

**REPORT OF THE INDEPENDENT WORKING GROUP
ASSESSING THE ARTICULATED BUS TRIAL**

JUNE 2013

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1. INTRODUCTION & SUMMARY

- 1.1.1 Following the re-negotiation of the VAT sharing agreement between the UK and Manx Governments, the Isle of Man suffered a substantial loss of tax revenue. Consequently, the Manx Government decided to critically examine all areas of Government expenditure to achieve savings.
- 1.1.2 Among the more unusual cost saving options was the introduction of articulated buses to reduce the cost of transporting students to school.
- 1.1.3 Public criticisms of this proposal caused the Council of Ministers to set up an independent working group (IWG) to examine and evaluate a trial of articulated buses on Island.
- 1.1.4 The IWG invited public participation, reviewed research into public views, examined all available evidence about articulated buses and considered the wider legislative and organisational framework for transporting students to school.
- 1.1.5 The IWG report is designed to assist the Council of Ministers in taking a decision about the introduction of articulated buses; significantly, the IWG has identified two main areas that would need to be addressed should it to be agreed that articulated buses be introduced into the Isle of Man:
- that no safety case has been completed into the use of the vehicles on what is apparently an unusually specific use for this vehicle type, i.e. solely for use on a 'school service'; and
 - that there are pertinent infrastructure changes that should be addressed prior to any introduction. The IWG identified an indicative cost of £604,500 for implementation of these changes on one proposed route.
- 1.1.6 The Report also documents aspects of the current arrangements for transporting students to school that may prove helpful in the future.

2. BACKGROUND

2.1 *Financial Position*

- 2.1.1 Changes to the VAT sharing agreement with the UK between 2007 and 2011 reduced annual Isle of Man Government revenue by around £200 million per annum, or 40% of net Government spending. As a result, spending has been reduced in relative terms by around £60 million between 2010/11 and 2012/13, and spending reductions will continue over the next three years to re-balance the budget.
- 2.1.2 The spending reductions affected all Government departments. The Department of Community Culture and Leisure (DCCL) faced a net budget reduction of £2.2 million (14.4%) from 2010/11 to 2013/14. Over the two financial years 2014/15 and 2015/16 further savings of between £2 million and £2.5 million are required if the Department is to achieve its targets set by Council of Ministers.

- 2.1.3 As well as the immediate reduction in budget provision, Government departments were directed by the Chief Minister to investigate revenue generating ideas, cost savings and more efficient ways of working, with the overarching objective of protecting, as far as possible, essential public services.
- 2.1.4 DCCL has proposed a more efficient use of resources to Treasury, through the introduction of articulated buses on school routes at Bus Vannin, the bus operation division of DCCL, generating annual revenue saving of £300,000 and a capital programme reduction of £3,000,000 for bus replacement. An extract from the paper from DCCL to Treasury dated July 2012 regarding the Replacement Bus Strategy is attached for information at Appendix 1.
- 2.1.5 Since 2010, the Bus Vannin bus fleet has fallen from 90 to 70 vehicles. The buses withdrawn only operated during the peak periods, mainly carrying schoolchildren, and these journeys have been consolidated into the service bus network. Despite this, eight secondary school journeys carry significant numbers of children and require two double deck buses to operate each journey. The purchase of 10 articulated buses, which hold up to 150 passengers, (62 more than the standard modern double deck), would allow the withdrawal of 15 double deck buses on school routes, with 2 articulated buses being used as engineering spares. This would save on operating costs.
- 2.1.6 The introduction of articulated buses on the Isle of Man would require a change in highways legislation; the responsibility of the Department of Infrastructure (DOI). As the DOI has expressed concerns about the suitability of articulated buses on the Isle of Man, the Council of Ministers requested that a trial be conducted to clarify and evaluate those concerns.

2.2 *Establishment of the Independent Working Group*

- 2.2.1 To ensure the fairness and impartiality of the trial, Council of Ministers agreed that it be robustly and independently assessed. An independent working group (IWG) was therefore established to oversee the trial and ensure that all appropriate issues were identified and considered. The IWG comprised representatives from the Department of Community Culture and Leisure, Department of Infrastructure, Department of Education and Children, Treasury, and was chaired by the Deputy Director of the Isle of Man Ship Registry, a representative of a Department with relevant safety experience and expertise and no vested interest in the introduction of articulated buses.
- 2.2.2 A member external to Government, Mr Brendan O’Friel, Chairman of TravelWatch Isle of Man, was appointed to act as an independent assessor of the work of the Group. A copy of the terms of reference for the IWG is attached at Appendix 2.

2.3 *History of Articulated Buses in the UK*

- 2.3.1 Articulated buses have been used in Europe and many other countries, such as Israel (main urban areas), USA (urban centres), Canada (urban centres), Norway, China, Australia and New Zealand for many years. Operation in the UK was limited until 1999 when they were introduced in Birmingham, Manchester, Leeds and

Glasgow to cope with high demand on busy urban and intra-urban routes within large conurbations. The IWG understands that at its peak, the London fleet stood at 500.

- 2.3.2 Following the election of Boris Johnson as Mayor of London, whose election manifesto promised the replacement of the articulated buses, the articulated buses were gradually withdrawn from day to day use in London as their 5 year operating contracts came to an end. However, Transport for London (TfL) continued to regularly use articulated buses for special events; for example articulated buses were used extensively in 2012 for carrying passengers of all ages to and from the Olympic venues. A number of the ex-London buses are now in use in Malta with Arriva.
- 2.3.3 Outside London articulated buses have been used in many other cities and conurbations on high capacity routes, such as the 135 between Bury and Manchester (A GMPTE route) , the route 4 in Leeds (now withdrawn). The group is aware that many of these vehicles do carry school children as a routine, but the group is not aware of any route in a UK city where an articulated vehicle is used on a specific 'School Service' It should be noted that many areas operate 'School Services' in a similar manner to Bus Vannin (GMPTE for example) where the service is predominately for the carriage of school children, but also for other customers.

2.4 *2009 Articulated Bus Trial*

- 2.4.1 The first articulated bus trial in the Isle of Man was conducted in 2009. Whilst DCCL deemed the trial to be successful, there is no substantial documentary evidence to support this conclusion.
- 2.4.2 Following the trial, the DOI raised a number of concerns regarding the suitability of articulated buses for Manx roads.
- 2.4.3 To ascertain the public view, and as part of a wider consultation, the DOI conducted a consultation in September 2010 on changes required to legislation to permit the introduction of articulated buses. The consultation received only 10 responses, but all were strongly against the introduction of the vehicles and there was extensive material on the forums. The DOI Minister at the time decided not to proceed with the legislation.

3. 2013 ARTICULATED BUS TRIAL

- 3.1.1 The second articulated bus trial in the Isle of Man took place over a four week period which commenced on 18th February 2013, until Friday 15th March 2013.
- 3.1.2 To permit the use of two articulated buses at any one time on the roads in the Isle of Man for the duration of the trial, the Department of Infrastructure made an Order under the Road Traffic Act 1985, permitting the articulated buses on roads in the Isle of Man for a period of one month. In addition, the International Circulation Order facilitated the operation of a foreign registered vehicle on the Isle of Man for one month, without the need for it to be tested, registered and taxed on the Island.
- 3.1.3 During the trial, the articulated buses were initially used extensively on the Port Erin and Port St Mary Castle Rushen High School and positioning routes, (service nos. 1,

2, 11, 61 and 62). These routes were chosen as they carry significant numbers of both students and regular passengers, and would therefore provide a good indication of the issues and consequences of the introduction of the buses. The positioning route is the journey to position the bus in the correct location to commence the school route. Positioning routes, like the school routes, collect fee paying passengers in addition to students.

- 3.1.4 The trial on the Southern route was followed by the western and northern QE2 High School routes (service nos. 3, 5, 6, 6A, 50, 51, 52 and 57). In addition, the trial undertook one return journey of the Douglas High School routes to St Ninians and Bemahague, (service nos. 52 and 53). A test run to Ballakermeen High School prior to the start of the trial period confirmed that the site was unsuitable for articulated buses.
- 3.1.5 During the trial, members of the IWG travelled on the positioning and school routes to and from CRHS, QE2, and St Ninians/Bemahague. Two articulated bus journeys were arranged to which Tynwald Members were invited to join, and the No 3 Douglas to Ramsey return route on Saturday 9th March ran using an articulated bus for regular fee paying passengers.
- 3.1.6 During the period of the trial, the articulated buses carried approximately 5,000 passengers on 80 journeys.
- 3.1.7 Disappointingly, during the trial DCCL had to deal with a number of mechanical issues arising from the length of time these buses were left idle, and the Department's desire not to incur significant maintenance costs for vehicles which it did not own. As a consequence, the trial was interrupted with a total of 4 mechanical break-downs, and a total of 3 buses were used during the trial period. However the trial was not about the reliability of those particular buses, but the feasibility of using articulated buses on Manx roads and for school journeys.
- 3.1.8 During the course of the trial, the Economic Affairs Division of the Treasury, at the request of the IWG, undertook a survey of both adult and student bus passengers, to ascertain customer satisfaction. In addition, the opinions and experiences of other key stakeholders were sought, including the schools, bus drivers, emergency services and members of the public.

4. PUBLIC PERCEPTION

- 4.1.1 During both the Tynwald and House of Keys debates on the introduction of articulated buses, one of the key issues raised was in relation to their safety. This concern was mirrored on the public forums and in the letters from the public received during the trial.
- 4.1.2 Public perception in the UK regarding the safety of articulated buses has been influenced by Boris Johnson's 2008 conservative mayoral manifesto, when he claimed that articulated buses have twice as many collisions with pedestrians and cyclists than other buses. The claim was based on figures given to the London Assembly for accidents on articulated and non-articulated buses in 2007. However, the figures quoted compared statistics from the busiest urban corridors in London, which were operated by articulated buses, with rural and suburban routes operated by rigid buses.

4.1.3 A TfL study of all 12 articulated bus routes and 15 rigid bus routes on comparative busy inner city routes, released to the London Assembly in January 2008, shows that incidents per million miles are almost identical (pedestrian: artics 5.6, rigid 5.1; cyclists: artics 2.62, rigid 2.78).

4.1.4 When presenting the figures to the London Assembly (Jan 17, 2008), David Brown, Transport for London's (TfL's) Head of Surface Transport, said:

'the incidents that take place are random, to do with the road networks themselves and to do with weather conditions. They are not related to the type of vehicle that is operated on those roads.'

4.1.5 Public perception of the articulated vehicles is, in the main, driven by the reporting in the press, in general this is negative and should be balanced with the view that relative to the actual number of this vehicle in operation worldwide, the actual numbers of reported incidents on this vehicle type are relatively few.

5. BUS TRIAL RESEARCH

5.1 *Passenger Surveys*

5.1.1 Independent researchers travelled on both articulated and ordinary buses, completing a questionnaire designed to obtain passenger views. A 97% passenger response rate was achieved. The survey was designed to enable comparison with the results of a survey conducted in 2008, when a different methodology was adopted and approximately 2000 forms were distributed which received a response rate of approximately 15%.

5.1.2 During the course of the survey, 1000 questionnaires were completed. Of these, 650 were from regular bus passengers, split between the articulated and regular buses. The remainder of the surveys were completed by Castle Rushen and QE2 High School student passengers during school hours, using questionnaires distributed by teaching staff. A copy of the questionnaire is attached at Appendix 3.

5.1.3 As the survey results are from a sample of bus passengers, they are subject to random error variation. Although the sampling error will be different for each result obtained, we can be highly confident that any particular result will be within about 5 percentage points of the true figure and can reasonably assume that differences greater than 10 percentage points signify a real difference (i.e. a difference would be found if all passengers were interviewed).

5.2 *Passenger Survey Results – Fare Paying Passengers*

5.2.1 The survey identified little significant difference in the satisfaction levels of articulated buses when compared to the ordinary buses. 91% of articulated bus passengers were satisfied with the overall service, compared to 97% of ordinary bus passengers. Overall satisfaction levels compared favourably with the results of the 2008 passenger survey. The only difference greater than 10% was satisfaction with the smoothness of the journey: 94% for ordinary buses compared with 83% for articulated buses.

5.2.2 A copy of the survey results is attached at Appendix 4.

5.3 *Passenger Survey Results – Students*

5.3.1 Student passengers were requested to complete the questionnaire in relation to the articulated bus only, and the results demonstrate significantly different levels of satisfaction when compared to the regular, fare paying passengers. Only 62% of CRHS and 33% of QE2 student passengers were satisfied with the overall service.

5.3.2 The student survey results were no surprise to the IWG. During the course of the trial, the buses experienced higher levels of occupancy than the regular buses on the school routes, and a larger number of students were required to stand. The maximum number carried on one bus was 128 passengers on the QE2 route. The IWG was also aware that replacement of the double deck buses with articulated buses had a social impact; students were unable to occupy their “regular” seats. It is possible the required change in behaviour as a consequence of the articulated buses contributed to the negative student perceptions.

5.3.3 In addition, during the QE2 trial in particular, the articulated service suffered a number of mechanical breakdowns. The consequence of this was that student passengers were late arriving at school on several occasions, which also had a negative effect on overall satisfaction levels. Only 12% of QE2 student passengers and 36% of CRHS student passengers reported satisfaction with arrival at the destination on time.

5.3.4 Although 82% of CRHS passengers and 60% of QE2 student passengers were satisfied with the provision of grab rails etc., only 30% of CRHS and 26% of QE2 student passengers were satisfied with adequate provision for bags.

6. TRIAL FEEDBACK

6.1 *Schools Feedback*

6.1.1 Following the trial, both CRHS and QE2 staff were asked their views of the trial. The Head Teacher of CRHS reported that the trial had gone fairly neutrally, and that no specific child management issues had arisen during the course of the trial. He did however report the feedback received by the school of “not enough seats” and “nowhere to put school bags if pupils were holding on”.

6.2 *Public Feedback*

6.2.1 During the course of the trial, the IWG invited members of the public to submit their comments. A total of 56 letters and emails were received, 17 of which (30%) were negative comments regarding the QE2 route. The key themes evident in the public responses were as follows:

- the safety of the buses carrying standing children;
- whether the children were able to reach the grab handles;
- overhanging the pedestrian walkway;
- student passenger crowding;
- where to place the school bag/bags.

6.2.2 The large majority of comments were in relation to safety, and the late arrival at schools, an unfortunate consequence of the breakdowns.

6.3 *Articulated Bus Driver Feedback*

6.3.1 The IWG met with the drivers selected for the trial to ascertain their views. No significant concerns or issues were raised during the discussion.

6.4 *Emergency Services Feedback*

6.4.1 As part of the trial, the IWG sought the views of the emergency services. In particular, they sought their views regarding attendance at a road traffic accident involving a fully loaded articulated bus, and whether this would present any differences in comparison with an incident involving single or double deck vehicles. In order to formulate these views, the emergency services were invited to have a look around an articulated bus.

6.4.2 Ambulance Service

6.4.2.1 The Ambulance Service did not take up the invitation.

6.4.3 Isle of Man Constabulary

6.4.3.1 The Isle of Man Constabulary declined the invitation, considering it much more appropriate to refer the Independent Working Group to the Road Safety Department within Department of Infrastructure.

6.4.4 Fire Service

6.4.4.1 The feedback from the attending fire crews, which included two road traffic collision instructors, was that the construction and safety devices incorporated into the design of the vehicle did not present the Fire Service with any obstacle that they would not encounter in dealing with a more traditionally constructed passenger service vehicle, with perhaps the exception of the possible number of persons on the vehicle who may become casualties in the event that the vehicle was involved in an incident, although it was assumed that this would not be hugely different from a normal double deck bus.

6.4.4.2 In terms of accessibility for fire crews onto the vehicle it was noted that if necessary, the concertina area would provide another means of access to crews if the situation required it.

6.4.4.3 The only other concern raised was the routes that the articulated buses may be used on, as on some roads the length of the bus may make it difficult for emergency vehicles to pass it or may make it extremely difficult for the bus to pull in out of the way of emergency vehicles.

6.4.4.4 The Fire Service concluded that:

"In essence the crews did not find anything remarkable about the articulated bus and did not envisage its design causing them any greater issues in the event of an incident than they would normally expect with such a large vehicle."

6.5 *Risk of Fire*

- 6.5.1 Articulated buses have been used in other cities in the UK for some time and there have been incidences where fires have occurred. However, there is no empirical data available to indicate that Citaro G vehicles are any more likely to suffer a fire than any other bus type currently in use. Further background information regarding these fires can be found at Appendix 5.

7. SCHOOL TRANSPORT

- 7.1.1 The DCCL proposal regarding the introduction of articulated buses on the Isle of Man is for use on the school routes, which on a school day currently transport students free of charge on 48 buses.

7.2 *Free School Transport*

- 7.2.1 The history and current position regarding free school transport in the UK and the Isle of Man is as follows:

7.3 *United Kingdom*

- 7.3.1 In the UK, local authorities have a statutory responsibility for transporting children to school under 8 years old who live more than two miles from the school; and children over 8 years old who live more than 3 miles from the school.
- 7.3.2 This transport can be provided by a number of methods: school contract buses hired from private companies on which pupils travel only; local authority school buses; taxis, private hire cars and minibuses; and local bus services on which travel passes (tickets) are issued for children to use for travel to and from the school.

7.4 *Isle of Man*

- 7.4.1 Unlike the United Kingdom, the Isle of Man does not have legislation which places a statutory obligation to provide transport to and from school for pupils of any age.
- 7.4.2 Prior to 2000, students were required to contribute to the cost of school transport and there were restrictions on the distance students had to live from school to qualify for free or subsidised transport.
- 7.4.3 The requirement for free school transport was introduced as part of the 2000/01 budget, which introduced significant changes in the payment of child benefits. Free school transport was included within the budget package to assist lower paid citizens in transporting children to school.
- 7.4.4 Although the DCCL budget was increased at that time by £125,000 to accommodate the introduction of the school buses policy, a reduction in receipts of £150,000 was also budgeted for. The introduction of the schools policy in 2000/01 also required the immediate acquisition of 14 additional buses, which clearly had a significant financial impact.
- 7.4.5 There is no statutory obligation regarding the transportation of children to school placed on the Department of Education and Children; neither is there any

legislation in place which places a statutory obligation on the DCCL (as current bus operators), to provide a school transport scheme.

7.4.6 The Education Act 2001, which refers to school transport in Section 38, states:

- The Department may make arrangements for the provision transport and otherwise for the purpose of facilitating the attendance of pupils at schools or colleges;
- Arrangements under subsection(1) may require the making of such reasonable charges for the use by such pupils of any transport so provided as the Department, with the concurrence of Treasury, may determine.
- The Department may pay the reasonable travelling expenses of any pupil in attendance at any school or college for whose transport no arrangements are made under subsection(1)

7.4.7 School transportation provisions are currently made by the DCCL through timings of existing public service routes. Whilst buses on school routes display route destinations as "School Services", they are normal routine services which can pick up adults; this is not widely understood on the Isle of Man, where many of the general public assume that the "school services" are restricted to children.

7.4.8 It should also be noted that there is no statutory requirement for the carriage of school pupils to be free of charge.

7.4.9 Since the decision regarding the provision of free school transportation was agreed by Tynwald, a substantial part of DCCL's bus fleet is used for those services required during term time and for quite limited periods on those days. Consequently, the number of buses required relative to the total number of passengers is significantly reduced for 12 weeks each year.

7.5 *Seat Belts*

7.5.1 A further concern raised by political members during the Tynwald debate, and members of the public when commenting online and in the media, was the safety of school children standing on the articulated bus, and the issue of seatbelts.

7.5.2 It has been a requirement since 1997 in the UK that all coaches and minibuses are fitted with seatbelts "*whenever they were used specifically for the transport of children under 16*". In 2001 it became a requirement for all new coaches, minibuses and buses (except urban buses) to be fitted with seat belts.

7.5.3 In September 2006, new regulations came into force as a result of an EU Directive, which introduced the requirement for seat belts or child restraints for all seated occupants aged three years and above in all moving buses and coaches where they are available. The regulations also require passengers to be informed that wearing a seat belt is mandatory.

7.5.4 The effect of the legislation is to ensure that belts are fitted in coaches and minibuses used specifically by children, including for home-to-school transport. The minimum requirement is for a fitted lap belt, but does not preclude three-point belts if so desired. Scheduled bus services are excluded from this legislative requirement.

7.5.5 It is therefore not a requirement in the UK for a public bus used by fee paying passengers and or pupils travelling to and from school to be fitted with seatbelts. It should be noted that neither are there any restrictions for a public service bus carrying standing pupils other than the licensed standing capacity to and from school.

7.6 *School Safety/Accident figures*

7.6.1 General Trends

7.6.1.1 To obtain an understanding of how child safety is affected during travel to and from schools, initial research was undertaken to identify the availability of UK data regarding incident and accident figures for school children. Figures were obtained for Northern Ireland through its Department of the Environment (DOE)¹ and some figures were available for general child safety from the Department for Transport (DfT)². Unfortunately it was not possible to identify data which related specifically to children carried on articulated buses.

7.6.1.2 The Northern Ireland school accident figures identified those schoolchildren who travelled as pedestrians were most likely to be injured, followed by schoolchildren who travelled as car passengers. Schoolchildren who travelled as bus passengers ranked third most likely to be involved in an accident. It should be noted that Northern Ireland does not have a requirement for seatbelts on school buses and advice received from the DOE is that this sample was a mix of purely school buses and in-service buses.

7.6.1.3 Causal factors for those incidents were also investigated. Of the 91 children killed or seriously injured over the period, some 68% (62) were deemed to be the fault of the children involved. Full details of these school accident statistics can be found at Appendix 6.

7.6.2 Isle of Man School Accident Figures

7.6.2.1 As school bus transport to and from school falls outside the remit of The Department of Education and Children there are very few incidents reported directly to schools.

7.6.2.2 The Department of Education and Children is aware of and has noted a very small number of minor accidents that have occurred.

7.6.2.3 The type of injury that has been reported, has been minor grazing and bruising as a result of a slip or trip incident. In the small number of incidents noted this occurred whilst getting off the bus upon arrival at school.

7.6.2.4 Bus Vannin informally advised of a further incident that was reported involving a passenger of school age who slipped down the steps of a double deck bus and sustained a broken arm.

¹ Figures are taken from DOE Statistical Bulletin's on Home to School Travel – Pupil Road Casualty Statistics 2006 -2012 (March 2012); Data is from Police Service of Northern Ireland(PSNI) Road Traffic Collision Database

² Figures are from publicly available statistics on Reported Road Casualties, Great Britain available between 2005 and 2010 for all vehicle types and incidents. Reports are taken from DfT STATS 19 results.

7.6.2.5 Although the articulated bus driver training included an emergency stop at the DOI test centre, a fully-loaded emergency stop was not conducted as part of the 2013 Isle of Man trial for safety reasons. In the event of an emergency stop, articulated buses are fitted with more places for standing passengers to hold on than regular buses.

7.7 *Luggage Provisions*

7.7.1 Lack of room on the bus, and the provision of adequate facilities for bags were further issues raised during the trial by both student passengers and their parents. Both issues were considered by the IWG to be inter-related.

7.7.2 The IWG compared the luggage provision of the articulated bus with the standard Mercedes buses currently in use on the Isle of Man and noted no significant difference between the two bus types.

7.7.3 Furthermore, enquiries regarding the common practice of students travelling on buses identified that students do not use the luggage racks, but retain their bags with them during their journey.

7.7.4 As a consequence of this issue, the IWG agreed that if articulated buses be approved for use on the Isle of Man, it be recommended that Bus Vannin passenger route calculations provide for a maximum of between 100 and 120 student passengers on each bus journey, as opposed to the standard articulate bus passenger maximum number of 149. It was felt that the reduction in passenger numbers should accommodate the additional room required on the bus for school bags. See also the information regarding loadings in paragraph 8.6.5.2 on page 18.

7.8 *Student Behaviour/Supervision*

7.8.1 A further concern raised during the debate regarding articulated buses on school routes was in relation to student behaviour and the ability of the driver of such a vehicle to manage the behaviour of a large number of students.

7.8.2 The IWG noted that whilst bus drivers on the Isle of Man have no responsibility for the behaviour of student passengers, they have a responsibility for the safety of the passengers. Modern passenger vehicles are fitted with internal CCTV cameras as standard to address this responsibility.

7.8.3 Whilst student behaviour is out-with the remit of the IWG, best practice was noted in several areas including Durham, Devon and Cornwall, which have written and adopted Codes of Practice for buses to school, which outline the responsibility of the different parties. The IWG particularly noted the relatively simple yet comprehensive Code introduced by the States of Jersey which defines the responsibilities of students, bus drivers, schools and parents.

8. TECHNICAL ASSESSMENTS

8.1 *Risk Assessment – Passenger Vehicles*

8.1.1 Public risk in relation to road passenger vehicles is managed through the consideration of the interaction of the following three criteria:

- Vehicle Specification and Approvals
- Driver Competence
- Route Suitability

8.2 *Vehicle Specification and Approvals*

8.2.1 Every vehicle manufacturer must ensure that each vehicle produced is fit for purpose. This is ensured through the vehicles specification and approval process. Every vehicle used on the Isle of Man, regardless of the vehicle specification and approvals process, must comply with Isle of Man legislative requirements.

8.3 *Current UK Vehicle Approvals*

8.3.1 The Mercedes Citaro 0539G articulated bus trialled on the Island was tested and certificated in the United Kingdom prior to introduction there. This approval process was completed by the Vehicle Operator Services Agency (VOSA), an agency of the Department for Transport. Full details of the UK vehicle approvals process is attached at Appendix 7.

8.4 *Isle of Man Vehicle Approval Requirements*

8.4.1 A review has been completed by the DOI into the details of the legislative changes required to allow for the introduction of these vehicles onto the Island. In summary these are:

8.4.2 The DOI would seek Tynwald approval of the Road Vehicles (Construction and Use) (Amendment) Regulations under the provisions of section 74(1) and (2) of, and paragraph 1(1) of Schedule 2 to, the Road Traffic Act 1985.

8.4.3 These Regulations would amend:

- The Road Vehicles (Maintenance and Use) Regulations 2012; and
- The Road Vehicles (Construction, Equipment and Weights) Regulations 2012;

8.4.4 The changes would introduce the concept of articulated buses into Manx Legislation, defining the special characteristics of the vehicles.

8.4.5 The regime for testing and registering them would be consistent with other vehicle types and the proposed arrangements would also be broadly consistent with other jurisdictions.

8.5 *Driver Competence*

8.5.1 Bus and coach drivers are required to pass a comprehensive driving test. Currently the UK standard test comprises a theory test including hazard perception; and a practical driving assessment.

8.5.2 To obtain a PPV licence on the Isle of Man, bus and coach drivers are required to undergo an enhanced CRB check, and are also required to pass a medical examination every three years once over the age of 45 years.

- 8.5.3 Should approval be obtained to introduce articulated buses on the Isle of Man, the DOI would also seek Tynwald approval for the Driving Licences and Tests (Amendment) (No3) Regulations under section 74(1) and (2) of, and paragraphs 2 and 22(1) of Schedule 3 to, the Road Traffic Act 1985. These Regulations would amend:
- The Driving Licences and Tests Regulations 2007.
- 8.5.4 The introduction of these regulations would require a driver of an articulated vehicle to obtain an additional licence to that required for either a normal single or double deck vehicle, an additional licence requirement in the Isle of Man compared to the UK.
- 8.5.5 Additional to these legislative requirements, Bus Vannin has robust disciplinary and competence procedures. Under-performance is addressed in accordance with these procedures to ensure that all bus drivers meet the required competency standards.
- 8.5.6 Drivers selected by Bus Vannin to drive articulated buses would be required to demonstrate their competence by using similar selection criteria to those used by the major bus operators in the UK. That selection process would involve consideration of the following:
- Freedom from accidents/incidents
 - No adverse customer comments
 - A good attendance record
 - No live warnings or disciplinary awards
- 8.5.7 Drivers would also be fully trained to operate articulated buses.

8.6 *Route Suitability*

- 8.6.1 The suitability of using an articulated bus on a specific section of the highway network will be a function of the interaction of the weight and dimensions of the articulated bus and carriageway geometry. The maximum permissible weights and dimensions of vehicles in the Isle of Man are set out in the Road Vehicles (Maintenance and Use) Regulations 2012. In addition vehicles exceeding 14m in length or exceed a laden weight of 32,520kg are restricted to specific roads set out in Traffic Regulation Act 1985 Long or Heavy Vehicles (Designated Roads)(No.2) Order 2011.

8.6.2 A comparison of bus dimensions

<i>All dimensions in mm</i>	Mercedes Benz – Citaro G Articulated	Mercedes Benz – Citaro – Single Deck	DAF DB250 – Double Decker	Volvo B7 – Double Decker
Overall Length	17940	11950	9790	10679
Front overhang	2705	2705	2375	2531
Wheelbase(s)	5845 (front) 5990 (rear)	5845	5448	5700
Rear overhang	3400	3400	2375	2448
Overall width	2550	2550	2550	2550
Body turning circle	22800	24542	15900	18000
Swept path	7419	6758	NA	NA

8.6.3 Length

- 8.6.3.1 The maximum permissible length of a 3 axle articulated vehicle is 16.5m. The Citaro G articulated bus is 17.94m long, 5.95m longer than the existing Citaro G single decker bus and 1.44m longer than the maximum permissible length for an articulated vehicle. It should be noted that currently the Road Traffic Regulation Act 1985 Long or Heavy Vehicles (Designated Roads)(No.2) Order 2011 restricts vehicles over 14m in length to roads specified within Schedule 1 of the Order.
- 8.6.3.2 In practical terms an articulated bus would exceed the length of the majority of existing bus lay-bys and bus stop clear ways designed for a 12m or shorter bus. If the existing lay-bys are not converted the rear of an articulated bus would obstruct the adjacent traffic lane which may cause congestion and increase the risk of a collision. In addition if the existing lay-bys and bus stop clearways are not lengthened an articulated bus would not be able to correctly align with the kerb face therefore providing poor accessibility for passengers. Design guidance issued in the UK for example, Metro 'Bus stop infrastructure Standards' April 2008 & Transport for London 'Accessible bus stop design guidance' January 2006 both require a standard bus stop lay-by used by articulated buses to be 65m, an additional 12m more than required for a standard bus.
- 8.6.3.3 In addition to the cost of the remedial works required to bring the existing lay-bys and bus stop clearway markings up to accessible and safe standard, there will be also indirect costs associated with lengthening lay-bys and bus stop clearways such as the reduction in road space available for parking.
- 8.6.3.4 Other safety and performance impacts related to the length of articulated buses have been observed at junctions, railway crossings and more generally on single carriageway rural roads. The issues identified were the increased time that the articulated bus would take to clear a junction, execute a manoeuvre and to be overtaken. Also the articulated bus took longer to clear junctions and this was considered to cause a risk at traffic light controlled intersections where the time to clear the junction was likely to exceed typical "inter-green" times. This could present a hazard and increasing the "inter-green" time would reduce the capacity of the junction.

8.6.4 Turning Circle Requirement/Swept Path

- 8.6.4.1 To control the degree of cut in by the inside wheels of the vehicle when it is turning, articulated vehicles must conform to the turning circle requirement defined in Road Vehicles (Maintenance and Use) Regulations 2012. This requirement calls for the vehicle to be able to negotiate a circular corridor of 12.5m outer and 5.3m inner radii. This is a wall to wall requirement as no part of the vehicle must extend beyond the corridor during manoeuvre.
- 8.6.4.2 A Citaro G articulated bus has a 22.850m turning circle and complies with the outer radius regulation. However its 7.4m swept path exceeds the specified maximum articulated vehicle swept path of 7.2m. In comparison to the 12m Citaro rigid bus the articulated bus has a 0.661m larger swept path and a 1.82m larger turning circle.

- 8.6.4.3 The width of a two way road must be sufficient to accommodate the swept paths of two large vehicles (such as buses) passing in opposite directions. In addition, allowance must be made for safety margins between the two vehicles and between each vehicle and any vertical obstruction close to the carriageway edges. On straight sections of carriageway the width of swept paths is virtually the same as the width of the vehicles themselves (2.55m), plus the width of rear view mirrors.
- 8.6.4.4 Where there is substantial flow of traffic and the passing of other large vehicles travelling in the opposite direction is common, a standard 7.3m carriageway gives sufficient clearance between the vehicles themselves and also safe clearance from pedestrians and street furniture.
- 8.6.4.5 When traffic flows are light and large vehicles will meet infrequently a 6.0m carriageway (assuming there are no vertical obstructions within 0.5m of the carriageway edges) is the absolute minimum carriageway width which will allow the safe passage of large vehicles.
- 8.6.4.6 However, the swept path of a vehicle increases as it negotiates a bend therefore the combined swept paths two vehicles may exceed the available carriageway width. Therefore, longer vehicles with a correspondingly increased swept path will pose a greater risk to other road users at bends for a given road width.
- 8.6.4.7 Observations of the articulated bus during the test runs showed that the wider swept path of the articulated bus resulted in the articulated bus sitting closer to or over the centre line of the road as it negotiated minor bends on the route. This had the effect of forcing oncoming vehicles to take an avoiding manoeuvre. Elsewhere, when manoeuvring around tighter bends, typically at junctions, the articulated buses needed to cross more often the centre line of either the main or side road when compared to the 12m bus. The ability of the articulated bus to negotiate certain bends and junctions during the test run was a result of the articulated bus encountering little or no opposing traffic when undertaking the manoeuvre. If higher flows were to be encountered the risk of collisions and/or congestion would increase unless drivers of opposing vehicles are able to anticipate the potential conflict with the articulated bus and are able also to take appropriate avoiding action.
- 8.6.4.8 The wide swept path of articulated buses means that articulated buses have the potential to overhang the footways or adjacent traffic lanes by a significant margin when manoeuvring along narrow and bendy sections of road. Many footways are typically fairly narrow, 1.2m to 2.0m and there is a significant added risk of vehicles coming into conflict with pedestrians. During the test runs this was most clearly observed along Castle Street, Castletown and the junction of Queens Street/Farrants Way, Castletown.
- 8.6.4.9 It should be noted currently vehicles exceeding 14m cannot travel further south than the Airport. As such existing highway infrastructure beyond this point has not been modified to accommodate the regular use by vehicles exceeding 14.5m. From observations, certain junctions for example, Four Roads - Port St Mary, would need to be improved to safely accommodate an articulated bus.
- 8.6.4.10 In addition to reduce the risk of collisions at junctions or bends within town centres and residential areas consideration would need to be given to the removal of

parking sufficient to accommodate the manoeuvring of the articulated bus on the approaches to junctions or bends on the specified route.

8.6.5 Axle weight & Laden Weight

- 8.6.5.1 The maximum axle weight permissible on a 3 axle articulated vehicle is 10,170kg for the single driving axle of the articulated vehicle. The Citaro G articulated bus drive axle weight is 13,000kg this exceeds the maximum permissible weight by 2,830kg.
- 8.6.5.2 The maximum permissible total laden weight of an articulated vehicle with 3 axles is 24,390kg. The Citaro G articulated bus kerb weight is 17,020kg. The difference between the permissible total laden weight and kerb weight will determine the maximum number of passengers. The estimated maximum passenger capacity will be 113. If the bus was required to carry 150 passengers then assuming the same kerb weight the total laden weight would be approximately 26,770kg.
- 8.6.5.3 The high axle weight of the structural road wear attributable to vehicles is normally assumed to be proportional to the fourth power of the axle weight. Thus, a 10 per cent increase in axle weight is assumed to increase structural wear by 46 per cent.
- 8.6.5.4 Road pavement designs is based on the assumption that structural road wear is proportional to the fourth power of the axle load, research has shown that thick well-constructed fully flexible pavements do not weaken gradually through the effects of cumulative traffic loading but maintain their strength with time. For these pavements, the deterioration is not structural but generally occurs only at the surface. Provided that non-structural deterioration is detected and remedied before it has serious impacts on structural integrity, these pavements remain structurally serviceable for indeterminate periods without the need for any structural maintenance (i.e. maintenance is limited to the replacement of the wearing course at regular intervals and the underlying layers are "permanent").
- 8.6.5.5 A significant proportion of the road network specified in Schedule 1 of the Road Traffic Regulation Act 1985 Long or Heavy Vehicles (Designated Roads) (No.2) Order 2011 would be of this type, however the impact of the higher axle load of the articulated bus on the remaining road network especially residential roads would result in a proportional increase in damage to these roads.

8.6.6 Common Characteristics of UK articulated bus routes

- 8.6.6.1 A visual survey of selected bus routes within the UK (using Google Map- street view) where articulated buses are currently operating or were operating until recently: Cardiff – Bay Car; Cardiff – Capital City; Manchester – 135 Manchester to Bury; and York – 4Ftr (now withdrawn) indicated they shared a number of common characteristics: the routes were both intra and inter urban routes using the primary network. The routes are characterised by roads and junctions which are sufficiently wide to accommodate the swept path of the bus and kerbside parking was restricted to maintain uninterrupted two way traffic flow even within residential estates. In addition the bus stop infrastructure has been modified to allow the articulated vehicles to dock correctly.

8.7 *Cost of highway infrastructure and traffic signing works*

- 8.7.1 DCCL identified the Douglas to Port Erin/Port St Mary/ Castle Rushen High School route as the first route scheduled for conversion to articulated bus. Therefore this route was looked at in detail. It is estimated that the total cost of the necessary changes to the highway infrastructure to accommodate the Douglas to Port St Mary school bus is £604,500. The costs only include changes to the existing junctions, lay-bys and bus stop clearway's including the necessary traffic regulation orders necessary to accommodate an articulated bus. The estimate does not include any costs associated with diverting utilities or traffic management costs during works.
- 8.7.2 A financial appraisal for this route can be found attached at Appendix 8.

8.8 *Accident risk*

- 8.8.1 Concern has been raised regarding whether the introduction of articulated buses could result in an increase in road traffic accidents resulting in higher bus passengers or vulnerable road users (cyclist and pedestrians) casualties. Data on accidents involving articulated buses is scarce in both a UK and European context. The main source in the UK has been Transport for London.

8.8.2 *Passengers*

- 8.8.2.1 Between 2007 and 2011 there have been 24 bus passengers injured in collisions in the Isle of Man. Of these 20 were slightly injured, 4 were seriously injured.
- 8.8.2.2 The most at risk age group for casualties on buses are the 65s and older accounting for 45% of the reported casualties; age group 16 to 65 accounted for 37.5% of the reported casualties; and age group 16s and under accounted for 12.5% of reported casualties.
- 8.8.2.3 The highest number of casualties - 66.7%, was to passengers who were standing or moving within the bus at the time of the accident having boarded or were getting ready to alight. The most common contributory factor associated these casualties was the bus driver suddenly braking on the approach to or exit from a bus stop.
- 8.8.2.4 As outlined earlier, an articulated bus needs more road space, especially at bends, junctions and bus stops. This need for increased road space may increase the likelihood of driver of an articulated bus needing to react to oncoming vehicles, increasing the likelihood of sudden braking and therefore the risk of standing passengers or passengers moving within bus falling. It would be expected that improving the highway infrastructure to accommodate articulated buses would reduce the risk to bus passengers. Another additional measure that could reduce casualties specifically associated with manoeuvring in to and out of a bus stop would be to increase the dwell time of buses so that passengers did not have to move to or from their seats whilst the bus is in motion.

8.9 Risk to Pedestrians and Cyclists

8.9.1 General

- 8.9.1.1 Articulated buses have been in use for a number of years in many cities and urban areas around the world; these include, but are not limited to the Mercedes Citaro G that were in use in London.
- 8.9.1.2 It is difficult to assess the risks posed to pedestrians and cyclists on the Isle of Man using comparisons from these areas, not only due to the considerable differences in volume of pedestrian, cyclist, and vehicular traffic, but also the significantly different cultural backgrounds against which the data must be assessed.
- 8.9.1.3 It would seem that the introduction of the Citaro G initially increased the number of pedestrian and cyclist accidents in London, but in cities where the articulated buses have been in use for a substantial number of years, and where people comply with road usage requirements, the incidence of accidents is much less. Details of the experiences of Hamburg and Malta, where articulated buses are used, can be found at Appendix 9.

8.9.2 Risk to Cyclists

- 8.9.2.1 The risk to cyclists regarding the introduction of articulated vehicles was considered in relation to cycling accident data available for the UK, extracted from the Royal Society Prevention of Accident Reports for 2012.
- 8.9.2.2 Whilst it was noted that the most common vehicle involved in collisions with cyclists was cars or taxis, it would appear that heavy goods vehicles present a particular danger for cyclists, especially in London where around 20% of cyclist fatalities which occur involve an HGV, particularly when an HGV is turning left at a junction. About one quarter of accidents resulting in serious injury to a cyclist involved an HGV, bus or coach 'passing too close' to the rider.
- 8.9.2.3 It can be assumed that as the articulated buses were removed from the streets of London in 2011, (with the exception of the Olympic Games), the above accident figures regarding HGVs do not cover this type of vehicle. The issues could be said to be similar; however, many specialist cyclist public forums state that HGV's are different to articulated buses because in a HGV the driver sits higher and in general has a greater blind spot than articulated bus drivers.
- 8.9.2.4 Anecdotal evidence indicates that for the last 4 years of operation in London, 1 cyclist was killed in an articulated bus incident when some 40 were killed by HGV's. Further statistical analysis regarding the risk to cyclists can be found at Appendix 10.

8.9.3 Risk to Pedestrians

- 8.9.3.1 For pedestrians, figures were obtained from DfT which indicate over a number of years the pedestrian accidents caused by certain vehicle types.
- 8.9.3.2 The statistics for purely pedestrian incidents illustrate that there has been a reduction between 2008 and 2011 in all incidents with buses or coaches. There is

no evidence to show that this is due to the removal of articulated vehicles from London. Further details regarding the analysis of the pedestrian accident figures are contained within Appendix 6.

9. OTHER ISSUES

9.1 *Disability Issues*

9.1.1 One of the issues raised by the public was whether Articulated Buses would present particular issues for those with a disability; a specific issue raised was that articulated buses have more than one door which could create difficulties for the blind and those with restricted vision.

9.1.2 The IWG was assured that any articulated bus obtained for use on the Island would have to be fully compliant with current European legislation, and would load through the forward door. Should the introduction of articulated buses be progressed, a public information exercise would be required to ensure that this, and any other issue, was adequately explained to the travelling public.

10. CONCLUSION & RECOMMENDATIONS

10.1.1 In conclusion, having completed a preliminary review of the articulated bus trial and having assessed all of the freely available data and information, the IWG concludes that the DCCL proposal to introduce articulated type buses onto school services is driven purely by the financial pressures placed on the Department by the current economic climate.

10.1.2 The IWG considers that because of this pressure, the proposals to introduce articulated type buses onto school services have not been fully investigated and as a consequence, no adequate safety case or risk assessment has been completed. This should have been a priority as the IWG has found no evidence of this type of vehicle being used on this specific type of service, where it might carry up to 150 school pupils.

10.1.3 The vehicles have been trialled on Island roads on two occasions, demonstrating that the vehicles can be used on certain routes. During this recent trial the IWG has looked at some of the pertinent safety and infrastructure issues that have not previously been fully considered. These issues would need to be addressed to ensure that any introduction was both fully effective and the additional risks to other road users mitigated.

10.1.4 Having identified a number of safety and infrastructure issues on the trial routes an exercise was undertaken to complete a financial assessment of the infrastructure cost that would be required on a specific route. The return route from Douglas to Port Erin was assessed, taking in both the Airport and Castle Rushen High School. The IWG was informed that this would be the DCCL's first choice route for introduction of this vehicle type.

10.1.5 The majority of roads covered in this route are on the current Strategic Road Network and as such would be more suitable for the introduction of this vehicle type. The issues identified range from the length of the lay-by type and carriage

way bus stops, roundabout clearances, road junctions, traffic light timings, bus stop positioning, on road parking restrictions and the potential reduction of on road parking.

- 10.1.6 Many of these infrastructure issues already exist in respect of the current bus fleet operating on the Island.
- 10.1.7 The introduction of a vehicle with an additional 4 metres in length will only make the existing issues more apparent and increase the risk of a potential incident.
- 10.1.8 None of these conclusions or recommendations should be taken as to suggest that the IWG has found, seen or been provided with anything that would bring the competence or ability of the DCCL bus driving staff into question.
- 10.1.9 Where it was possible these infrastructure issues were assessed and for this route the DOI provided a minimum indicative cost of some £604,500. There are other areas within that costing that would need to be addressed for which a financial estimate cannot be made, such as compulsory purchase for road widening, or intangible costs, such as the removal of on road parking in some areas. An assessment was made of the potential infrastructure changes required within the High School premises and this indicated a potential cost of between £2000 and £5000
- 10.1.10 These indicative costs suggest that the DCCL financial case would not be viable if a holistic view of the cost implications to the IOM Government are taken into account. Whilst potentially providing DCCL a saving, the introduction of this vehicle type would not provide the overall savings to Government required by the Treasury.
- 10.1.11 This conclusion is based on the financial data provided by the DOI and the financial case provided by DCCL. The remaining High School routes on which the vehicles are proposed to operate have not been assessed due to time constraints.
- 10.1.12 Should the decision be to invest in the infrastructure changes then further work on the potential safety issues will be needed in order to provide assurance that the vehicles are safe for their intended purpose.
- 10.1.13 The IWG has not concluded that the vehicles are unsafe for their designed use as high capacity passenger carrying vehicles on high capacity routes, but that their introduction on specific school services may increase the current risk for standing pupils on school services.
- 10.1.14 However, should the decision be taken to accept the current DCCL proposals, thereby accepting the incomplete financial picture and the lack of safety case, the IWG suggest that prior to the purchase of the vehicles the following recommendations be considered:
- 10.1.15 Recommendation 1 – that DCCL commission a third party safety case for the carriage of school children on this vehicle type, including an assessment of the layout of the vehicles to maximise seated capacity whilst providing sufficient luggage capacity for the proposed services. This should include a full financial

assessment be made of the actual implications of any recommendations generated from the safety case, including any outcomes that may affect the maximum capacity of the vehicles.

10.1.16 Recommendation 2 – that DCCL work with both DOI and DEC to make a full and complete assessment of the infrastructure changes required to all of the routes that the vehicle would be introduced to, including changes required within school premises.

10.1.17 Recommendation 3 – that, having completed the work in 1 and 2 above, DCCL work with the Treasury to develop a full and complete business plan for the introduction of the vehicles fully addressing any recommendations from 1 and 2 prior to introduction.

Signed  **David Morter, Chairman**

Signed  **Brendan O'Friel, Independent Assessor**

Date 

APPENDIX 1

REPLACEMENT BUS STRATEGY

1. PROPOSAL

DCCL has proposed the use of articulated buses to Treasury to give an annual revenue saving of £300,000 and a bus replacement capital programme reduction of £3,000,000. The DCCL position is that DCCL has come under severe budget constraints which have effectively reduced the budget available by 15% per annum. In respect of Public Transport the Minister of Community Culture and Leisure has made it clear that the Department should cut costs before introducing charges for the more vulnerable groups such as pensioners and children.

As a result of the 2010 Bus Network Review and the consequential attention to the new network, the bus fleet has fallen from 90 to 74 vehicles. It is envisaged that over the next year this could be reduced to 70. The buses withdrawn only operated during the peak periods, mainly carrying schoolchildren, and these journeys have been consolidated into the service bus network. Despite this, eight secondary school journeys carry significant numbers of children and require two double deck buses to operate each journey (see Appendix 2). The purchase of 10 articulated buses would allow the withdrawal of 15 double deck buses, with 2 articulated buses being used as engineering spares. This would also save 8 bus drivers in the peak periods, as well as reducing fuel consumption. DCCL has been offered the opportunity to purchase Mercedes Citaro articulated buses that were operated in London. These vehicles are a version of the silver Citaro buses already in service on the Island.

The previous trial with the articulated bus was successful in terms of the bus achieving what was expected of it with drivers finding the buses to be much more manoeuvrable than expected. Similarly, the school children being asked to stand for around 15 minutes on journeys such as Castle Rushen to Port St Mary seemed to accept this without difficulty. The interior specification of the vehicle trialled left something to be desired and the lessons learned from this were incorporated in the interior design of the Mercedes Citaro single deck buses subsequently purchased new. The internal layout of those has proved entirely satisfactory and would be adopted in any articulated buses obtained for use here.

2. ARTICULATED (BENDY) BUSES OPTION

To aid efficiency and further reduce the fleet size DCCL is recommending the purchase of 8 second hand articulated buses, as have previously been trialled on the Island. Although there is likely to be some opposition to the use of articulated vehicles, there is also a requirement for a minor change to the Construction in Use Regulations by the Department of Infrastructure (already in place in UK), to enable them to be used on the highways of the Island. The change required involves the inclusion of a permitted "rear out throw" of 1.2 meters (EU standard for 18.5m artic). The out throw for a 12m rigid vehicle is 0.8m and that is in place already.

The problem with the Island operating articulated buses is believed to be one of perception rather than reality as the trials previously undertaken revealed no problems on the roads, in fact the artic's are more manoeuvrable than a 12m rigid vehicle.

Articulated buses will provide an effective solution to peak travel problems particularly short trip schools services where the buses can carry 150 passengers. This purchase forms a significant element of the Department "Savings" options as it will lead to a reduction of 6 or 7 vehicles in the fleet (from 71/72 to 65/66) and 4 FTE drivers. It is estimated that the full year on year savings are over £200k. The vehicles currently exist in numbers after London decided against using them. They are 8 years old and believed to be available at £45k - £50k each delivered to the Island. The Department would make sure that the buses purchased (if approved) will have been maintained by Mercedes and therefore can be confident on condition. The new replacement cost for an articulated bus is slightly less than the cost of a standard double deck bus.

The intention is to use the articulated buses mainly on short school trips where 1 can cover the requirements currently provided by 2 double decks. This will save on operating costs.

APPENDIX 2

ARTICULATED BUS INDEPENDENT WORKING GROUP TERMS OF REFERENCE

1. INTRODUCTION

The Department of Community Culture & Leisure has proposed the use of articulated buses to Treasury to generate annual revenue saving of £300,000 and a bus replacement capital programme reduction of £3,000,000. The Department's position is that Community Culture and Leisure has come under severe budget constraints which have effectively reduced the budget available by 15% per annum. In respect of Public Transport the Minister of Community Culture and Leisure has made it clear that the Department should cut costs before introducing charges for the more vulnerable groups such as pensioners and children. The Department of Infrastructure does not support the introduction of articulated buses on the Isle of Man, stating that the vehicles are out of keeping with the scale of road infrastructure on the Island and bring a range of safety, congestion and associated indirect costs as well as practical issues and direct costs not included within the business case. To assess the suitability of articulated buses for use on the roads in the Isle of Man, a further trial is to be undertaken, and a paper submitted by the Department to the Council of Ministers

2. CONSTITUTION

The independent working group has been established to oversee the 2013 trial to ensure that all appropriate issues are identified, incorporated and considered. The scope of the working group will include bus trial key user groups; evaluation criteria; data collection and review. The independent assessor for the trial will provide oversight to the work of the group, together with undertaking a review of the DCCL risk assessment assurance.

3. MEMBERSHIP

Mr David Morter, Department of Economic Development (Chairman)
Mr Brendan O'Friel, TravelWatch Isle of Man, Independent Assessor
Mr Michael Cartwright, Head of Operations, Department of Community Culture & Leisure
Mr Kevin Almond, Traffic and Safety Manager, Department of Infrastructure
Mr Peter Hannay, Economic Affairs, Treasury
Mr Adrian Mooney, Department of Education and Children
Ms Sian Christian, Corporate Services Manager, Department of Community, Culture & Leisure

4. MEETINGS

It is anticipated that five meetings of the independent working group will be required, to be scheduled prior, during and following completion of the trial. Further meetings will be scheduled as required.

5. METHODOLOGY

Identification of key trial user groups, approval of evaluation criteria and data collection methodologies, evaluation processes and feedback mechanisms.

6. OUTPUTS

- (i) identification of issues of concern regarding the use of articulated buses on the Isle of Man;
- (ii) identification and collection of evidence in relation to issues of concern;
- (iii) review of proposed mitigating actions and assurance.
- (iv) cost/benefit analysis, based upon infrastructural changes required to accommodate introduction of articulated buses on the selected routes.

APPENDIX 3

ARTICULATED BUS TRIAL SURVEY 2013

Gender 1. (Male) 2. (Female)

Age.....

Q1. How many journeys have you made on one of the “bendy buses” since the trial began (on Monday 18th February 2013)?

Please answer the following questions by reference to your most recent journey on a “bendy bus” during the trial period:-

- Q2. Did the bus arrive at your boarding point on time? 1. Yes 2. No
- Q3. Was the bus easy to get on and off? 1. Yes 2. No
- Q4. Did the bus arrive at your destination on time? 1. Yes 2. No
- Q5. Was the temperature inside the bus comfortable? 1. Yes 2. No
- Q6. Was a seat available for your journey? 1. Yes 2. No
- Q7. Did you sit or stand for the journey? 1. Sat 2. Stood 3. Both
- Q8. Was there adequate space for your bags? 1. Yes 2. No 3. Didn't have any bags

In light of your experience using “bendy buses” during this trial period, what do you think of:-

- Q9. The time the buses spend at stops whilst passengers get on and off 1. Very Good 2. Good 3. Adequate 4. Poor
- Q10. The time the buses take to complete their journey 1. Very Good 2. Good 3. Adequate 4. Poor
- Q11. Personal safety and security whilst travelling 1. Very Good 2. Good 3. Adequate 4. Poor
- Q12. Provision of grab rails/poles etc. to stand/move within the bus 1. Very Good 2. Good 3. Adequate 4. Poor
- Q13. Smoothness/freedom from jolting during the journey 1. Very Good 2. Good 3. Adequate 4. Poor
- Q14. Overall, how would you rate travelling on the “bendy buses” 1. Very Good 2. Good 3. Adequate 4. Poor
- Q15. Please use the space below to record any further comments you would like to make in relation to your experience of travelling on the “bendy buses” during this trial period:-

THANK YOU VERY MUCH FOR TAKING THE TIME TO COMPLETE THIS SURVEY

APPENDIX 4

BUS SURVEY RESULTS – Adults

	<i>Ordinary bus 2013</i>	<i>Bendy-bus 2013</i>	<i>2008 survey</i>
Easy to board and alight	99	97	94
Satisfied with personal safety and security whilst travelling	99	97	93
Satisfied with provision of grab rails etc.	99	99	N/A
Seat available for journey	98	100	97
Sat during journey	98	99	N/A
Satisfied with length of time buses take to complete journey	97	92	96
Satisfied with overall service	97	91	N/A
Satisfied with time buses at stops whilst passengers get on and off	95	97	93
Satisfied with smoothness of journey	94	83	N/A
Bus arrived at destination on time	88	73	79
Temperature inside bus comfortable	87	82	85
Bus arrived at boarding point on time	83	77	79
Adequate space for bags	63	67	N/A

BUS SURVEY RESULTS - Children

	<i>Castle Rushen High School</i>	<i>QEII High School</i>
Satisfied with time buses at stops whilst passengers get on and off	85	66
Satisfied with provision of grab rails etc.	82	60
Temperature inside bus comfortable	71	51
Satisfied with personal safety and security whilst travelling	70	49
Satisfied with smoothness of journey	67	46
Satisfied with length of time buses take to complete journey	63	42
Satisfied with overall service	62	33
Easy to board and alight	52	43
Bus arrived at boarding point on time	40	20
Bus arrived at destination on time	36	12
Adequate space for bags	36	26
Seat available for journey	27	24
Sat during journey	18	21

BUS SURVEY RESULTS - Comments

	<i>Passengers - non bendy bus</i>	<i>%</i>	<i>Passengers - bendy bus</i>	<i>%</i>	<i>Total</i>	<i>%</i>
Temperature - Too Warm/Too Cold	39	11.2	23	7.3	62	9.4
Drivers - consistency of ride & schedule dependent on driver	30	8.6	9	2.9	39	5.9
Timing - Late/early/not accurate/not on time	20	5.8	10	3.2	30	4.5
Poor road condition	12	3.5	9	2.9	21	3.2
Drivers - poor attitude	11	3.2	4	1.3	15	2.3
More bag / luggage space required	11	3.2	2	0.6	13	2.0
Articulated bus too bumpy / bouncy	0	0.0	13	4.1	13	2.0
Request for additional bus services on certain routes	11	3.2	0	0.0	11	1.7
Timetable - happy with / not happy with	4	1.2	3	1.0	7	1.1
Drivers - drive too fast	3	0.9	2	0.6	5	0.8
Not comfortable	1	0.3	4	1.3	5	0.8
Why no seatbelts	1	0.3	3	1.0	4	0.6
Overcrowded / underused service	3	0.9	0	0.0	3	0.5
Journeys expensive	3	0.9	0	0.0	3	0.5
School children take up too many seats	3	0.9	0	0.0	3	0.5
Cleanliness of buses	2	0.6	1	0.3	3	0.5
Not in agreement with bendy bus use on school routes / school children standing	1	0.3	2	0.6	3	0.5
Drivers - bus pulls away before passengers are seated	2	0.6	0	0.0	2	0.3
Don't want bendy buses	2	0.6	0	0.0	2	0.3
Uncomfortable seat	1	0.3	1	0.3	2	0.3
Bus didn't arrive	1	0.3	1	0.3	2	0.3
Display timetables at more bus stops	1	0.3	1	0.3	2	0.3
Concern for other road users re articulated buses	0	0.0	2	0.6	2	0.3
Poor management	1	0.3	0	0.0	1	0.2
Timetable - routes not accurately described	1	0.3	0	0.0	1	0.2
Request to park nearer pavement as ramp not always lowered	1	0.3	0	0.0	1	0.2
Bus pass appreciated	1	0.3	0	0.0	1	0.2
No more strikes / service great if not on strike	1	0.3	0	0.0	1	0.2
Shelter required at Lord Street	1	0.3	0	0.0	1	0.2
Total comments	168		90		258	

APPENDIX 5

Fire Risk

The initial introduction of the Citaro G with Transport for London (TfL) was subject to a number of vehicle fires leading to the removal of the fleet for modifications in early 2004. It was identified by Evobus that the fires were caused by a faulty hose used within the engine compartment. This fault was identified on all TfL Mercedes vehicles including some 150 Citaro's of which 130 were the 'G' variant.

The total fleet was inspected by qualified technical engineers with the addition that specialised fire suppression equipment was fitted within the engine compartment. The three fires leading up to the withdrawal of the vehicles were investigated by members of the London Fire Brigade and the DfT Vehicle Inspectorate.

The vehicles were re-introduced into use once the repairs were completed. Further fires occurred in the vehicles in 2007, when a bus caught fire due to a fault in the vehicles heating system, and a further fire occurred in 2010 outside Victoria Station when an empty bus caught fire; speculation at this time was that this fire may have been caused deliberately.

A TfL spokesman indicated that fires on Citaro G vehicles were, after the initial issues were dealt with, no more likely than with any other bus type in use.

The Citaro G vehicles proposed for use on the Island were introduced into use on Malta in July of 2011; since that time there have been a number of fires in the engine compartment of the vehicles. It has not been possible to obtain information as to the reasons behind these fires, apart that in one instance the fire was caused by leaking diesel fuel, but there is anecdotal evidence indicating that these incidences may be due to poor maintenance procedures rather than by design.

APPENDIX 6

Accident Figures

The Northern Ireland (NI) statistics for 2006-2010 show that some 310,000 children travel to and from school every day in the province and these figures were collated from the Police Service of Northern Ireland road traffic collision database.

The main findings of this report indicate that for the period five pupils were killed, 86 seriously injured and 685 slightly injured. Of the 91 pupils killed or seriously injured (KSI) 31 were aged 4-11 and 60 were aged between 12-18 years.

Pupils aged 4-18 injured whilst travelling to or from school by severity and mode of travel (2006-2010)												
Mode of Travel	Aged 4-11				Aged 12-18				Aged 4-18			
	Killed	Seriously injured	Slightly injured	All casualties	Killed	Seriously injured	Slightly injured	All casualties	Killed	Seriously injured	Slightly injured	All casualties
Pedestrians	1	21	82	104	2	42	146	190	3	63	228	294
Passengers of cars	0	4	129	133	1	8	137	146	1	12	266	279
Coach, Bus or Minibus passengers	0	5	40	45	1	2	111	114	1	7	151	159
Others ¹	0	0	5	5	0	4	35	39	0	4	40	44
All modes	1	30	256	287	4	56	429	489	5	86	685	776

¹Others includes pedal cycle, motorcycle, invalid/ 3 wheeler, taxi (hackney type), motor caravan, tractor, other motor vehicle, car/bus drivers, HGV's ridden horses and other non motor vehicle.

As can be seen from the figures above, the activity that has the largest incidence of injury is that of walking to school at 18.94%, closely followed by car travel at 17.98% and then bus travel at 10.24%.

To allow a clearer picture the figures for number travelling over the period have been extrapolated and show that of the sample taken (some 1000 students per year) 23.6% of students walked, 33.5% took a bus and 40.6% were driven in a car.

Where the pupil was recorded as being responsible for the collision, the principal causal factors involved were 'heedless of traffic crossing carriageway' and 'walk/run movement masked'. There is no indication given as to the bus incidences.

It has not been possible to find similar figures or information for the United Kingdom. However, it has been possible to find figures which indicate the number of vehicles in reported personal injury accidents for 2005 – 2008. These contain figures for accidents/incidents whilst taking pupils to/from school and pupils riding to/from school. As this includes the time period when articulated buses were in use in London, the figures may include some relevant data, but the detail is not known.

The statistics for pupils riding to/from school over the period report a total of 4,523 instances where a pupil was injured in a vehicle whilst travelling to/from school. Of this total 34 of these instances were whilst on a coach or a bus; 0.75% of the total.

Journey Purpose	Pedal cycles		Motorcycle		Cars		Buses or coaches		Light goods vehicles		Heavy goods vehicles		All Vehicles ¹
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Pupil riding to/from school 2005	619	49.60	174	13.94	429	34.38	8	0.64	10	0.80	4	0.32	1,248
Pupil riding to/from school 2006	571	52.34	192	17.60	311	28.51	7	0.64	2	0.18	4	0.37	1,091
Pupil riding to/from school 2007	571	54.90	174	16.73	274	26.35	9	0.87	6	0.58	4	0.38	1,040
Pupil riding to/from school 2008	633	55.33	181	15.82	308	26.92	10	0.87	6	0.52	1	0.09	1,144
	2,394	52.93	721	15.94	1,322	29.23	34	0.75	24	0.53	13	0.29	4,523

¹ Includes other vehicle types and cases where vehicle type was not reported

The figures shown are those purely for incidences of accidents for pupils travelling to and from school have been extracted from the overall personal injury figures for all cases and all types of vehicles. In order to take a more holistic view of the incident occurrences, the pupils riding to/from school figures can also be included within the overall numbers. In this case there were some 1,360.865 reported incidences of vehicles involved in accidents where personal injuries occurred. Buses or coaches accounted for some 26,055 incidents, which equates to some 2.65% of the total and overall the incidences of pupils riding to and from school equates to approximately 0.0025% of the incidents.

APPENDIX 7

CURRENT UK APPROVALS PROCESS

The Public Passenger Vehicles Act 1981 (the 'Act') requires under Section 6 that any public passenger vehicle which carried more than 8 passengers shall not be used on UK roads unless it has been examined and issued with either:

- a) a Certificate of Initial Fitness; or
- b) a Type Approval Certificate issued under Section 10 of the Act; or
- c) a Certificate issued under either Section 47 of the Road Traffic Act 1972 or Sections 55 to 58 of the Road Traffic Act 1988.

The Citaro 0539G which was used for the trial had been issued with a Type Approval Certificate (0164) under Section 10 of the Act and each individual vehicle has been issued with a Certificate of Conformity after inspection to ensure that it complies with the type approval certification.

In order to be issued with this certification a vehicle must be inspected and comply with the requirements set out in The Public Service Vehicles (Conditions of fitness, Equipment, Use and Certification) Regulations 1981. These set out the specific requirements for all PSV's for use on UK roads in Part II Regulations 6 to 34.

Articulated buses, under Regulation 5(2) are not required to comply with the requirements as set out in the regulations, but must comply with a) the specific regulations laid out in Schedule III of the Regulations; and b) paragraph 5 of ECE Regulation 36.

The regulations that are dis-applied for articulated buses are those that would be difficult to comply with due to their very specific nature, however, compliance with the requirements of ECE Regulation 36 ensure that the overall requirements for approval of this type of vehicle are no less stringent than those required under the UK's 1981 Regulations.

It should be noted that a new Mercedes Citaro G for use on roads in the United Kingdom would have to be issued with a 'European Community Whole Vehicle Type Approval' and as such would be checked against the same standards.

APPENDIX 8

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APPENDIX 8

Castle Rushen High School –Infrastructure Cost Assessment.

Arbory Road
Castletown
IM9 1RE

Existing:

Bus pick up and drop off is currently provided within the school grounds by means of a 'horse shoe' shaped bus lay-by. Person/vehicle segregation is by way of pedestrian railings with openings to allow access on/off waiting buses. These access points have been positioned to suit the existing bus stock.

Potential Works:

It is thought that the only works required will involve revisions to the existing pedestrian railings to reposition the access openings such that they suit the proposed buses. This will include:

- Mark out required access/egress positions
- Remove (where necessary) fixed barrier panels and posts
- Make good redundant post holes
- Excavate new post holes
- Set out new/altered to suit, posts and panels (new work to be painted to match existing)
- Concrete in posts
- Make good tarmac to footpath
- Infill old remaining access points with newly fabricated and painted barrier panels
- Touch up damaged paint work

Potential Costs: Approximately £2,000 - £5,000

Potential Residual Hazards: None currently envisaged.

APPENDIX 9

USE OF ARTICULATED PASSENGER VEHICLES – HAMBURG AND MALTA

Articulated buses have been in use for a number of years in many cities and urban areas around the world; these include, but are not limited to the Mercedes Citaro 530G that were in use in London.

In attempting to assess the risk posed to pedestrians and cyclists from this type of vehicle it has to be recognised that assessment of the potential use in the Island against the use in Central London that cannot be directly comparable due to the difference in pedestrian numbers encountered.

It does seem that the introduction of the Citaro G did initially increase the number of pedestrian and cyclist accidents in London, but in cities where the vehicles have been in use for a substantial number of years the incidence of accidents is much less.

A number of European cities were investigated such as Hamburg where not only are articulated vehicles used, but also bi-articulated vehicles which are even longer. The road network in and around Hamburg consists of all types, from large European style boulevards to small narrow single width roadways in urban and suburban areas, where there is little or no restriction to the use of the articulated buses. The Hamburg Transport Association (HVV) operates almost all of the public transport in and around Hamburg although there are some individual operators who also use all vehicle types.

The bus routes entering the centre of Hamburg generally fall into four categories; "MetroBus" and "SchnellBus". "MetroBus" services are high-frequency, metro-style services operated mainly by high-capacity bendy buses with three or four doors. "SchnellBus" services are limited stop, generally linking outlying districts with the city centre. Standard single decks were the usual vehicle type on these services, however certain routes did use articulated vehicles. In addition to these two main types of route the general Stadt- und Regionalbusse networks also utilise articulated vehicles.

Contact was made by the Chairman with HVV to discuss the issue of pedestrian accidents and the press officer noted that "here in Hamburg, pedestrians, cyclists and bendy buses seem to co-exist peacefully with there being no more incidents with any specific bus type over another."

Unfortunately there were no figures available for accidents or incidents from HVV, but they believe that the numbers would be significantly less than that experienced in London for a comparable number of route miles. (It should be noted that Hamburg is a city of 1.8 million people, but operates some 600 bus routes, some with 2 minute timings between vehicles). When asked as to why this might be the press officer commented

"in Germany in general the people are much more used to complying with road usage requirements, people only cross busy streets at crossing and only when the lights permit them to. Vehicles also stop at red lights and only park in areas provided. Our bus drivers are well trained and have used the vehicles regularly. We also have a significant network of specific cycle ways within the city centre which reduces the issues, but outside of the city centre road manners are very good".

This would seem to indicate that in a city where various articulated vehicle types have been in use for a considerable amount of time, these vehicles are treated no differently than a 'normal' single deck vehicle and the numbers of incidents per vehicle mile are comparable.

The Island of Malta has recently introduced articulated vehicles on some of its routes and there have been incidences of both pedestrian and cyclist accidents. However, in looking at the cause of those reported it would appear that the greatest problem with the vehicles in Malta is the standard of bus driver. One accident with a cyclist has resulted in a bus driver being charged with dangerous driving.

It would appear that in relation to pedestrians and cyclists the articulated type of vehicle is no different from any other type of vehicle on the road and on the condition that the individual is aware then it is unlikely that incidences of accidents will not be any greater. This assumes that pedestrians and cyclists abide by the rules of the road and act responsibly.

APPENDIX 10

Risk to Cyclists

In collisions involving a bicycle and another vehicle, the most common key contributory factor recorded by the police is 'failed to look properly' by either the driver or rider, especially at junctions. 'Failed to look properly' was attributed to the car driver in 57% of serious collisions and to the cyclist in 43% of serious collisions at junctions.

Other common contributory factors attributed to drivers are 'poor turn/manoeuvre' (in 17% of serious accidents involving a cyclist) and 'careless, reckless, in a hurry (17%)'. Cyclists are more likely to suffer serious injuries when a driver is judged to be 'impaired by alcohol', 'exceeding the speed limit' or 'travelling too fast for the conditions'.

The second most common contributory factor attributed to cyclists was 'cyclist entering the road from the pavement' (including when a cyclist crosses the road at a pedestrian crossing), which was recorded in about 20% serious collisions (and over one third of serious collisions involving child cyclists).

The most common vehicle involved in collisions with cyclists is a car or taxi, with the rider usually being hit by the front of the vehicle. In a quarter of fatal cyclist accidents, the front of the vehicle hit the rear of the bicycle.

Common Cycling Accidents

- Motorist emerging into path of cyclist
- Motorist turning across path of cyclist
- Cyclist riding into the path of a motor vehicle, often riding off a pavement
- Cyclist and motorist going straight ahead
- Cyclist turning right from a major road and from a minor road
- Child cyclist playing or riding too fast

This data is taken from the ROSPA report for 2012 and contains information taken from DfT figures for the UK.

DfT information, in its Road Accident Statistics Factsheet No.4 (2010), shows that in 2008 (mid way through articulated bus use in London) there were a total of 170,591 reported personal injury road accidents in the UK, 16,585 of these – around 10 per cent – involved at least one pedal cyclist, and in total; 115 cyclists were killed (5 per cent of total road accident fatalities in 2008); 2,450 were seriously injured (9 per cent of the total seriously injured); and 13,732 were slightly injured (7 per cent of all slight injuries).

However, the DfT further outlines that most reported accidents (93 per cent) involving pedal cycles involve two vehicles (the pedal cycle and one other). In comparison, 59 per cent of all accidents involve two vehicles. This may reflect the fact that accidents involving only a pedal cyclist are less likely to become known to police than other types of accident. Pedal cycle accidents have an average of 1.04 casualties per accident (compared with 1.35 for all accidents), and 95 per cent of the casualties resulting from a pedal cyclist accident are pedal cyclists.

In general when looking at the vehicles involved with cyclist accidents DfT reports, for 2008:

	Accidents		Pedal cyclist casualties			All severities	Percentage killed	Percentage KSI
	Number	Percent	Killed	Serious	Slight			
Single vehicle accidents	617	4	8	146	280	434	1.8	35.5
with pedestrian	381	2	8	143	233	384	2.1	39.3
with no pedestrian	236	1	0	3	47	50	0.0	6.0
Two vehicle accidents	15,462	93	89	2,183	13,019	15,291	0.6	14.9
with other pedal cycle	80	0	0	30	70	100	0.0	30.0
with motorcycle	280	2	0	25	201	226	0.0	11.1
with car	13,272	80	52	1,813	11,308	13,173	0.4	14.2
with bus or coach	381	2	6	56	292	354	1.7	17.5
with LGV	863	5	5	133	720	858	0.6	16.1
with HGV	341	2	24	81	235	340	7.1	30.9
with other vehicle	238	1	2	44	187	233	0.9	19.7
Three or more vehicles	506	3	18	121	433	572	3.1	24.3
All pedal cycle accidents	16,585	100	115	2,450	13,732	16,297	0.7	15.7

This outlines that in 2008, 2% of all cyclist incidents involved a bus or coach, with 1.7% of that 2% killed and 15.8% seriously injured.

For 2011 DfT figures show, for Cyclists the following:

	Accidents		Pedal Cyclist casualties		Percentage	Percentage
	Number	Percent	Killed	Serious	Killed	Serious
Single Vehicle Accident	945	4.81%	14	246	13.08%	7.98%
with pedestrian	369	1.88%	14	225	13.08%	7.30%
with no pedestrian	576	2.93%	0	21	0.00%	0.68%
Two Vehicle accidents	18,153	92.42%	75	2,695	70.09%	87.41%
with other cyclist	86	0.44%	1	26	0.93%	0.84%
with motorcycle	329	1.67%	2	43	1.87%	1.39%
with car	15,626	79.55%	43	2,231	40.19%	72.36%
with bus or coach	421	2.14%	1	69	0.93%	2.24%
with LGV	1,185	6.03%	7	200	6.54%	6.49%
with HGV	350	1.78%	19	94	17.76%	3.05%
with other vehicle	156	0.79%	2	32	1.87%	1.04%
Three or more vehicles	544	2.77%	18	142	16.82%	4.61%
all pedal cyclist accidents	19,642	100%	107	3,083	1%	16%

There are no real conclusions to be drawn from this data. It shows that for incidents with buses there has been a reduction in deaths but a corresponding increase in serious injuries over the period, it is highly doubtful that this can be attributed to the removal of articulated buses from London.

Pedestrian Accident Figures

DfT figures show that in 2008, in Great Britain there were a total of 182,155 personal injury road accidents. 29,128 of these – around 1 in every 6 – involved a pedestrian, and in total; 646 pedestrians were killed (22 per cent of the total road accident fatalities); 6,278 were

seriously injured (23 per cent of all seriously injured casualties); and 23,267 were slightly injured (11 per cent of all slightly injured casualties).

Statistics show that 70% of vehicles that hit and injured a pedestrian had a male driver (around two thirds of all drivers involved in accidents are male). In around 1 in 5 cases the driver was aged 25 or under, but only 5% of cases involved a driver aged 70 or over.

Most pedestrian casualties were hit by vehicles recorded as 'going ahead' (63%, rising to 73% for killed or seriously injured pedestrians). Vehicles in accidents with a pedestrian casualty were 4 times more likely to have been recorded as being on the footway than vehicles involved in other accidents - but still only account for 3% of vehicles involved in pedestrian accidents.

In total, more than half (57%) of pedestrian casualties were crossing the road (not masked by a stationary vehicle) when injured. *Of these*, 18% were on a pedestrian crossing and a further 12% within 50 metres of one. Of the remaining 43% of casualties; 14% were masked by a stationary vehicle; 10% were in the carriageway but not crossing; and 10% were on the pavement or verge.

Details of factors contributing to injury accidents are recorded by the police. Whilst it is not possible to determine blame from these contributory factors they may offer some insight into common types of accident; in 55% of accidents contributory factors were only assigned to pedestrians (with *pedestrian failed to look properly* being the most common individual factor); in 21% of accidents factors were only associated with vehicles involved (*with failed to look properly* being the most common vehicle factor, as in all accidents); in the remaining 24% of accidents at least one factor was assigned to both a pedestrian casualty and a vehicle (with the most common combination being both participants failing to look properly, recorded in around 7% of all pedestrian accidents).

For 2008, DfT statistics show the following:

	Single vehicle accidents with pedestrian casualties								Number of accidents
	Fatal		Serious		Slight		All severities		Proportion of acc. involving vehicle that are fatal
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	
Pedal cycle	3	1	48	1	142	1	193	1	1.6
Motorcycle	28	5	240	4	748	4	1,016	4	2.8
Car	336	63	4,360	76	16,490	78	21,186	77	1.6
Bus or coach	42	8	319	6	1,141	5	1,502	5	2.8
LGV	40	7	296	5	1,056	5	1,392	5	2.9
HGV	66	12	137	2	334	2	537	2	12.3
Any vehicle	537	100	5,731	100	21,134	100	27,402	100	2.0

This outlines that in 2008, 1502 incidents occurred between buses and pedestrians across the UK resulting in 42 fatalities and 319 serious injuries.

Comparable figures for 2011 show:

	Fatal	Per	Serious	Per	Slight	Per	Number of accidents All Severities	Per
	No.	Cent	No.	Cent	No.	Cent	No.	Cent
Single vehicle accidents								
Pedal cycle	2	1%	99	2%	268	1%	369	2%
All motorcycles	18	5%	177	4%	644	4%	839	4%
Car	256	66%	4,028	80%	14,971	81%	19,255	81%
Bus or coach	34	9%	245	5%	946	5%	1,225	5%
Van / Light goods vehicle	28	7%	281	6%	972	5%	1,281	5%
Heavy goods vehicle	33	9%	110	2%	244	1%	387	2%
Mobility scooter	0	0%	2	0%	3	0%	5	0%
Other vehicle	13	3%	80	2%	260	1%	353	1%
Any vehicle ¹	385	100%	5,046	100%	18,380	100%	23,811	100%

¹ Includes cases where vehicle type was not reported.

Telephone: 020 7944 6595

Source: DfT STATS19

Email: roadacc.stats@dft.gsi.gov.uk

Last updated:
27 September 2012

The figures in this table are National Statistics