CTB & NWFB system, IVUs are updated version and current setting enable a full “real-time system” via 3G communication.

In response to your question in paragraph 11 of Letter 1, please note that the said system is deployed on 1,400 SMRT buses and data is transmitted real-time via 3G network (GPS system is GNSS system and not communication system). Events are detected and transmitted to the backend in the real-time. Drivers receive notifications with some delay (as requested by the customer) in order not to distract them (or cause additional passenger concern) with audible and visible signal. NEC has deployed this kind of real-time alert system in other global project but NEC is unsure whether other system providers has provided the same to other public transport operators or not. The real-time alerts that NEC can provide are list in the following:

- speed
- harsh braking
- harsh acceleration
- sharp-cornering
- swaying

Since the hardware in Singapore and HK are not exactly the same, so in HK case, sharp-cornering and swaying feature is not yet commercially available. In order to bring these features to be workable in production network in HK environment, software upgrade is considered to be mandatory.

In response to your question in paragraph 12 of Letter 1, please note that the currently deployed system includes 3D accelerometer with self-orientation function. It can be used as indicator of tilt and this function has been implemented in SMRT project with event being called “sharp-cornering”. In the case of HK, sharp-cornering feature is not yet commercially available. In order to bring this feature to be workable in production network in HK environment, software upgrade is considered to be necessary.

In response to your question in Letter 2, it is confirmed that NEC supplies “black boxes” to CTB and NWFB which includes audio warning when speeding and such feature is now available in CTB & NWFB after recent system upgrade. The transmission of “black box” data from IVU to backend server is subject to setting. (i.e. either by WiFi when the buses arriving depot or by commercial wireless network which is on real-time basic). Examples of such uses are NEC customer in Singapore (SMRT) and other customers in India etc.

We hope the above information clarifies your queries and is helpful to the Committee. Taking this opportunity, we thank the Committee for its invitation to assist on this matter and your patience for our response. NEC is committed to continuously developing and implementing cutting-edge technologies and solutions for improvement of road safety in Hong Kong and around the world. Should you need any further information, please feel free to contact us.

Yours sincerely
For and on behalf of
NEC Hong Kong Limited


Elsa Wong
Managing Director

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香港專營巴士服務
獨立檢討委員會

香港金鐘道 66 號
金鐘道政府合署 21 樓

本函檔號 Our Ref.: CSO/IRC-BUS/CR/7-45/16
來函檔號 Your Ref.:



Independent Review Committee on
Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
傳真號碼 Fax No.: (852) 3104 0254

1 June 2018

LKW Parts and Services Ltd.
Room 306, 3/F, Fook Yip Building
Nos. 53-57 Kwai Fung Crescent
Kwai Chung, New Territories
[email: Info@Lyodsssoft.com]

BY EMAIL & BY POST

Dear Sirs,

**Request to provide written responses
to the Independent Review Committee on Hong Kong's Franchised Bus Service**

The Chief Executive announced on 13 March 2018 that an Independent Review Committee on Hong Kong's Franchised Bus Service (the Committee) had been set up, following the occurrence of the fatal incident on Tai Po Road on 10 February 2018 and other recent serious incidents involving franchised buses in Hong Kong. From the point of view of safety, the Committee is required to examine the operational management of bus franchises and the related regulatory and monitoring system of franchise buses, so as to make recommendations to the Chief Executive of safety-related measures with a view to sustaining a safe and reliable franchised bus service. The terms of reference of the Committee are set out in the *Annex* of this letter.

The Committee commenced its work on 28 March 2018 and has written to various stipulated interested parties requesting that they provide the committee with written submissions and that they respond to issues and questions posed of them by the Committee.

One of the issues being examined by the Committee is the installation and use of information gathered by tachographs / black boxes in franchised buses. On this issue, the Committee has been informed by the Hong Kong Police Force that your company installed equipment in police vehicles under a pilot scheme which operated a system known by the acronym RIBAS, namely: "R-over revving"; "I-idling"; "H-harsh braking"; "A-harsh acceleration"; and "S-speeding". Of that system, the Hong Kong Police Force informed the Committee that "*Parameters are set for the various features, i.e. what is considered normal operating limits, and then whatever occurs outside the parameters is flagged automatically by the computer to a supervisor*". Furthermore, the Committee notes from your company's website that your clients include Kowloon Motor Bus, Citybus and Lantau Bus.

It is in those circumstances, as instructed by the Chairman of the Committee, the Honourable Mr Justice Michael Lunn, that I write to request your company to provide written responses to the Committee. Specifically, the Committee requests your company to:

- (i) describe how the system provided to the Hong Kong Police Force works and, in particular whether or not it provides a real-time alert to the supervisor, namely from the police vehicle to the supervisor at the time of the event. If so, please describe how that is done; and
- (ii) with regard to the bus companies of Kowloon Motor Bus, Citybus and Lantau Bus, if you have supplied and/or installed any of the following equipment, namely speed limiters, tachographs or telematic systems, to any of those companies, please provide the Committee with details of the supply and/or installation of that equipment, including when that was done and brief details of the capabilities of the systems, in particular whether or not it is capable of providing and/or did provide real-time data from the bus to a control centre of the franchised bus operator.

I should be grateful if the response of your company could reach the Secretariat of the Committee by **8 June 2018**. Please send the written response by soft copies to peter_chan@irc-bus.gov.hk and yt_to@irc-bus.gov.hk.

The information provided in the written responses will be considered by the Committee in reviewing the matters it is directed to consider under the terms of reference of the Committee and in drawing up its recommendations. If necessary, the Committee may invite your company to provide supplementary written responses and/or oral evidence. Please also be advised that all written responses (including any annexes, appendices and attachments contained therein) will be treated as public information and, at the discretion of the Committee, may be published on the Committee's website.

For enquiries, please contact the undersigned at 2867 2551 or Mr Justin TO of the Committee's Secretariat at 2867 4612.

Yours sincerely,



(CHAN Ping-fai, Peter)

Secretary, Independent Review Committee on
Hong Kong's Franchised Bus Service

Encl

**Independent Review Committee on Hong Kong's Franchised Bus Service
Terms of Reference**

From the point of view of safety, in the light of the fatal accident on 10 February and other recent serious incidents involving franchised buses in Hong Kong:

- (a) to examine the operation and management of bus franchises under the current legislative, franchise and other contractual requirements;
- (b) to examine the present regulatory and monitoring system for franchised buses; and
- (c) in relation to the above, to make recommendations to the Chief Executive on safety-related measures with a view to sustaining a safe and reliable franchised bus service in Hong Kong.

Note:

Issues relating to the causes and liability of persons involved in the fatal accident on 10 February 2018 will be investigated by the Police and fall outside the Committee's terms of reference.

Urgent Return receipt Sign Encrypt Mark Subject Restricted Expand personal&public groups



Re: Independent Review Committee on Hong Kong 's Franchised Bus Service (Request for Information)

08.06.2018 11:41

From: "info@lyodssoft.com" <info@lyodssoft.com>
To: yt_to@irc-bus.gov.hk,
Cc: peter_chan@irc-bus.gov.hk, lawrence_chung@irc-bus.gov.hk

Dear Justin,

Thank you for your email.

LKW started telematics service since 1995, as you might have learn from our website our existing and previous clients include government department, commercial fleet and special vehicle.

Regarding your queries on the HKPF and bus companies project, kindly find the detail below:

For HKPF project, we installed black boxes - communications-enabled devices, which can store, send and receive information that integration of Global Positioning System ([GPS](#)) technology and computers enables telematics to mark the location, speed., etc and communicate with the police vehicles.

Besides, they have installed the RABIS system for driver real time alert with flashing and beeping when speeding.
In this pilot project, they did not activate the realtime alert function..

For the bus operators, we deployed the telematics systems with the monitoring on speeding, acceleration, etc. One of the operator deploy realtime alert function to their supervisor with email alert.

As per our understanding, they might stop using the system since 2013 or earlier.

For your information, the system can provide email, SMS and other proactive alerts to supervisor / control center.

Should you have any further queries, please feel free to contact us for more details.

Thanks and regards,
Sunny Chik

LKW PARTS & SERVICES LTD

----- 轉寄的訊息 -----

寄件者： <yt_to@irc-bus.gov.hk>

日期：2018年6月1日 週五，下午6:58

寄件者：Independent Review Committee on Hong Kong's Franchised Bus Service (Request for Information)

收件者： <Info@lyodssoft.com>

副本： <peter_chan@irc-bus.gov.hk>, <lawrence_chung@irc-bus.gov.hk>

Dear sirs,

I am writing on behalf of the Independent Review Committee on Hong Kong's Franchised Bus Service ("the Committee"), the Review Committee set up by the Government after the bus crash on Tai Po Road on 10 February 2018.

The Committee is tasked with examining the operation and management of bus franchises in Hong Kong as well as the related regulation and monitoring regime with a view to making safety-related recommendations and has commenced its work in March 2018. After gathering some information from relevant government departments and the franchised bus companies, one of the issues that the Committee is focusing on is the installation of and use of information gathered by black boxes on franchised buses in Hong Kong.

We note from the Hong Kong Police Force that your company has installed equipment in police vehicles under a pilot scheme which operated a system known by the acronym RIBAS for the monitoring of driving behaviour, as well as from your company's website that your clients include Kowloon Motor Bus, Citybus and Lantau Bus. The Chairman of the Committee, the Hon. Mr Justice Michael Lunn, has therefore asked the Secretariat of the Committee to write to you inviting your company to provide some information regarding the systems installed in the vehicles of the Police and the buses of Kowloon Motor Bus, Citybus and Lantau Bus. We have attempted to set out the questions we have in mind in the attached letter.

May I thank you and your team in advance for helping the Committee with the questions. Please let me know if you need require any additional information or clarifications regarding the matters detailed in the letter. I can be reached at 2867 4612. Thank you.

Best regards,

Justin TO

for Secretary, Independent Review Committee on Hong Kong's Franchised Bus Service
The Government of the Hong Kong Special Administrative Region

香港專營巴士服務
獨立檢討委員會

香港金鐘道66號
金鐘道政府合署21樓

本函檔號 Our Ref.: CSO/IRC-BUS/CR/7-45/16
來函檔號 Your Ref.:



Independent Review Committee on
Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
傳真號碼 Fax No.: (852) 3104 0254

11 June 2018

LKW Parts and Services Ltd.
Room 306, 3/F, Fook Yip Building
Nos. 53-57 Kwai Fung Crescent
Kwai Chung, New Territories
(Attn: Mr Sunny CHIK)
[email: info@lyodsoft.com]

BY EMAIL & BY POST

Dear Mr Chik,

**Request to provide written responses
to the Independent Review Committee on Hong Kong's Franchised Bus Service**

Thank you for your email dated 8 June 2018, in which you responded to the Committee's enquiries in our letter of 1 June 2018.

In your reply, you state:

“For the bus operators, we deployed the telematics systems with the monitoring on speeding, acceleration, etc. One of the operator deploy real-time alert function to the supervisor with email alert.

As per our understanding, they might stop using the system since 2013 or earlier.

For your information, the system can provide email, SMS and other proactive alerts to supervisor/control center.”

It would assist the Committee if you would provide the following further information:

- (a) Please identify the franchised bus operators to which you supplied “... the telematics system with monitoring on speeding, acceleration, etc” and describe when that was done.
- (b) Please identify the franchised bus operator who deployed the “real-time alert function to the supervisor with email alert.” Were those alerts in respect of speeding only, or were other alerts communicated of the manner in which the bus was driven?

- (c) Please describe the basis on which you state that it is your understanding that the bus operator “might stop using the system since 2013 or earlier.”
- (d) Please identify the equipment/system which was supplied that had those capabilities, and describe by which means the email of the real-time alert was communicated to the supervisor.
- (e) Of your statement that the system can provide “other proactive alerts to supervisor/control center”, please describe the nature of and method by which those alerts can be communicated.

I should be grateful if the response of your company could reach the Secretariat of the Committee by **19 June 2018**. Please send the written response by soft copies to peter_chan@irc-bus.gov.hk and yt_to@irc-bus.gov.hk.

The information provided in the written responses will be considered by the Committee in reviewing the matters it is directed to consider under the terms of reference of the Committee and in drawing up its recommendations. If necessary, the Committee may invite your company to provide supplementary written responses and/or oral evidence. Please also be advised that all written responses (including any annexes, appendices and attachments contained therein) will be treated as public information and, at the discretion of the Committee, may be published on the Committee’s website.

For enquiries, please contact the undersigned at 2867 2551 or Mr Justin TO of the Committee’s Secretariat at 2867 4612.

Yours sincerely,



(CHAN Ping-fai, Peter)
Secretary, Independent Review Committee on
Hong Kong’s Franchised Bus Service

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Re: Independent Review Committee on Hong Kong 's Franchised Bus Service (Request for Information)

20.06.2018 10:18

From: "info@lyodssoft.com" <info@lyodssoft.com>
To: yt_to@irc-bus.gov.hk,
Cc: lawrence_chung@irc-bus.gov.hk, peter_chan@irc-bus.gov.hk

Dear Justin,

According to attached letter, please see below response.

- a. The franchised bus operators which we supplied are New Lantao Bus, City Bus and Kowloon Bus. They project was done (estimate) in the following date:
New Lantao Bus: Dec, 2016
City Bus: Year 2008
Kowloon Bus: Year 2011-2012
- b. New Lantao Bus deployed only the real-time speeding alert functions to the supervisor via email. For the rest of the driving manner such as acceleration, deceleration, idling, all of them deployed and collected non-real-time data for reporting purpose.
- c. All operators informed us they will stop the service at the time they decided to stop the services.
- d. We provide telematics turn key solution which have the capabilities to collect driving manner and send out real-time alerts to supervisor via mobile network thought email/sms/system screen pop up.
- e. The nature of the proactive alerts can be driver behavior related (such as speeding, acceleration, deceleration, idling) and vehicle management related (such as location tracking, Fuel management). The black box with the built-in mobile SIM, which installed in the bus will collect and transmit the real time data to control center/supervisor thought mobile network.

香港專營巴士服務
獨立檢討委員會

香港金鐘道 66 號
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Independent Review Committee on
Hong Kong's Franchised Bus Service

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
傳真號碼 Fax No.: (852) 3104 0254

25 May 2018

Ms Lilian LAI
Managing Director
ZF Services Hong Kong Ltd
2/F Technology Plaza
29-35 Sha Tsun Road
Tsuen Wan, New Territories
(Email: zfhk@zf.com)

BY EMAIL & BY POST

Dear Ms LAI,

**Request to provide written responses
to address the issues and questions set out in Annex III of this letter**

The Chief Executive announced on 13 March 2018 that an Independent Review Committee on Hong Kong's Franchised Bus Service (the Committee) had been set up, following the occurrence of the fatal incident on Tai Po Road on 10 February 2018 and other recent serious incidents involving franchised buses in Hong Kong. From the point of view of safety, the Committee is required to examine the operational management of bus franchises and the related regulatory and monitoring system of franchise buses, so as to make recommendations to the Chief Executive of safety-related measures with a view to sustaining a safe and reliable franchised bus service. The terms of reference of the Committee are set out in *Annex I* of this letter.

The Committee commenced its work on 28 March 2018 and has written to various stipulated interested parties requesting that they provide the committee with written submissions and that they respond to issues and questions posed of them by the Committee.

One of the issues being examined by the Committee is the installation and use of information gathered by tachograph's/black boxes in franchised buses. On this issue, the Committee notes from the website of your company that Asia, ZF Services and Openmatics is the supplier of the enhanced tachograph/telematics systems adopted by Kowloon Motor Bus Company (1933) Limited ("KMB") and Kwoon Chung Bus Holdings Limited ("Kwoon Chung"), of which New Lantau Bus Company (1973) Limited ("NLB") is a subsidiary company. [Website reports attached at *Annex II*.] It is in those circumstances, as instructed by the Chairman of the Committee, the Honourable Mr Justice Michael Lunn, that I write to request your company to provide written responses to address the issues and questions set out in *Annex III* of this letter, as well as to provide any comments that your company may wish to raise.

I should be grateful if the response of your company could reach the Secretariat of the Committee by **1 June 2018**. Please send the written response by soft copies to *peter_chan@irc-bus.gov.hk* and *yt_to@irc-bus.gov.hk*.

The information provided in the written responses will be considered by the Committee in reviewing the matters it is directed to consider under the terms of reference of the Committee and in drawing up its recommendations. If necessary, the Committee may invite your company to provide supplementary written responses and/or oral evidence. Please also be advised that all written responses (including any annexes, appendices and attachments contained therein) will be treated as public information and, at the discretion of the Committee, may be published on the Committee's website.

For enquiries, please contact the undersigned at 2867 2551 or Mr Justin TO of the Committee's Secretariat at 2867 4612.

Yours sincerely,



(CHAN Ping-fai, Peter)
Secretary, Independent Review Committee on
Hong Kong's Franchised Bus Service

Encl

**Independent Review Committee on Hong Kong's Franchised Bus Service
Terms of Reference**

From the point of view of safety, in the light of the fatal accident on 10 February and other recent serious incidents involving franchised buses in Hong Kong:

- (a) to examine the operation and management of bus franchises under the current legislative, franchise and other contractual requirements;
- (b) to examine the present regulatory and monitoring system for franchised buses; and
- (c) in relation to the above, to make recommendations to the Chief Executive on safety-related measures with a view to sustaining a safe and reliable franchised bus service in Hong Kong.

Note:

Issues relating to the causes and liability of persons involved in the fatal accident on 10 February 2018 will be investigated by the Police and fall outside the Committee's terms of reference.



ZF SERVICES is expanding its workshop service in China and increasingly supports independent workshops.

PHOTO: xixinxing/Fotolia

China currently place their trust in 4S stores which can be compared to authorized workshops. 4S stands for sales, spare parts, service, and survey. "However, independent workshops offering high-quality services at competitive prices are becoming increasingly popular," explains Markus Wittig. ZF plans to support these workshops with innovative one-stop shop solutions and services tailored to meet current demand. "We are not only expanding product development but also our service network," adds Markus Wittig. "We plan to have service partners in all provinces of China in three years' time, so that you will see us doubling our number of service partners and increasing our presence beyond the most populous cities."

New sales channels

Even the most customer-oriented product portfolio can fail if the sales channels do not reach the target group. ZF Services knows: The Chinese use online stores four times more frequently than Europeans. At many dealers, ZF Services products are therefore already listed online. At the beginning of 2016, a ZF online store will be launched on Tmall, one of China's most popular platforms. In order to even better satisfy the needs of the Internet-savvy Chinese customers, ZF Services

China has already been very active on China's most successful social media channel WeChat since October 2014. "We aim to reach all groups of society, from the youngest to the oldest. It is, after all, our objective to make ZF Services the leading Chinese After Sales provider – and this not 'only' for customers aged over 30," underlines Wittig. ■

Telematics solutions in demand

Openmatics in Asia

In Asia, ZF Services is also successful with its telematics solutions. Recently, Openmatics won its first customer, the Kowloon Motor Bus Company (KMB). KMB uses Openmatics in 4 000 public buses in Hong Kong. Among other things, a system to monitor vehicle handling by the driver and an interface to the bus stop information system were integrated into the system.

For more information of the in-depth interview with Markus Wittig go to:

► www.zf.com/magazine



[Telematics](#) ▾[Asset Tracking](#) ▾[Entertainment](#)[Diagnostics](#) ▾[Engineering](#)[Share this page](#)[Success Stories](#) ...[Kwoon Chung](#)

We want to provide smart bus service

KWOON CHUNG about Telematics for buses

We mainly provide bus services in Hong Kong but we also are currently operating 23 franchised bus routes in Lantau Island. In total, we operate approximately 1,200 vehicles. We wanted "black box functionality" so we would know what happened during an accident. We needed precise positioning suitable for ETA (estimated time arrival). And we also wanted to tackle bad driving behaviour.

We got a tailored app for data collection to substitute the black box. Now we receive telematics and also diagnostics data about our vehicles. OPENMATICS' Telematics Solution was integrated in our BSAS (bus stop announcement system) so our passengers get up-to-date information. We were able to increase safety and reduce costs by changing particular behaviour of our drivers. We are planning to move forward to OPENMATICS Platform 2.0 soon. We would like to use more smart solutions from OPENMATICS in our company and are currently considering an Entertainment solution with onboard hotspot and Depot Management to monitor vehicles entering and leaving depot with Bluetooth Smart TAGs.

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KMB & LWB

1. In written submissions provided to the Committee, dated 24 April 2018, (attached at **Annex IV**, but also available on the Committee's website www.irc-bus.gov.hk/eng/bundles.html) KMB stated that: (paragraph 19)

“Since 2015, KMB has taken the initiative to equip its buses with speed limiters, black boxes and surveillance cameras to monitor the driving performance of bus captains as well as to assist in accident investigation.”

2. Please confirm, if it is the case, that Asia, ZF Services and Openmatics supplied the tachograph/telematics systems to KMB, Long Win Bus Company Limited (“LWB”) and Kwoon Chung/NLB and, if so, please describe when that was done for each respective company and the component parts of the equipment, explaining how they interface in order to produce the data provided to the customer. If Asia, ZF Services and Openmatics did supply such equipment to KMB, were they aware at any time of any plan by KMB to introduce a Real-Time Operations Management (“ROM”) system. If so, did they know of any plan by KMB to interface the tachograph/telematics system with the ROM system? If there was such a plan by KMB, are they aware of why it was not implemented by KMB?

3. In written submissions provided to the Committee, dated 18 May 2018, (attached at **Annex V**) KMB and LWB described the capabilities and use made of “black boxes” installed on their franchised buses: (page 4)

- “By means of a computer programme, black boxes will capture: (i) records of speeding; (ii) malpractice of harsh braking; and/or (iii) abrupt acceleration for analysis. Further information, e.g. the corresponding bus registration numbers and route numbers, can be retrieved with the assistance of other systems, such as Terminus Management System (TER), Fleet Management Information System (FMI) and Bus Onboard Monitoring System (BOM). It takes about 10 days to retrieve such data for analysis, where necessary, further disciplinary actions will be taken.
- ...
- Identification of the BC of a particular bus is done through our Terminus Management System (TER).
- The data do not stipulate the speed limit at any particular place at which it provides information of the speed of the bus.

- The speed limit is obtained manually via the assistance of other system, such as), Fleet Management Information System (FMI) and Bus Onboard Monitoring System (BOM).”
4. The submissions go on to assert that (attached at **Annex VI**): (page 8)
- “...The black box real-time monitors the driving speed. Once the speed has reached the speed limit, it will trigger an alert (both sound and signal lamps) on the dashboard to alert the bus captains.
 - The black box real-time captures (i) records of speeding; (ii) malpractice of harsh braking; and/or (iii) abrupt acceleration. These data are transmitted to our headquarters for analysis. A computer program will generate exception reports from the data collected...”
5. (i) If Asia, ZF Services and Openmatics did supply tachograph/telematics equipment to the franchised buses of KMB and/or LWB, is that equipment capable of recording, as described above, the speed, deceleration and acceleration of the buses? Does the system in fact capture that data and does it give an audio/visual alert in the driver’s cab if the bus reaches a speed at or above a prefixed speed, as described above? Is the alert generated immediately on the vehicle reaching that prefixed speed? What prefixed speed was set?
- (ii) How are data transmitted from the bus to “headquarters”? Is the system capable of generating such an alert at “headquarters”, simultaneously with the alert generated in the bus driver’s cab? If not, does such a system exist? If so, are Asia, ZF Services and Openmatics aware of its use in any other overseas jurisdictions on either buses or heavy goods vehicles? If so, please provide brief details of that use.
- (iii) Did Asia, ZF Services and Openmatics supply KMB and/or LWB with any or all of the Terminus Management System, the Fleet Management Information System and the Bus Onboard Monitoring System? If so, or if Asia, ZF Services and Openmatics know in any event, please provide brief details of the operation of those systems relevant to the generation of reports by the tachograph/telematics systems of excessive speeding, sharp braking or acceleration.

NLB

6. In written submissions provided by NLB to the Committee, dated 24 April 2018, (attached at **Annex VII**, but also available on the Committee's website www.irc-bus.gov.hk/eng/bundles.html) it was stated: (paragraph 2)

“Under TD’s regulations and franchise commitment, all our buses (130 licensed buses as on March 2018) are installed electronic recording device and speed limiters. The recording device which called “Electronic Data Logger” (or so-called “Black Box”) will record geographic location, speed, brake force, gear and vehicle orientation on every second during bus in operations. This information will send to our backend computing network of our company and retrievable at designed computer in occasion to incident investigation.”

7. The submissions go on to assert of the data described above (attached at **Annex VIII**): (paragraph 8)

“These data will also feedback to our company computing network when bus operates, that said we can use this function to monitor our bus captain in real-time situation. However, the data retrieval and performance monitoring are manual process, we conduct real-time monitoring when complaint and incident are reported for investigation.”

8. If Asia, ZF Services and Openmatics know, please describe the system by which the data are recorded on the electronic data logging system on a bus are “feedback to our company computing network”. Is that done at the same time that the information is recorded in the black box on the bus itself?

9. Although it is said that the “data retrieval and performance monitoring are manual process”, with appropriate software, could that be performed automatically to generate reports, for example, of speeding over a pre-set speed limit?

10. Next, the submissions go on to assert: (paragraph 8)

“As per commencement of 2nd generation Black Box system in late-2017, it provides lowest level of raw data of its data log. Additional application such as generation of exceptional report of vehicle speed at certain location is not included. We are now developing our in-house software to provide such information for bus captain performance monitoring purpose. At present, we will check and consolidate the raw data from data log manually upon traffic incident and passenger complaint investigation.”

11. Annex 7 to the NLB's written submissions, headed "Bus Safety Features and Standard List" (attached at **Annex IX**), states under the subheading "Bus Safety Features adapted in NLB buses":

"6. Latest version of event data recorder (ZF Openmatics) system for fleet management control and accident log."

12. Did Asia ZF and/or Openmatics supply to NLB the "2nd generation Black Box system in late-2017"? If so, please describe what the changes were, providing information of the component parts and how they interact with one another to provide data of the performance of the bus.

13. Finally, the submissions assert (attached at **Annex X**): (paragraph 2)

"Through our in-house information technology team, we planned to develop an exceptional report system of using "on bus" Black Box data log to generate reports actively to spot any bus captain with potential hazard of their driving habit."

14. If Asia ZF and/or Openmatics did supply to NLB the "2nd generation Black Box system in late-2017", is that system capable of generating an exceptional report, for example of speeding above a stipulated limit, in real-time, that is to say at the time of the occurrence of the event, on both the bus itself and elsewhere at a control office of NLB? If so, are there systems available which would permit immediate communication of the receipt of the exceptional report from the control office to the driver's cab of the bus in question? If so, are Asia ZF and/or Openmatics aware of the use of such an overall system on buses or heavy goods vehicles in any other overseas jurisdictions? If so, please provide brief details of the use of such an overall system.

Bus fleet

- ~~16. In accordance with TD's guideline, franchised buses must retire before they reach the age of 18 years. Nevertheless, with a view to providing a younger fleet with the latest safety-related features, and keeping pace as far as practicable with progressively more stringent emission control standards, we have invested heavily in bus fleet replacement in the past few years. As a result, the average age of KMB's bus fleet has been reduced from 11 years in 2014 to 7.5 years in 2017.~~
17. Moreover, in order to ensure the quality of maintenance workers servicing its bus fleet, KMB operates its own Technical Training School, which is the largest of its kind in Hong Kong, and has produced more than 2,000 qualified mechanics over the years through its own accredited apprenticeship scheme.
18. KMB has also pledged to maintain its bus availability rate (i.e. the proportion of the bus fleet that is available for active service) at 92.5%, and consistently achieved an actual availability rate of 93% or above in recent years. This achievement has been made possible by the continuous effort of our maintenance staff to perform regular and ad-hoc inspections and maintenance work on the bus fleet, thereby reducing mechanical breakdowns and effectively increasing the safety and reliability of the buses.
19. Since 2015, KMB has taken the initiative to equip its buses with speed limiters, blackboxes and surveillance cameras to monitor the driving performance of bus captains as well as to assist in accident investigation. Such equipment has subsequently become part of the franchise requirements.

~~*Service delivery*~~

- ~~20. KMB always strives to meet the demand of the general public for public bus services that are often beyond the level stipulated in the Schedule of Services. This has been made possible by the judicious redeployment of available resources.~~

Further Issue/Question (4)(b)

Of the statement in answer to Q (8) (b) that "...it needs time to generate data with irregularities",

- please describe that process indicating how much time is required.
 - Are the data retained and, if so, for how long?
 - If the black box is assigned to a particular bus, how is the driver of that bus at any given time identified?
 - Does the data stipulate the speed limit at any particular place at which it provides information of the speed of the bus?
 - If not, how is that information obtained?
-

Response

KMB & LWB

- By means of a computer programme, black boxes will capture: (i) records of speeding; (ii) malpractice of harsh braking; and/or (iii) abrupt acceleration for analysis. Further information, e.g. the corresponding bus registration numbers and route numbers, can be retrieved with the assistance of other systems, such as Terminus Management System (TER), Fleet Management Information System (FMI) and Bus Onboard Monitoring System (BOM). It takes about 10 days to retrieve such data for analysis, where necessary, further disciplinary actions will be taken.
- All the data in black boxes will be archived after one month and then retained for one year.
- Identification of the BC of a particular bus is done through our Terminus Management System (TER).
- The data do not stipulate the speed limit at any particular place at which it provides information of the speed of the bus.
- The speed limit is obtained manually via the assistance of other system, such as Fleet Management Information System (FMI) and Bus Onboard Monitoring System (BOM).

Further Issue/Question (4)(f)

Given that it is said that data from the black boxes are transmitted to “bus headquarters” with “a delay of about 10 seconds”, is any real-time use made of that data? Does the real-time data capture the frequency of the brakes being applied abruptly and/or that a bus is being driven at speed around a sharp bend?

Response

KMB & LWB

- There is real-time use of the data. The black box real-time monitors the driving speed. once the speed has reached the speed limit, it will trigger an alert (both sound and signal lamps) on the dashboard to alert the bus captains.
- The black box real-time captures (i) records of speeding; (ii) malpractice of harsh braking; and/or (iii) abrupt acceleration. These data are transmitted to our headquarters for analysis. A computer programme will generate exception reports from the data collected. These exception reports are followed up by the actions described in the our response to Further Issue/Question 4(a) and 4(b) above.

(2) Design, build and deployment of Buses

~~All NLB licensed buses, both pre-owned buses and new buses are common bus model used in Hong Kong. During the vehicle procurement process, we requested vehicles suppliers to supply vehicles must comply standard and requirement of Hong Kong Road Traffic Ordinance, Road Traffic (Construction and Maintenance of Vehicles) Regulations and Franchise commitment given by TD. When new vehicles arrive, the supplier will send it to TD of proceeding “Type Approval” procedure to prove the design, construction and structure is roadworthy. The bus safety features is listed in Annex 7.~~

~~Refer to existing arrangement, either pre-owned or new build buses, has performed tilting test during “Type Approval” procedure when they first register in Hong Kong. We have no special request to supplier of both pre-own vehicle and new bus neither conduct collision test nor provide collision test report for our assessment.~~

Under TD’s regulations and franchise commitment, all our buses (130 licensed buses as on March 2018) are installed electronic recording device and speed limiters. The recording device which called “Electronic Data Logger” (or so called “Black Box”) will record geographic location, speed, brake force, gear and vehicle orientation on every second during bus in operations. This information will send to our backend computing network of our company and retrievable at designed computer in occasion to incident investigation. At present, a random selected 50 trips of Black Box data will be retrieved every month and this random check report will send to TD for their record.

~~In addition, 11 buses (as on April 2018, Air-conditioned double decker) of our fleet equipped with on-board video recording system which record video image from 8 cameras which located inside and outside the buses, the details are as follows:~~

Camera Location	Video Capture Area
1. Saloon mirror of lower deck	Lower deck saloon
2. Rear wall at back of driving console	Bus Front with Entrance Door
3. Ceiling of exit door	Luggage Rack
4. Ceiling of exit door	Exit Doorway and Exit Door
5. Near left external mirror	Left side of the bus face to rear
6. Near right external mirror	Right side of the bus face to rear
7. Ceiling of staircase	Staircase
8. Bus front of upper deck	Upper deck saloon

The live and recorded video can be retrieved remotely at designed computer in our office when the bus main switch is on. In normal situation, the video files will be kept in on-board storage device for about 10 days, subject to bus operating hours.

Through our in-house information technology team, we planned to develop an exceptional report system of using “on-bus” Black Box data log to generate reports actively to spot any bus captain with potential hazard of their driving habit.

~~There are multiple factors to determine bus type deployment in designated route, include passenger capacity, operation efficiency, mechanical limitation, TD requirement etc.~~

~~In our major service hub such as Tung Chung Town Centre Bus Terminus, Mui Wo Ferry Pier Bus Terminus, Ngong Ping Bus Terminus and Yuen Long Station Bus Terminus, driver rest facilities are provided such as air-conditioned indoor environment with seats and sanitary facilities in the said locations, which allow our bus captain to have better environment for short break after each trips.~~

~~At the same time, any departure time adjustment will be recorded by terminus regulator with reasons of adjustment (i.e. late return of bus cause by traffic congestion, that said any actual working hours information will be recorded. And these information can cross check with our scheduled working hours for spotting the discrepancy and identify the reasons behind.~~

(8) Performance management

All licensed buses are installed Electronic Data Logging system (so called “Black Box”) which record geographic location, speed, brake force, gear and vehicle orientation on every second during bus in operations. These data will also feedback to our company computing network when bus operates, that said we can use this function to monitor our bus captain in real-time situation. However, the data retrieval and performance monitoring are manual process, we conduct real-time monitoring when complaint and incident are reported for investigation.

In-bus close circuit TV video may also be retrieved in real-time to monitor the bus captain or passenger situation in restricted to emergency and security purpose.

As per commencement of 2nd generation Black Box system in late-2017, it provides lowest level of raw data of its data log. Additional application such as generation of exceptional report of vehicle speed at certain location is not included. We are now developing our in-house software to provide such information for bus captain performance monitoring purpose. At present, we will check and consolidate the raw data from data log manually upon traffic incident and passenger complaint investigation.

~~Secret check of bus captain performance by means of “Mystery Passenger” is conducted in monthly basis. A member of non-uniformed office staff will conduct a ride check on a random selected date, and the staff will check the items on our provided check-list to review service quality from view of general passenger. The ride check report will follow-up by operations team and consider to take any discipline actions on concerned bus captain if necessary. A sample check list for “Mystery Passenger” to record is listed in Annex 9.~~

Bus Safety Features adapted in NLB buses

- ~~1. Engine compartment separate off from the rear part of bus body with insulation~~
2. Air-conditioning system will automatic shutdown when trigger by fire in engine compartment
3. Electronic Braking System (EBS) control (including ABS and ASR functions)
4. Fire suppression system with alarm in engine compartment
- ~~5. Speed limiter~~
6. Latest version of event data recorder (ZF Openmatics) system for fleet management control and accident log
- ~~7. Hinge type emergency exit at lower deck offside rear~~
8. Break glass type emergency exist at upper deck rear
9. Fire extinguisher at lower deck near driving console
10. Provision of break-glass hammers
11. Front crash protection bar at upper deck
12. Horizontal guard bar at exit door
13. Door closing buzzer and warning lamp when exit door is closing
14. Sensitive edge safety exit door system
15. Inter-lock safety entrance door system
16. Closed circuit TV at upper deck, lower deck, exit door, exterior and driver console with video record function (for double deck bus only)
17. Closed circuit TV for bus reversing
18. One-piece clear laminated front windscreen at upper deck (for double deck bus only)
19. Tempered grey tinted side and rear glazing
20. High-back passenger seats with 3-point seat belts at all exposed seats
21. Double handrails at stairs (for double deck bus only)
22. Continuous railing and grab pole colour with high contrast to ambient environment
23. Non-slippery floor
- ~~24. All steps and edges in high contrast~~

(2) Design, build and deployment of Buses

~~All NLB licensed buses, both pre-owned buses and new buses are common bus model used in Hong Kong. During the vehicle procurement process, we requested vehicles suppliers to supply vehicles must comply standard and requirement of Hong Kong Road Traffic Ordinance, Road Traffic (Construction and Maintenance of Vehicles) Regulations and Franchise commitment given by TD. When new vehicles arrive, the supplier will send it to TD of proceeding "Type Approval" procedure to prove the design, construction and structure is roadworthy. The bus safety features is listed in Annex 7.~~

Refer to existing arrangement, either pre-owned or new build buses, has performed tilting test during "Type Approval" procedure when they first register in Hong Kong. We have no special request to supplier of both pre-own vehicle and new bus neither conduct collision test nor provide collision test report for our assessment.

Under TD's regulations and franchise commitment, all our buses (130 licensed buses as on March 2018) are installed electronic recording device and speed limiters. The recording device which called "Electronic Data Logger" (or so called "Black Box") will record geographic location, speed, brake force, gear and vehicle orientation on every second during bus in operations. This information will send to our backend computing network of our company and retrievable at designed computer in occasion to incident investigation. At present, a random selected 50 trips of Black Box data will be retrieved every month and this random check report will send to TD for their record.

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~~The live and recorded video can be retrieved remotely at designed computer in our office when the bus main switch is on. In normal situation, the video files will be kept in on-board storage device for about 10 days, subject to bus operating hours.~~

Through our in-house information technology team, we planned to develop an exceptional report system of using "on-bus" Black Box data log to generate reports actively to spot any bus captain with potential hazard of their driving habit.

~~There are multiple factors to determine bus type deployment in designated route, include passenger capacity, operation efficiency, mechanical limitation, TD requirement etc.~~



Our Ref: 809098-001/FH/GTL
Your Ref: CSO/IRC-BUS/CR/7-45/16

Date: 26 June 2018

**BY FAX (3104 0254) &
BY EMAIL (peter_chan@irc-bus.gov.hk)**

**Independent Review Committee on
Hong Kong's Franchised Bus Service**
21/F., Queensway Government Offices
66 Queensway
Hong Kong

Attention: Mr. CHAN Ping-fai, Peter

Dear Sirs,

**Re : Assisting in an investigation in relation to a traffic accident which occurred on
10 February 2018 at Tai Po Road, Hong Kong**

1. We act for ZF Friedrichshafen AG and its subsidiaries ZF Services Hong Kong Limited and Openmatics s.r.o. and refer to your letter dated 25 May 2018 and your email dated 22 June 2018.
2. With respect to the queries as raised in the Annexure 3 of your letter dated 25 May 2018, we are instructed to provide you with the answers prepared by our client as attached to this letter.
3. Should you require any further information and/or clarification, please do not hesitate to let us know.
4. Thank you for your attention.

Yours faithfully,



ZHONG LUN LAW FIRM
Encl.

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Annex III

KMB&LWB

1. In written submissions provided to the Committee, dated 24 April 2018, (attached at **Annex IV**, but also available on the Committee's Website www.irc-bus.gov.hk/eng/bundles.html) KMB stated that: (paragraph 19)

"Since 2015, KMB has taken the initiative to equip its buses with speed limiters, black boxes and surveillance cameras to monitor the driving performance of bus captains as well as to assist in accident investigation."

Please note that the Openmatics portfolio does not consist of the aforementioned speed limiters and surveillance cameras. However, the black box is part of the Openmatics telematics system as explained below.

Openmatics entered into a supply contract to deliver telematics systems, dated 16th of April 2013 with Kowloon Bus Company (KMB) and Long Win Bus Company (LWB).

Openmatics started offering telematics services by using the first black box system called the "Mozart Box". Later on, Openmatics replaced the Mozart Box by a successor platform black box called the "Bach Box." However, clients can use both systems in parallel as KMB does.





The telematics system consists of the three main parts:

- Driver Feedback Device:

This device provides visual and acoustic feedback to the driver about four basic threshold values (engine revving, speeding, idling, and acceleration). It is placed in the driver's cabin and connected to the Openmatics onboard unit.



Driver Feedback Overview means the driver will be informed about the information by beeping and illuminating four LEDs lights if the - calibrated - thresholds will be reached.

	Engine	Indicates, if engine RPM reaches the threshold that is defined by KMB and calibrated into the system by Openmatics
	Speed	Indicates, if vehicle speed reaches the threshold that is defined by KMB and calibrated into the system by Openmatics
	Idling	Indicates, if idle time of the engine reaches the threshold that is defined by KMB and calibrated into the system by Openmatics, while the vehicle speed is 0.
	Acceleration	Indicates if speed of the vehicle increases or decreases faster than defined values (set by KMB and calibrated into the system by Openmatics), plus tilting

Specification is available under:

<https://aftermarket.zf.com/go/openmatics/hw-sw-datasheets/driver-feedback-hw-datasheet.pdf>

To our knowledge, the Driver Feedback system was installed in the accident vehicle.

The Driver Feedback thresholds for the accident bus were initially defined by KMB and then calibrated by Openmatics to fit KMB's defined parameters.

According to the history, the four thresholds on the accident vehicle were defined by KMB and then calibrated by Openmatics latest at:

- 24.7.2017

According to our best knowledge at the time of the accident, the thresholds were:

Add configuration

Details Settings Messages Areas

Configuration of acceleration values

* Acceleration signal source Change in vehicle speed

* Acceleration [m/s²] > 1.15

* Deceleration [m/s²] > 2.3

* Tilting angle [degrees] > 44.0

Configuration of excessive speed values

* Speed [km/h] > 75.0

* Speed in areas [km/h] > 75.0

Configuration of idling values

* Idle time [min][sec] > 15 0

Configuration of engine values

* Engine revolutions [RPM] 3000.0

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- Mozart or Bach Box as a Telemetry Unit:

This telemetry unit is the telematics hardware, which can host various telematics software applications. One of them is the KMB Raw Data application, which controls the Black box functionality for KMB.

Pictured below is the Mozart box



Pictured below is the Bach box



- The AD convertor (ADC):



The ADC converts various analog signals in the vehicle and expands the possibilities of the telemetry unit. One ADC can connect up to 6 analog signals. The AD convertor can convert signals with frequency modulation (such as vehicle speed or engine RPM) to digital values processed by the telemetry unit.

2. Please confirm, if it is the case, that Asia, ZF Services and Openmatics supplied the tachograph/telematics systems to KMB, Long Win Bus Company Limited ("LWB") and Kwoon Chung/NLB and, if so, please describe when that was done for each respective Company and the component parts of the equipment, explaining how they interface in order to produce the data provided to the customer. If Asia, ZF Services and Openmatics did supply such equipment to KMB, were they aware at any time of any plan by KMB to introduce a Real-Time Operations Management ("ROM") system. If so, did they know of any plan by KMB to interface the tachograph/telematics system with the ROM system? If there was such a plan by KMB, are they aware of why it was not implemented by KMB?

Only the 100% subsidiary Openmatics s.r.o., which is a wholly owned subsidiary of ZF Friedrichshafen AG and a company incorporated in Czech Republic with its registered address situated at Podebradova 2842/1, 301 00 Pilsen, Czech Republic, entered into the aforementioned supply contract dated 16th day of April 2013 with Kowloon Bus Company (KMB) and Long Win Bus Company (LWB) for delivery of the telematics systems. ZF Services Hong Kong, which is also a subsidiary of ZF Friedrichshafen AG, was not part of the Supply Contract.

Description as to how the system works, see above.

Regarding the Real-Time Operations Management ("ROM") system we are not aware about any plans by KMB to introduce such a system. Hence, we are neither aware of any plan by KMB to interface the tachograph/telematics system with the ROM system.

3. In written submissions provided to the Committee, dated 18 May 2018, (attached at **Annex V**) KMB and LWB described the capabilities and use made of "black boxes" installed on their franchised buses: (page 4)
 - "By means of a Computer programme, black boxes will capture: (i) records of speeding; (ii) malpractice of harsh braking; and/or (iii) abrupt acceleration for analysis. Further Information, e.g. the corresponding bus registration numbers and route numbers, can be retrieved with the assistance of other systems, such as Terminus Management System (TER), Fleet Management Information System (FMI) and Bus Onboard Monitoring System (BOM). It takes about 10 days to retrieve such data for analysis, where necessary, further disciplinary actions will be taken.
 - Identification of the BC of a particular bus is done through our Terminus Management System (TER).

- The data do not stipulate the speed limit at any particular place at which it provides information of the speed of the bus.
- The speed limit is obtained manually via the assistance of other system, such as), Fleet Management Information System (FMI) and Bus Onboard Monitoring System (BOM)."

We can only answer regarding the Openmatics telematics system but we are not in a position to comment on the Terminus Management System (TER), Fleet Management Information System (FMI) and Bus Onboard Monitoring System (BOM) since we did not provide services in relation to such systems to KMB.

What does the term "BC" stands for?

The Openmatics telematics system installed at KMB can identify:

- records of speeding; recorded every second and stored together with the related GPS data;
- "malpractice" of harsh braking;
- abrupt acceleration.
- the corresponding bus registration numbers with the assistance of other systems

The Openmatics telematics system installed at KMB cannot identify:

- route numbers of certain buses

The data are collected as defined by the system. Every second, the system collects the defined data and sends that data every 30 seconds – if connected to Wi-Fi or other cellular network or via USB– to the defined FDP server. The information is also stored locally on the telemetry unit (black box) for 30 days. But data from the telemetry unit can be lost if it is not downloaded correctly.

4. The submissions go on to assert that (attached at **Annex VI**): (page 8)
- "...The black box real-time monitors the driving speed. Once the speed has reached the speed limit, it will trigger an alert (both sound and signal lamps) on the dashboard to alert the bus captains.
 - The black box real-time captures (i) records of speeding; (ii) malpractice of harsh braking; and/or (iii) abrupt acceleration. These data are transmitted to our headquarters for analysis. A Computer program will generate exception reports from the data collected.

This is done via the Driver Feedback Device as indicated above. This device provides visual and acoustic feedback to the driver about four basic threshold values (engine revving, speeding, idling, and acceleration). It is placed in the driver's cabin and connected to the Openmatics onboard unit.

Regarding records of speeding; "malpractice" of harsh braking; and/or abrupt acceleration please see explanation above.

As indicated above, the data captured by the Openmatics telematics system are transmitted as follows:

The data are collected as defined by the system. Every second, the system collects the defined data and sends that data every 30 seconds – if connected to Wi-Fi or other cellular network or via USB – to the defined FDP server. The information is also stored locally on the telemetry unit (black box) for 30 days. But data from the telemetry unit can be lost if it is not downloaded correctly.

The Openmatics telematics system does not provide features which will generate automatically "exception reports from the data collected".

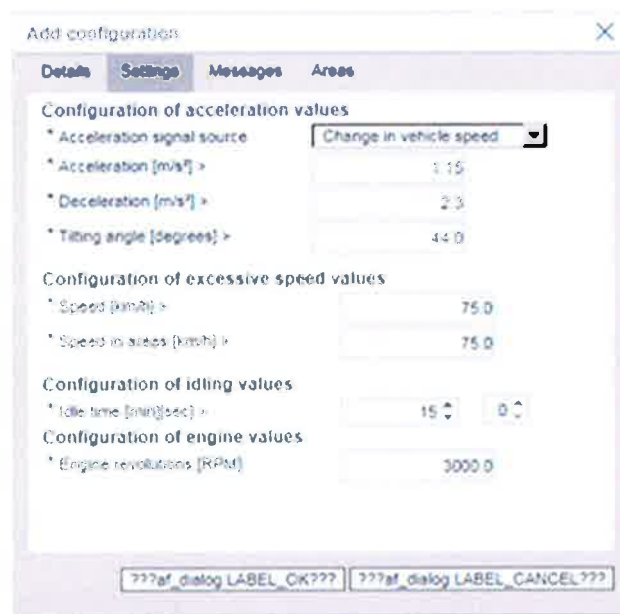
5. (i) If Asia, ZF Services and Openmatics did supply tachograph/telematics equipment to the franchised buses of KMB and/or LWB, is that equipment capable of recording, as described above, the speed, deceleration and acceleration of the buses? Does the system in fact capture that data and does it give an audio/visual alert in the driver's cab if the bus reaches a speed at or above a prefixed speed, as described above? Is the alert generated immediately on the vehicle reaching that prefixed speed? What prefixed speed was set?

As indicated above, only Openmatics is involved.

The telematics system installed at KMB is capable of recording speed, deceleration and acceleration of the buses. However, the deceleration and acceleration of the buses as feature recording this on an ongoing basis is not enabled.

The telematics system, and in particular the Driver Feedback Device will alert immediately the driver by beeping and illuminating four LEDs lights if the - calibrated - thresholds will be reached.

The calibrated thresholds at the time of the accident have been as follows:



- (ii) How are data transmitted from the bus to "headquarters"? Is the system capable of generating such an alert at "headquarters", simultaneously with the alert generated in the bus driver's cab? If not, does such a system exist? If so, are Asia, ZF Services and Openmatics aware of its use in any other overseas jurisdictions on either buses or heavy goods vehicles? If so, please provide brief details of that use.

The data are collected as defined by the telematics system. Every second, the system collects the defined data and sends that data every 30 seconds – if connected to Wi-Fi or other cellular network or via USB – to the defined KMB FDP server. The information is also stored locally on the telemetry unit (black box) for 30 days. But data from the telemetry unit can be lost if it is not downloaded correctly.

The driver will be alerted immediately via the Driver Feedback Device.

"Headquarters" are informed as indicated time delayed on a 30 seconds basis. "Headquarter" receives the data as described herein. However, there is no parallel system, which alerts supervisors outside the vehicle at the "headquarter" the same way as the Driver Feedback Device would alert the Driver immediately.

We are not aware of if other companies provide elsewhere such "real time alert system" which would alert supervisors outside the vehicle.

- (iii) Did Asia, ZF Services and Openmatics supply KMB and/or LWB with any or all of the Terminus Management System, the Fleet Management Information System and the Bus Onboard Monitoring System? If so, or if Asia, ZF Services and Openmatics know in any event, please provide brief details of the operation of those systems relevant to the generation of reports by the tachograph/telematics systems of excessive speeding, sharp braking or acceleration.

Neither Openmatics nor other ZF subsidiaries delivered the following systems to KMB:

- Terminus Management System,
- the Fleet Management Information System and the
- Bus Onboard Monitoring System

Regarding systems of excessive speeding, sharp braking or acceleration by the Openmatics telematics systems see explanation above.

NLB

6. In written submissions provided by NLB to the Committee, dated 24 April 2018, (attached at **Annex VII**, but also available on the Committee's Website www.irc-bus.gov.hk/eng/bimdles.html) it was stated: (paragraph 2)

"Under TD's regulations and franchise commitment, all our buses (130 licensed buses as on March 2018) are installed electronic recording device and speed limiters. The recording device which called "Electronic Data Logger" (or so-called "Black Box") will record geographic location, speed, brake force, gear and vehicle orientation on every second during bus in Operations. This Information will send to our backend Computing network of our Company and retrievable at designed Computer in occasion to incident investigation."

We assume, that the term "Electronic Data Logger" (or so-called "Black Box") means the Openmatics telematics system.

The geographic location, speed and vehicle orientation are recorded every second and transmitted every 30 seconds to KMB's FTP Servers.

Please note that the brake force and gear parameters are not recorded by the Openmatics telematics system. We don't know whether other systems within the vehicle record them.

7. The submissions go on to assert of the data described above (attached at **Annex VIII**): (paragraph 8)

"These data will also feedback to our Company Computing network when bus

operates, that said we can use this function to monitor our bus captain in real-time Situation. However, the data retrieval and Performance monitoring are manual process; we conduct real-time monitoring when complaint and incident are reported for investigation."

As indicated above, although the data is recorded every second, the Openmatics telematics system transmits only every thirty seconds to the designated FTP Servers.

8. If Asia, ZF Services and Openmatics know, please describe the system by which the data are recorded on the electronic data logging system on a bus are "feedback to our Company Computing network". Is that done at the same time that the information is recorded in the black box on the bus itself?

See answers above.

9. Although it is said that the "data retrieval and Performance monitoring are manual process", with appropriate Software, could that be performed automatically to generate reports, for example, of speeding over a pre-set speed limit?

As indicated above, although the data is recorded every second, the data is transmitted every 30 seconds, which would not allow a real time alert system.

10. Next, the submissions go on to assert; (paragraph 8)

"As per commencement of 2nd generation Black Box system in late-2017, it provides lowest level of raw data of its data log. Additional application such as generation of exceptional report of vehicle speed at certain location is not included. We are now developing our in-house Software to provide such information for bus captain Performance monitoring purpose. At present, we will check and consolidate the raw data from data log manually upon traffic incident and passenger complaint investigation."

We assume that the "2nd generation Black Box system in late-2017" means the so-called Bach Box as explained above.

We are not clear what is meant by "provides lowest level of raw data of its data log". Additional application such as generation of exceptional report of vehicle speed at certain location is not included."

11. Annex 7 to the NLB's written submissions, headed "Bus Safety Features and Standard List" (attached at **Annex IX**), states under the subheading "Bus Safety Features adapted in NLB buses":

"6. Latest Version of event data recorder (ZF Openmatics) system for fleet management control and accident log."

We are not clear what the question is about.

12. Did Asia ZF and/or Openmatics supply to NLB the "2nd generation Black Box system in late-2017"? If so, please describe what the changes were, providing information of the component parts and how they interact with one another to provide data of the Performance of the bus.

We assume that the "2nd generation Black Box system in late-2017" means the Bach Box as explained above. It is available since 2014.

Features in comparison:

- Smaller device
- More accurate GPS positioning
- More interfaces

Please note that all available software applications can be installed and work on both devices (Mozart box and Bach Box) in the same way.

Bach Box Specification is available under:

<https://aftermarket.zf.com/go/openmatics/hw-sw-datasheets/bach-datasheet.pdf>

Both systems can be handled by Openmatics simultaneously which means it is up the client to operate the first generation (Mozart Box) and the second generation in parallel (each vehicle uses just one system).

13. Finally, the submissions assert (attached at **Annex X**): (paragraph 2)

"Through our in-house information technology team, we planned to develop an exceptional report system of using "on bus" Black Box data log to generate reports actively to spot any bus captain with potential hazard of their driving habit."

Openmatics is not aware of such activities.

14. If Asia ZF and/or Openmatics did supply to NLB the "2nd generation Black Box system in late-2017", is that system capable of generating an exceptional report, for example of speeding above a stipulated limit, in real-time, that is to say at the time of the occurrence of the event, on both the bus itself and elsewhere at a control office of NLB? If so, are there systems available which would permit immediate communication of the receipt of the exceptional report from the control office to the driver's cab of the bus in question? If so, are Asia ZF and/or Openmatics aware of the use of such an overall system on buses or heavy goods vehicles in any other overseas jurisdictions? If so, please provide brief details of the use of such an overall system.

As indicated above, while the data is recorded every second, it is only transmitted every 30 seconds, which would not allow a real time alert system alerting defined persons or the "headquarter". However, the driver would be alerted immediately via the Driver Feedback Device as mentioned above.

香港專營巴士服務
獨立檢討委員會

香港金鐘道66號
金鐘道政府合署21樓

本函檔號 Our Ref.: CSO/IRC-BUS/CR/7-45/16
來函檔號 Your Ref.: 809098-001/FH/GTL



**Independent Review Committee on
Hong Kong's Franchised Bus Service**

21/F, Queensway Government Offices,
66 Queensway, Hong Kong

電話號碼 Tel No.: (852) 2867 5324
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8 August 2018

Mr Frederick HUI
Partner, Zhong Lun Law Firm
4/F Jardine House
1 Connaught Place
Central, Hong Kong
(Email: frederickhui@zhonglun.com)

BY EMAIL & BY POST

Dear Mr HUI,

**Written Submissions for Consideration by the
Independent Review Committee on Hong Kong's Franchised Bus Service**

The Committee thanks Openmatics and ZF Friedrichshafen for the information supplied to the Committee in the letter dated 25 May 2018 and for the evidence provided by Mr KULIŠ on 14 July 2018. However, the Committee seeks further information from the companies.

2. In evidence on 7 August 2018, the representatives of Kowloon Motor Bus Company Ltd ("KMB") and Long Win Bus Ltd (LWB") testified that [Transcript Day 12; 7 August 2018, pages 107-108; attached at **Annex**]:

"So we have been talking to different parties on how we may know the speed limits in different locations, different areas, so that when the vehicle reaches a certain location, we will know that it is 70 kmh or 50 kmh as the limit, because right now we can't tell one from the other, so we set it at 70 kmh.

If we know that in that particular location the speed limit is 50 kmh, then the alarm will be triggered. We have conducted a test drive, by incorporating the road speed limits into the black box, so that the road speed limit is known by the system, and the test drive tells us that it's a possible solution.

We will explore on how this may be taken forward, and if it is tested to be feasible it will be incorporated into our fleet, so that when the speed limit, whether it's 50 kmh or 70 kmh, is exceeded, an alarm will be triggered. That would represent a great improvement over the current situation."

3. Those representatives went on to say:

“We have just received the digital map and the Openmatics have helped us to incorporate that into the system. We have a vehicle fitted with this new system and we have conducted a test drive. So there will be real-time information provided to the bus captain that the limit has been exceeded.”

4. Please describe the assistance that Openmatics provided to KMB and LWB in incorporating the digital map into the system and the resulting capabilities of the overall system, in particular the capability to distinguish the speed of a vehicle on roads in which different speed limits are imposed and record the occasions on which the imposed speed limit is exceeded. Please describe the assistance, if any, provided by Openmatics in the conduct of the test drive and the ensuing results.

5. The Committee would be very grateful for your reply in writing **on or before 22 August 2018**. Should you have any queries, please feel free to contact me or Mr Justin TO at 2867 4612.

6. The information provided in the written responses and attached documents will be considered by the Committee in reviewing the matters it is directed to consider under the terms of reference of the Committee and in drawing up its recommendations. Please also be advised that all written responses and attached documents will be treated as public information and, at the discretion of the Committee, may be published on the Committee’s website.

Yours sincerely,



(CHAN Ping-fai, Peter)

Secretary, Independent Review Committee on
Hong Kong’s Franchised Bus Service

cc ZF Services Hong Kong Ltd
(Attn: Ms Lilian LAI, Managing Director)
(Email: Lilian.Lai@zf.com)

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<p>1 my understanding is correct. So if the bus in this case 2 exceeds 75 kilometres per hour, the threshold would be 3 considered crossed; is that correct?" 4 Then at line 17, Mr Chan asked this question: 5 "What is the difference between these two 6 parameters, speed and speed in areas?" 7 Perhaps you would be good enough to read to yourself 8 what follows, from line 19 right through to page 155 at 9 line 9. Just take your time to read that through, 10 please. 11 Have you been able to read that through? 12 MR LEUNG KIN WANG: (In English) Yes. 13 MR DUNCAN: If I understand that evidence correctly, 14 Mr Kulis is suggesting two different ways whereby there 15 may be the two different speed limits set up. Is that 16 your own understanding? 17 MR LEUNG KIN WANG: (In English) Yes. 18 MR DUNCAN: Thank you. The first is what we can see on 19 page 151. This is at line 2: 20 "... you need also to configure the areas in some 21 other window, or enter some geo-fencing into the 22 system." 23 And at line 7, Mr Chan's question: 24 "Obviously the bus, if you wish to take advantage of 25 the speed in areas parameter, the system would have to</p>	<p>1 And he then proceeds to give an explanation. 2 Now, as I understand it, there is available in 3 Hong Kong digital mapping of our roads; is that correct? 4 MR LEUNG KIN WANG: (In English) Yes. 5 MR DUNCAN: So given what you said a few moments ago, that 6 it would be desirable to have a system whereby speeds in 7 excess of 50 in a 50 zone would be detected, what is 8 your reaction to the possible implementation of either 9 of these two possible routes suggested by Mr Kulis? 10 MR LEUNG KIN WANG: We are glad to learn about this, and, 11 well, because of the IRC, we will be able to have access 12 to official digital maps. 13 The speed limit is an important matter, in respect 14 of different road sections. If the information is 15 incorrect, it would have grave consequences. So we have 16 been talking to different parties on how we may know the 17 speed limits in different locations, different areas, so 18 that when the vehicle reaches a certain location, we 19 will know that it is 70kmh or 50kmh as the limit, 20 because right now we can't tell one from the other, so 21 we set it at 70kmh. 22 If we know that in that particular location the 23 speed limit is 50kmh, then the alarm will be triggered. 24 We have conducted a test drive, by incorporating the 25 road speed limits into the black box, so that the road</p>
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<p>1 know where the bus is to trigger that parameter." 2 Then it concludes at line 23, in that part: 3 "Of course they need to configure or in cooperation 4 with us, we need together to configure the areas, we 5 need to define results, the rules, then the system is 6 capable." 7 So the commission has heard -- I'm not sure whether 8 you are aware of this -- that Citybus engaged that 9 system, where they have defined, I think, 25 areas and 10 there is provision for feedback for those 25 areas. Are 11 you aware of that? 12 MR LEUNG KIN WANG: (In English) Yes. 13 MR DUNCAN: So that's one. 14 The second one, in which I'm a little bit more 15 interested, is the utilisation of the digital mapping. 16 You can see, I think, mainly from page 154, from line 8, 17 where Mr Chan poses this question to Mr Kulis: 18 "If I have a digital map that is able to show 19 different speed limits on different roads, would I be 20 able to use that combining with the system currently 21 available here, to configure to set different speed 22 thresholds depending on where the bus is on the digital 23 map? Or is that not possible under the system?" 24 Mr Kulis responds: 25 "Definitely it is possible."</p>	<p>1 speed limit is known by the system, and the test drive 2 tells us that it's a possible solution. 3 We will explore on how this may be taken forward, 4 and if it is tested to be feasible it will be 5 incorporated into our fleet, so that when the speed 6 limit, whether it's 50kmh or 70kmh, is exceeded, 7 an alarm will be triggered. That would represent 8 a great improvement over the current situation. 9 MR ROGER LEE: The map is important, because the speed limit 10 can change from time to time. For example, if there is 11 an accident or if there is a road excavation, the limit 12 may be changed very quickly. So we need to have 13 a so-called live map. We have just received the digital 14 map and the Openmatics have helped us to incorporate 15 that into the system. We have a vehicle fitted with 16 this new system and we have conducted a test drive. So 17 there will be real-time information provided to the bus 18 captain that the limit has been exceeded. 19 But geo-fencing, it will take a lot more time, 20 because that would have to do with the control over 21 acceleration. We have one vehicle fitted out for that 22 trial so far. 23 MR DUNCAN: Why did you say that "because of the IRC we 24 would be able to have access to the digital maps"? 25 MR LEUNG KIN WANG: That's just my gut feeling. Maybe it's</p>



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Our Ref: 809098-001/FH/GTL
Your Ref: CSO/IRC-BUS/CR/7-45/16

Date: 12 September 2018

**BY FAX (3104 0254) &
BY EMAIL (peter_chan@irc-bus.gov.hk)**

**Independent Review Committee on
Hong Kong's Franchised Bus Service**
21/F., Queensway Government Offices
66 Queensway
Hong Kong

Attention: Mr. CHAN Ping-fai, Peter

Dear Sirs,

**Re : Assisting in an investigation in relation to a traffic accident which occurred on
10 February 2018 at Tai Po Road, Hong Kong**

1. We refer to your letter dated 8 August 2018.
2. With respect to the queries as raised in paragraph 4 of your letter, we are instructed to provide you with the responses below:
 - (a) *"the assistance which Openmatics have provided to KMB in incorporating the digital map into the system"*

Openmatics provided KMB with an older Driver Feedback app configuration which contains high-speed zones, in order for KMB to test the capability of the current system to handle 2-zones situation for Driver Feedback criteria.
 - (b) *"The resulting capabilities of the overall system, e.g. the capability to distinguish the speed of a vehicle on road with different speed limits and to record the occasions on which the speed limit is exceeded."*

The Openmatics system is capable of distinguishing different zones in real-time and adapt the Driver Feedback speed limits accordingly, together with all of the other applications that are running (black box feature and others). In this regard, exceeding the speed limit would be recorded.

Please note that such a system would require correct speed limit input because the system could not recognise the speed limit(s) by itself. Different speed limits at different locations must be programmed and loaded into the system manually. Thus, any temporary changes (such as new constructions zones or other changes) would not be recognised in real time.

- (c) *"If any, assistance which Openmatics provided in respect of the test drive and the ensuing results"*

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Openmatics provided the high-speed zones configuration itself and on-site support to test that the system can identify different speed limits in high-speed zones, with real-time reaction. Result was mostly positive in that the system can, in real time, process zones covering most of the Hong Kong area, as long as the respective speed limits for different zones are programmed / calibrated accurately.

3. Should you require any further information and/or clarification, please do not hesitate to let us know.
4. Thank you for your attention.

Yours faithfully,


ZHONG LUN LAW FIRM