Derbyshire County Council

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Car ownership

Traffic Collisions in Derbyshire:
Car Drivers over the age of 60

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County Council

Introduction

In 2014 Derbyshire County Council developed a bespoke customer segmentation model based on a classification tool produced by Hull City Council in partnership with the Local Government Association (LGA). The model was developed with support from Quantum Insight Consulting whose staff had worked on the original Hull model.

Customer segmentation allows the authority to anticipate and manage customer need. Understanding that different customers have diverse service needs ensures the authority can allocate resources accordingly. The model segments the population of Derbyshire into 4 super clusters and then into 18 sub clusters. These have been determined using 64 key socio and demographic statistics, largely from the 2011 Census. This Census data used was at output area level, the smallest statistical geography available, enabling extremely detailed analysis of demographic trends and service use. A more detailed description of the method used to produce the customer segmentation model is provided as Appendix A. Appendix B shows the descriptions of the different sub clusters.

This report presents analysis of traffic collisions by car and taxi drivers aged 60 or over and living within Derbyshire. Using the customer segmentation model the report identifies those drivers who are most likely to be involved in a collision and highlights the key characteristics of collisions for that group. The report then identifies potential ways to contact these drivers for publicity and educational campaigns.

Collision by sub cluster

Analysis of collisions involving drivers age 60 or over used pooled data of all road collisions in Derbyshire over the period 2012-15. Initial analysis focused on where collisions involving drivers over the age of 60 had taken place over this period, the results of which are shown in Figure 1. The key locations highlighted were in sub cluster 302, a sub cluster that is primarily found in the centre of towns, and in sub clusters 101, 102 and 103, which cover the most rural areas in the county. However, this analysis does explain not where drivers come from, only where they are likely to be involved in a collision.

Figure 2 shows analysis of collisions involving drivers aged 60 or over by driver postcode. Not all collision records contained full driver details, so this analysis drew from a smaller sample size than the collision location analysis. 1438 collisions were identified involving drivers aged 60 or over, whilst only 907 had full postcode details of the driver, enabling analysis using the customer segmentation model.

Analysis of collision according to driver postcode shows a number of differences to analysis by collision location. Whilst sub cluster 302 was the location with the highest collision rate for drivers over 60, it had amongst the lowest rate of collisions for residents over 60.

Figures 1 and 2 also show that sub cluster 103 has a higher number of collisions per head than average amongst drivers aged 60 or over, both in terms of the location of the collision and the home postcode of the driver.
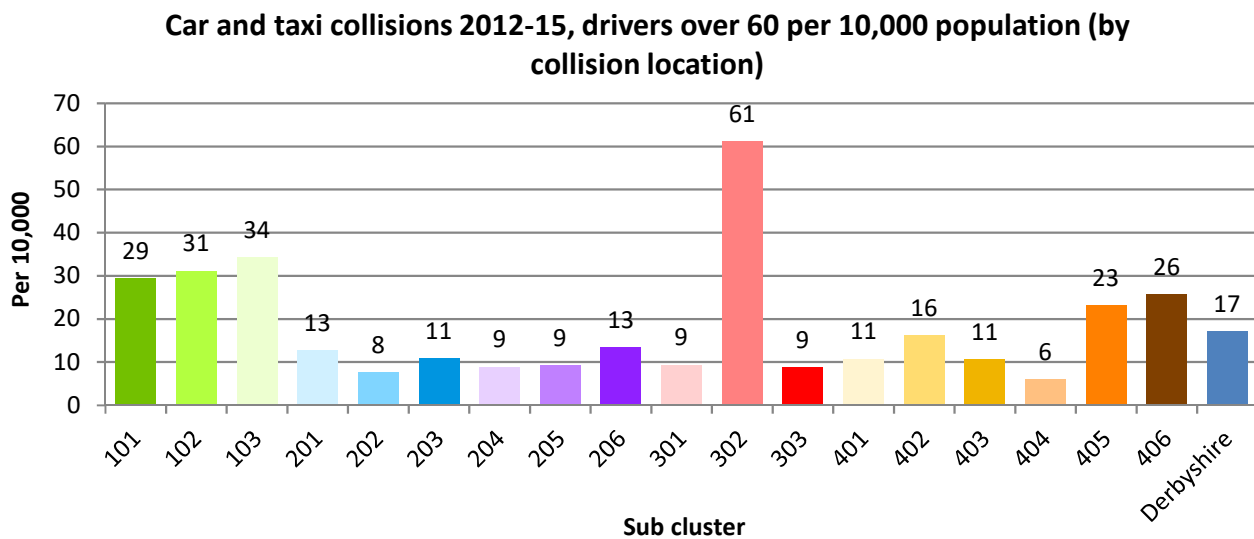
Figure 1: Collisions by location

Car and taxi collisions 2012-15, drivers over 60 per 10,000 population (by collision location)

Figure 2: Collisions by driver postcode

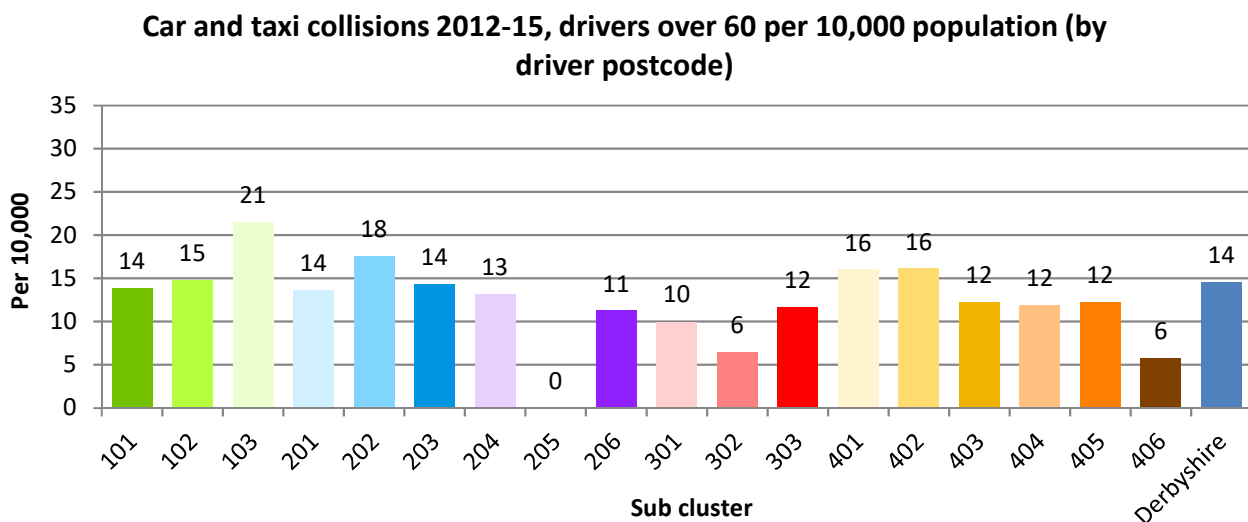**Car and taxi collisions 2012-15, drivers over 60 per 10,000 population (by driver postcode)**


Figure 3 shows a comparison between the collision rate for drivers aged 16-59 and those 60 or over, both according to the postcode of the driver. Sub cluster 101 has the highest rate of collisions amongst 16-59 year olds, but this falls to below average amongst drivers aged 60 or over. For sub cluster 103 the rate of collisions is above average in both age groups, but particularly high for drivers aged 60 or over. Sub cluster 202 shows a slightly below average rate of collisions for the population aged 16-59, but above average rate for drivers aged 60 or over.

Sub cluster 205 shows a below average rate of collisions for both age groups, but this sub cluster has an extremely small population and is based on the edge of Derby city, or in Shirebrook on the eastern edge of Derbyshire. Consequently it is likely that that this group makes a higher than average proportion of journeys outside the county administrative area. Sub clusters 302 and 406 also had particularly low rates of collisions involving drivers over 60 years of age and both of these sub clusters have younger than average populations.

Figure 3: Comparison of rates of collisions amongst drivers aged 16-59 and 60 or over (by driver postcode)

Difference to County Average of Collisions by Age Group 2012-15
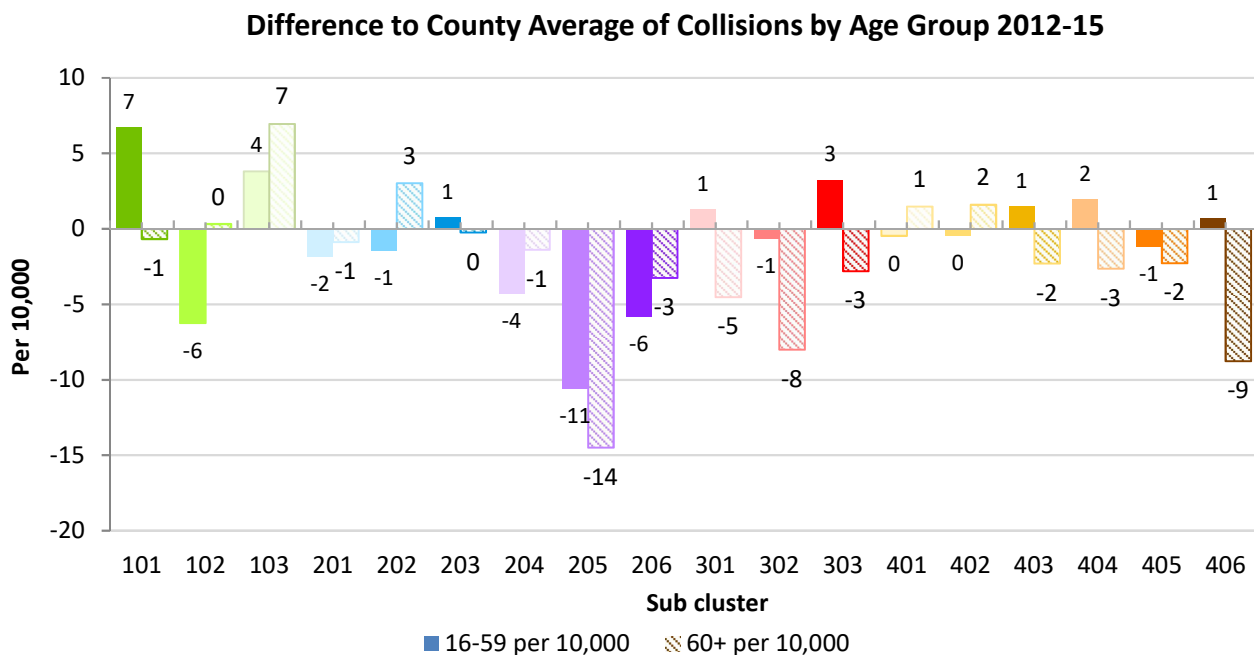
Significance testing

Statistical testing by driver location was carried out to assess whether there was a significantly higher rate of collisions for drivers aged over 60 in any particular sub cluster.

1. An ANOVA test showed significant difference between the rate of collisions in some sub clusters and the county mean. Subsequent T tests were conducted on sub clusters with higher than average rate of collisions to assess which sub clusters had a significantly higher than average rate of collisions amongst drivers aged 60 or over.

2. T tests showed that drivers aged 60 or over from sub cluster 103 had a significantly higher rate of collisions than the Derbyshire average. Sub clusters 101, 102, 401, 402 and 202 (the sub clusters with higher than average rates of collisions amongst drivers aged 60 or over) were not significantly different to the county average.

Details of collisions

As sub cluster 103 had a significantly higher rate of collisions amongst drivers aged 60 or over, further analysis was conducted to highlight the particular characteristics of these collisions. The complete data for these collisions can be seen in Appendix C. A map of the collision locations can be seen in Appendix D.

The key characteristics of collisions involving drivers over the age of 60 from sub cluster 103, compared to collisions involving drivers over the age 60 from all sub clusters, are shown below.

1. Drivers had an average age of 71, broadly similar to the average age for driver aged 60 or over involved in a collision in Derbyshire.
2. 94% were collisions on single carriageway roads, slightly above the average of 90%.

3. There were below average collisions on roads with 30mph limits and above average collisions on roads with 50 and 60 mph limits (see Figure 4 below).

Figure 4: Percentage of collisions by speed limit for drivers aged 60 or over and living sub cluster 103

Car and taxi collisions, drivers 60 and over by speed limit 2012-15 (by driver location)
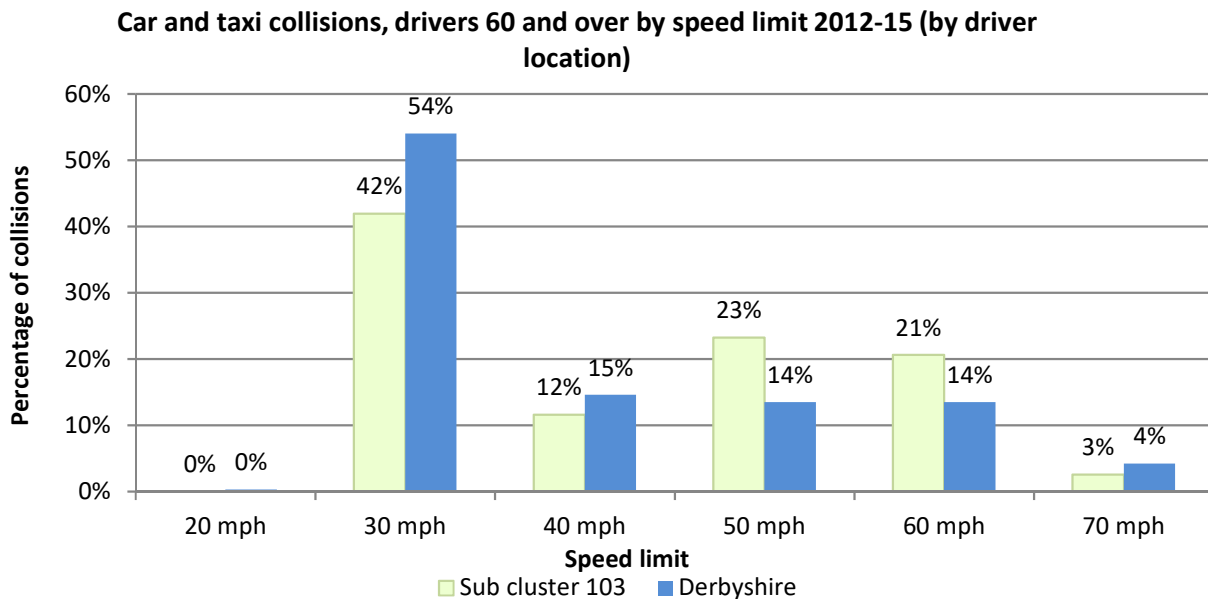
4. 49% of collisions happened on 'A' roads, compared to the average of 44%.
5. 67% of collisions took place in dry conditions, which is average.
6. 74% of collisions took place in fine weather compared to 81% overall.
7. 88% happened in daylight, compared to an average of 84%.
8. 49% of collisions involving drivers aged 60 or over and living sub cluster 103, also took place in sub cluster 103. 72% of collisions involving these drivers took place in sub clusters 101, 102 and 103, which cover the rural areas of Derbyshire with low population density.
9. 65% of collisions took place without drivers attempting a turning manoeuvre, close to the average of 64% for drivers aged 60 or over in Derbyshire.
10. 27% of collisions involving drivers aged 60 or over from sub cluster 103 were fatal or severe, a higher percentage than the Derbyshire average for drivers aged 60 or over of 20%. It is also higher than the Derbyshire average for drivers aged 16-59, which is 13%.

These findings are generally supported by the findings of national research into collisions amongst older drivers by the Institute of Advanced Motorists (IAM).[1] IAM research found that older drivers were generally more likely to be involved in a collision in the daytime, in fine weather and on 'A' roads, and attribute these trends to self-regulation on the part of older drivers, who are more likely to drive in these conditions. These findings are reflected in the analysis of collisions involving drivers over the age 60 in Derbyshire, particularly those living in sub cluster 103.

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[1] IAM (2010), *Older Drivers: Safe or Unsafe?*

IAM also found that older drivers were more likely to be involved in collisions on roads with higher speed limits and were also more likely to be in collisions resulting in fatality or serious injury. This was the case for older drivers from sub cluster 103 in Derbyshire, who were more likely than other older drivers to have a collision on 50 or 60 mph roads and for that collision to be serious.

Communication

Communication preferences for different Derbyshire sub clusters were collected during a survey of Derbyshire Citizens' Panel members in February 2016.

1. 93% of respondents from sub cluster 103 had access to the internet.
2. Respondents from sub cluster 103 had the lowest use of social media any group in the county. 31% of respondents used some form of social media, the majority of whom used facebook.
3. 95% read a paper copy of a newspaper and nearly 40% (also above average) read an online newspaper. Both figures were higher than the Derbyshire average.
4. Respondents in sub cluster 103 were the most likely to read a broadsheet newspaper (around half of respondents read a broadsheet paper). Nearly half of respondents read a local or free local paper.
5. Respondents from sub cluster 103 were the second most likely group to find out information using the Council website.
6. Respondents were broadly split between a preference for email and paper letter communications when receiving information from the Council, but these methods were considerably more popular than any other method.
7. 18% residents from sub cluster 103 were registered users of libraries in 2015. This was slightly below the county average, but sub cluster 103 also had the highest proportion of registered library users who were active (71% of users). Libraries may therefore be suitable locations to reach some residents.

Recommendations

Analysis of road collisions for drivers aged over the age of 60 using the Derbyshire Customer Segmentation Model highlights that drivers from sub cluster 103 are significantly more likely to be involved in a collision than other drivers aged over 60. Based on the characteristics of these collisions, together with the conclusions of national research on older drivers, it is recommended that any educational or awareness messaging is informed by the following collision characteristics:

- Drivers over the age of 60 from sub cluster 103 are most likely to have collisions on a single carriageway road, with a speed limit of 40mph or over.
- Nearly three quarters of these collisions happen in rural areas.
- Over a quarter of these collisions are severe or fatal.
- Most collisions happen in dry conditions and in daylight.

Communication with this group will be possible through a number of different channels. However, targeted messages may effectively reach this group through:

- DCC website
- Local newspapers

- Local libraries in rural areas

Other locations in sub cluster 103 may also be suitable for reaching residents, for example local events and community centres.

Appendix A - Method

The basic data set used to develop the Derbyshire Customer Segmentation Model contained 154 output area level variables, which is generally the lowest level for which Census data is available, mainly from the 2011 Census under the following categories:

- Demographic
- Employment
- Ethnicity
- Health
- Household composition
- Housing
- National Identity
- Socio Economic

Stage 1 – Variable selection

The first stage in developing the model was to reduce the full list of 154 variables to a more manageable number. This process involved looking at each of the variable groups individually and using statistical techniques to identify the relationship between variables. So, for example within the demographic variables the % male population was directly correlated to the % female population so it was decided to retain only the % female population. This resulted in a sub set of 65 variables to be used to determine the sub clusters.

Stage 2 – Super clusters

The second stage in developing a Derbyshire model was to select a set of super clusters, these were generated by looking at the nine housing variables that were retained after stage 1, together with the population density and rural classification variables:

This stage resulted in four super clusters being identified which contained 572, 454, 747 and 796 output areas.

Stage 3 – Sub clusters

Having defined the four super clusters for the county the third stage was to develop a set of sub clusters within each of these super clusters using the remaining 56 census variables. Each super cluster was considered individually and statistical techniques used to determine the most appropriate number of sub clusters, this process generated 18 sub clusters overall. Local knowledge from staff across all departments, members and district council staff has been used to confirm that the sub clusters definitions accurately reflect the areas.

Appendix B – Sub cluster descriptions

101	This sub cluster covers predominantly rural locations and has a low population density. There are higher than average levels of residents who own their own home and houses are more likely to be detached. Residents in this sub cluster are more likely to be part of a married couple and there are more people of an older working age (45-64) than in the county as a whole. Over a third of residents work in professional or managerial roles and there are higher levels of self-employment than average. Crime in these areas is below the county rate and a higher percentage of residents report feeling very safe in their area at night than across the county.
102	This sub cluster is based in rural areas and has a low population density. People are more likely than average to own their own home and live in detached housing. There is a high percentage of 45-64 year old residents and a higher than average percentage of families with children. Self-reported health is better than average. Over half of residents in this sub cluster work in professional or managerial occupations, the highest percentage in the county. The percentage of residents with degree level qualifications or above is also the highest in the county. Residents in these clusters are more likely than average to contact Call Derbyshire, but most report feeling satisfied or very satisfied with their area.
103	Sub cluster 103 has the lowest population density in the county: these areas tend to be large, rural and with few people living in them. Accordingly, this sub cluster has the highest percentage of residents working in agriculture. Residents in this sub cluster are the most likely to be self-employed, and more likely than average to be working in professional or managerial roles. A quarter of households have two adults and no children living in them, and the population of this cluster is older than average. Residents are generally very satisfied with their area, and most feel safe or very safe in their area at night.
201	This sub cluster is generally based in urban areas. Residents are more likely than average to be of working age and in professional or managerial positions. A high percentage have degree level qualifications and a higher than average percentage work in the public sector. Residents are likely to be in a couple, either with or without dependent children, and most have at least one car in their household. A high percentage of residents are in good or very good health, and they are less likely than average to contact Call Derbyshire.
202	This sub cluster is often located in less densely populated urban areas, for example on the outskirts of small towns. The population is notable for being older than average with the highest percentage of retired people, both single and in couples. Economic activity is low and this sub cluster also contains the highest percentage of residents providing unpaid care. Residents are likely to live in detached housing and are the most likely to own their home outright. Crime is also low in these areas. There are low percentages of BME residents and religions other than Church of England.
203	Residents of this sub cluster are more likely than average to be living as a single household family. There are a higher than average percentage of residents aged 35-44 years and households with dependent children. Semi-detached and terraced houses are more prevalent than average, and most residents own their own home with a mortgage. The sub cluster has a high economic activity rate with residents often working in semi-routine or routine occupations. Most people have access to a car and travel to work by car. There is a low percentage of BME residents and most residents give their country of birth as England.

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204	This sub cluster is often located on the outskirts of towns and villages and populated by older families. There is a high percentage of families with dependent children in this sub cluster and residents are the least likely to be divorced. They are often well qualified and there are low levels of unemployment. Residents are more likely than average to be self employed and many work as managers or in professional occupations. The sub cluster also has the highest percentage of people working in the public sector. Residents tend to be healthy, but a higher than average percentage provide unpaid care. They are likely to own their home and to live in detached properties. Few residents in this sub cluster do not have access to a car.
205	This sub cluster has the highest population density and areas are often based close to the borders of the county. There is a high percentage of people from BME backgrounds, especially Asian residents. It also contains the highest percentage of households with people who have English as their second language. Residents are younger than average, and there are more single person households than average. The percentage of detached properties owned with a mortgage is high, as is the percentage of households with more than two cars. The sub cluster has higher than average economic activity and residents are well-qualified. People in these clusters are less likely to feel safe than other residents and rarely contact Call Derbyshire, or use public libraries.
206	Young families living in towns and villages dominate this sub cluster. Residents are the most likely to be living in detached housing or bungalows, and are likely to own their own home. The percentage of those living as a couple with children aged 5-15 is higher than any other area. Residents are likely to have degree level qualifications, and health is better than average. There are high levels of employment and residents employed in managerial level positions. The sub cluster has the highest percentage of households with more than one vehicle and residents are likely to travel to work by car or van.
301	Older people living alone in flats or maisonettes make up a large percentage of this sub cluster. These areas have more lone residents with long term health problems than across the county as a whole. Average household size is the lowest of any sub cluster. These areas have a high percentage of residents living in social rented accommodation. A larger than average percentage of the population is retired and economic activity is low. Residents are more likely than average to be claiming an out of work benefit. The sub cluster also has a low level of car or van ownership.
302	The main feature of this sub cluster is of young single people living alone in rented accommodation. It is the sub cluster with the highest percentage of single people and of 16-24 year olds. These areas have a high percentage of flats and residents are the most likely to rent from a private landlord. The sub cluster shows high levels of unemployment and long-term unemployment. Residents in work are often in routine and semi-routine occupations such as caring, leisure, sales and customer service. There is a high percentage of households without a car or van and a higher than average percentage of BME residents from Asian and EU countries.
303	In this sub cluster residents are more likely than average to live on their own and in housing rented from a social landlord. Nearly a third of all properties are flats. Residents are likely to have no qualifications and a higher than average percentage are unemployed. Employment in these areas is heavily focused on routine or manual occupations and residents are the least likely to own a car or van. Health in these areas is worse than average and residents are the most likely to report dissatisfaction with their area, or feeling unsafe in their area at night.

| 401	This sub cluster has the highest percentage of young children and 10-19 year olds, and the highest rate of lone parent families. Residents are more likely than other areas to be unemployed or to have never worked. Those in employment are likely to be in routine or semi routine occupations. In this sub cluster there is a high percentage of residents without any qualifications. Home ownership is low and there are a high percentage of social rented properties. Residents are most likely to live in semi-detached houses and there is the highest average number of people per room of any sub cluster. Few residents have access to a car or van. People living in these areas are more likely than average to be in bad or very bad health.
402	In this sub cluster there is a slightly higher percentage of one person households and divorced people than average. Residents in these areas are more likely to live in terraced houses or flats and there is a higher than average percentage of houses with no central heating and houses rented from private landlords. Economic activity is slightly above average with particularly high levels of self-employment and residents working from home. Residents are more likely than average to contact Call Derbyshire and actively use a public library.
403	This sub cluster has an above average percentage of 16-44 year olds, of single people and of lone parents with dependent children. Residents live in densely populated areas, often in semi-detached or terraced housing. There are low levels of qualifications and residents frequently work in manual occupations. Unemployment is higher than average, as is the percentage of unemployed parents with dependent children. Residents are less likely than average to be satisfied with their area and less likely to contact Call Derbyshire. They are more likely than average to be an active user of a children's centre.
404	This sub cluster has a higher than average percentage of residents over the age of 65 who live alone. Semi-detached housing is more prevalent than in other areas and there is a higher than average percentage of social rented properties. Health in these areas is worse than the Derbyshire average with many of the areas in this sub cluster based in former mining towns to the east of the county, which has possibly contributed to the poorer health amongst older residents. There are larger percentages of sick or disabled people than average and the percentage of residents of who provide unpaid care is the second highest in the county. Residents are less likely than average to own a car or van and are more inclined to contact Call Derbyshire.
405	This sub cluster has the highest percentage of terraced housing and nearly a quarter of residents rent from private landlords. There is a larger than average percentage of people under the age of 44, single people and a high percentage of lone parents. Crime is above average in these areas and residents are less likely than average to feel safe or very safe. Residents assess their own health at around average levels, but incidence of cancer and circulatory disease are high. Unemployment is higher than average, particularly those who are long term unemployed. There is a higher than average BME population in these areas, and a larger than average percentage of people from European countries.
406	This sub cluster has the highest percentage of young people aged 25-44 and the lowest percentage of residents over 65. There is a mixture of single people and families with young children, including a high percentage of lone parents and co-habiting couples. There is a higher than average percentage of privately rented houses. Residents are generally economically active and this cluster contains the highest percentage of women in full time employment. Residents are well qualified with a higher than average percentage qualified to degree level or above. Health is generally good and access to a car or van is high.

Appendix C – Collision details

Car and taxi collisions, drivers 60 and over by road class 2012-15 (by driver location)
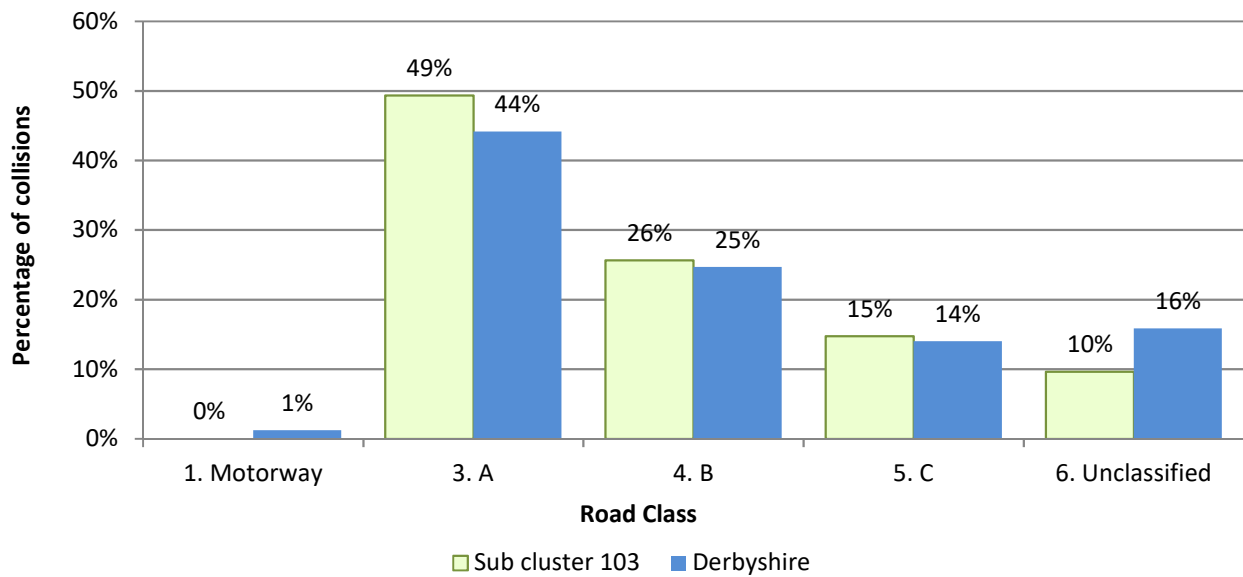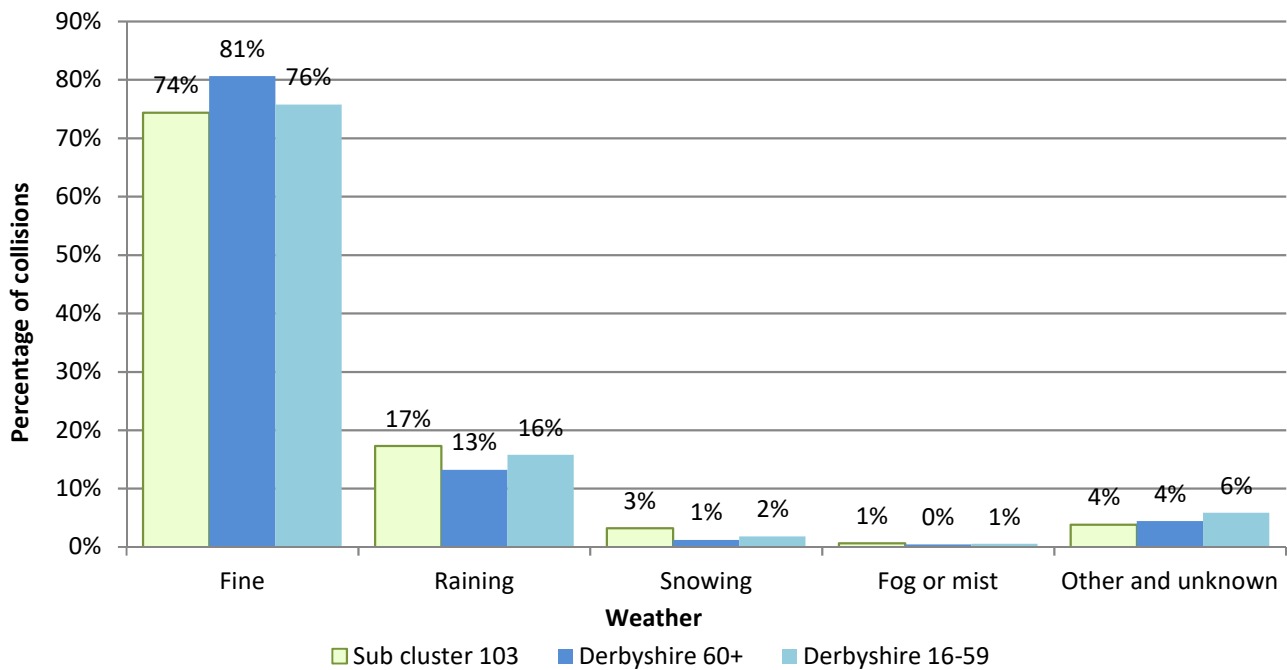

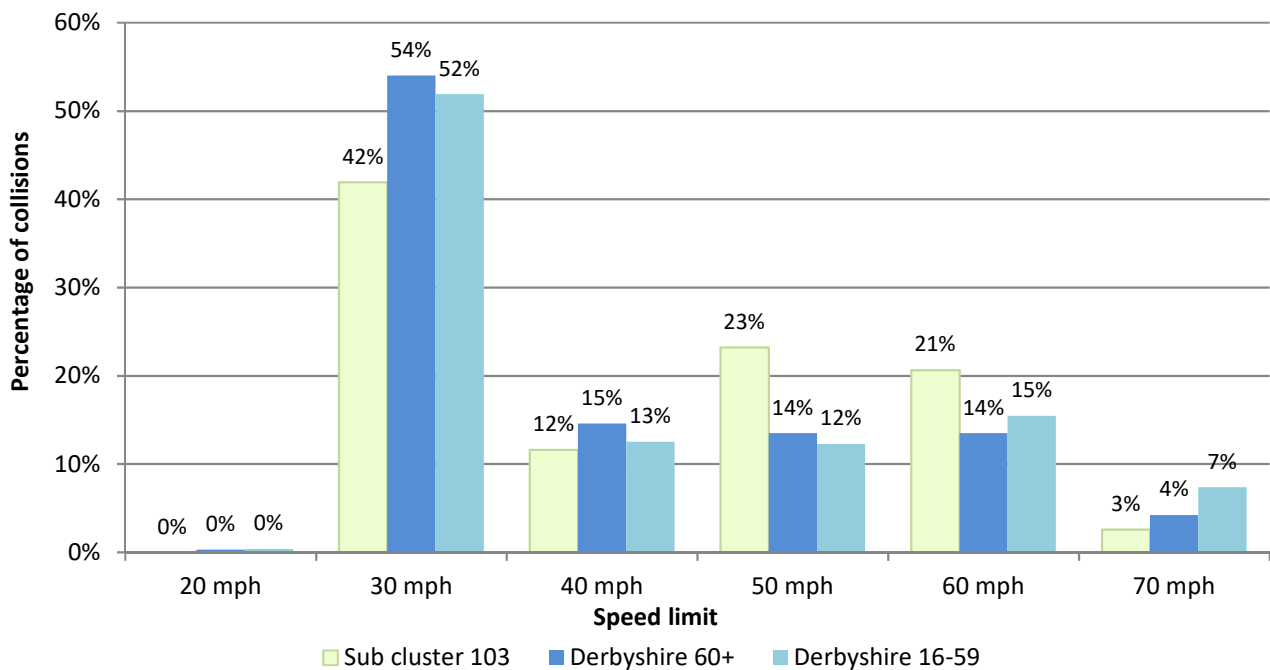**Car and taxi collisions, drivers 60 and over by conditions 2012-15 (by driver location)**
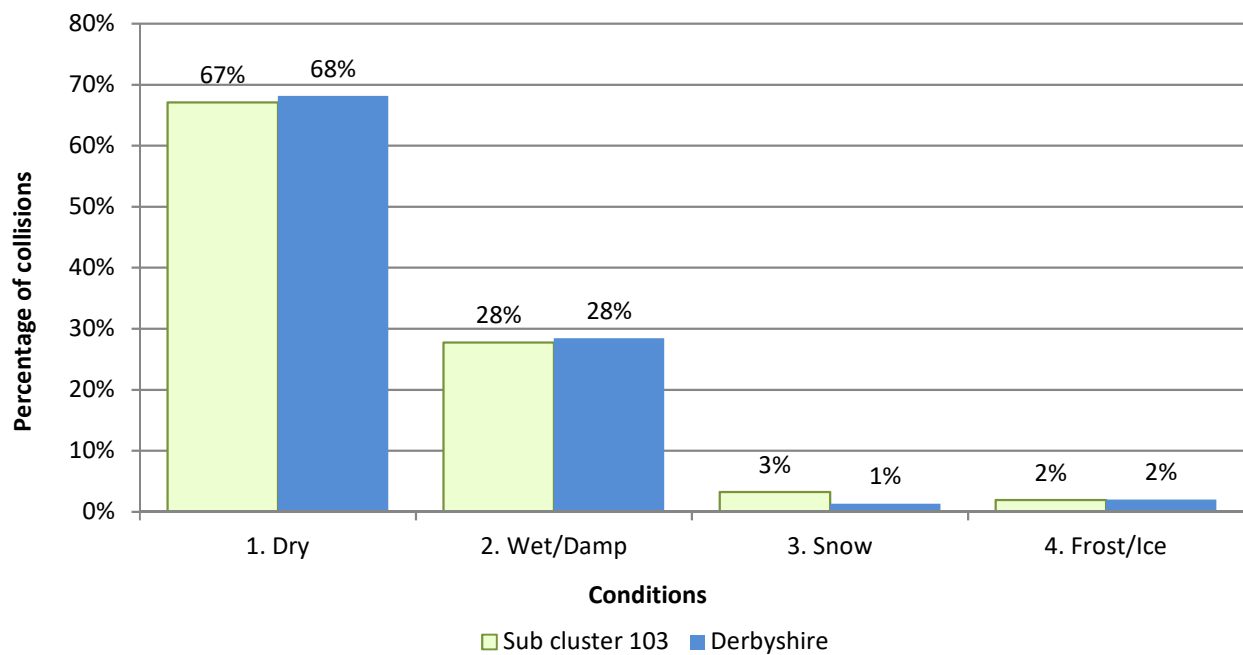
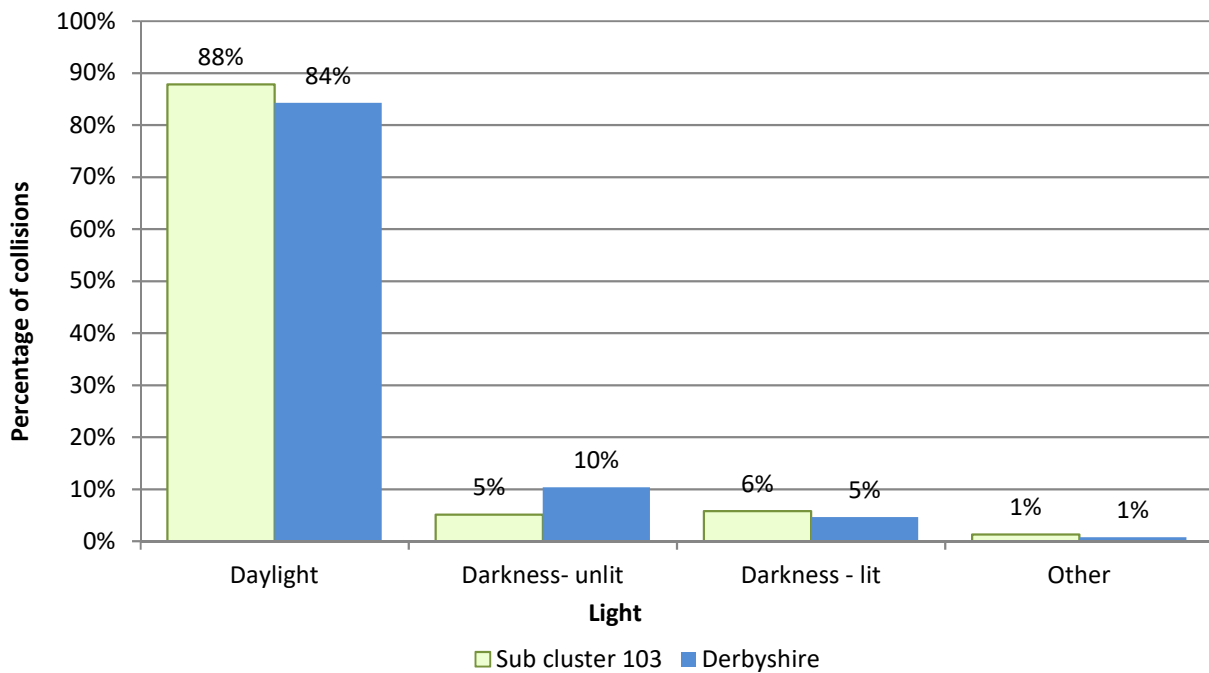**Car and taxi collisions, drivers 60 and over by weather 2012-15 (by driver location)**

Car and taxi collisions, drivers 60 and over by speed limit 2012-15 (by driver location)
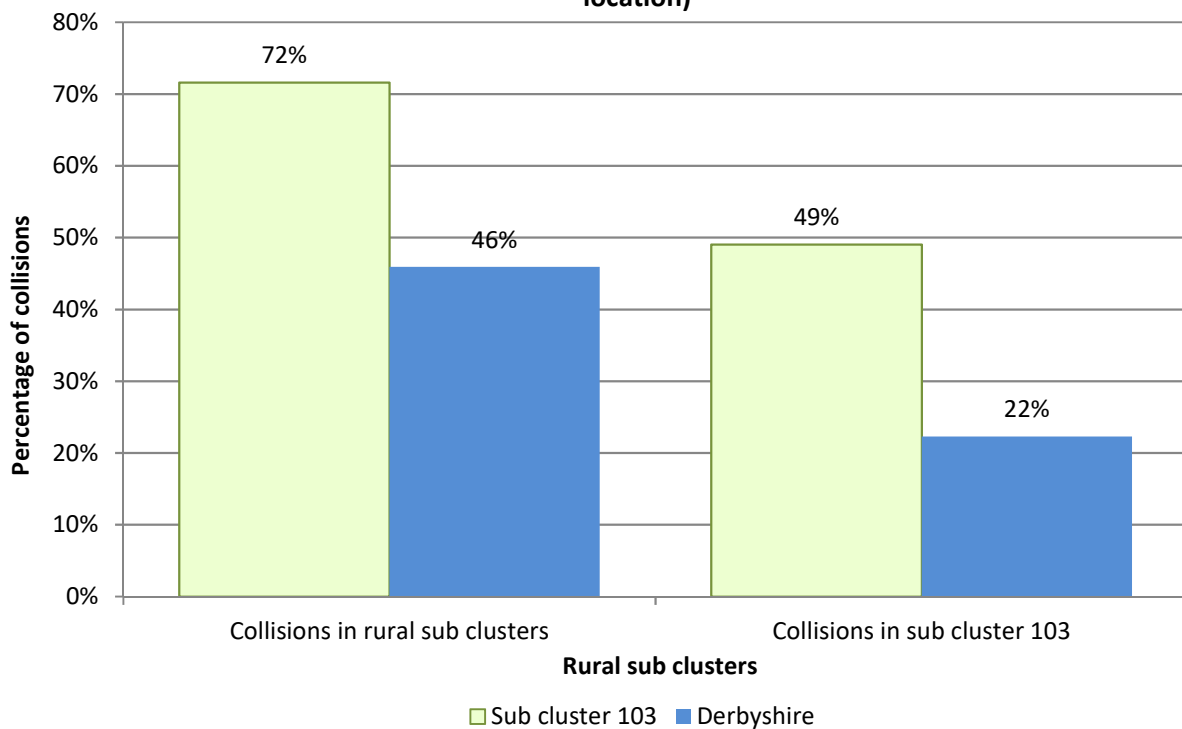
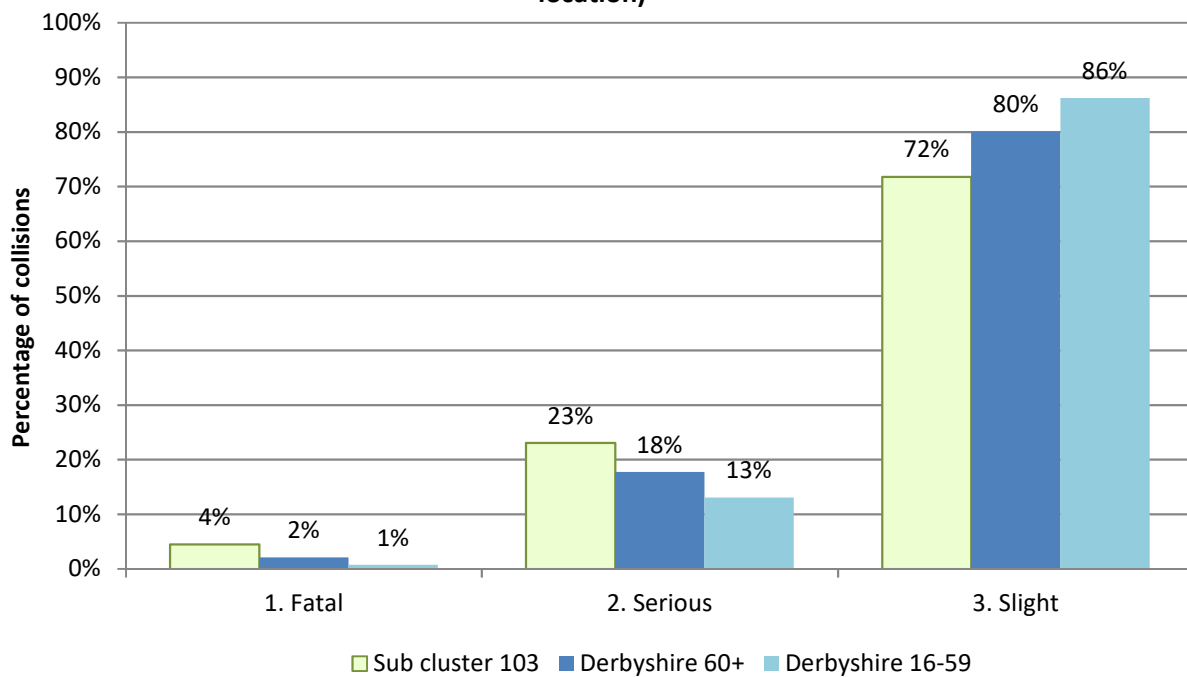**Car and taxi collisions, drivers 60 and over by light 2012-15 (by driver location)**

Car and taxi collisions, drivers 60 and over in rural sub clusters 2012-15 (by driver location)
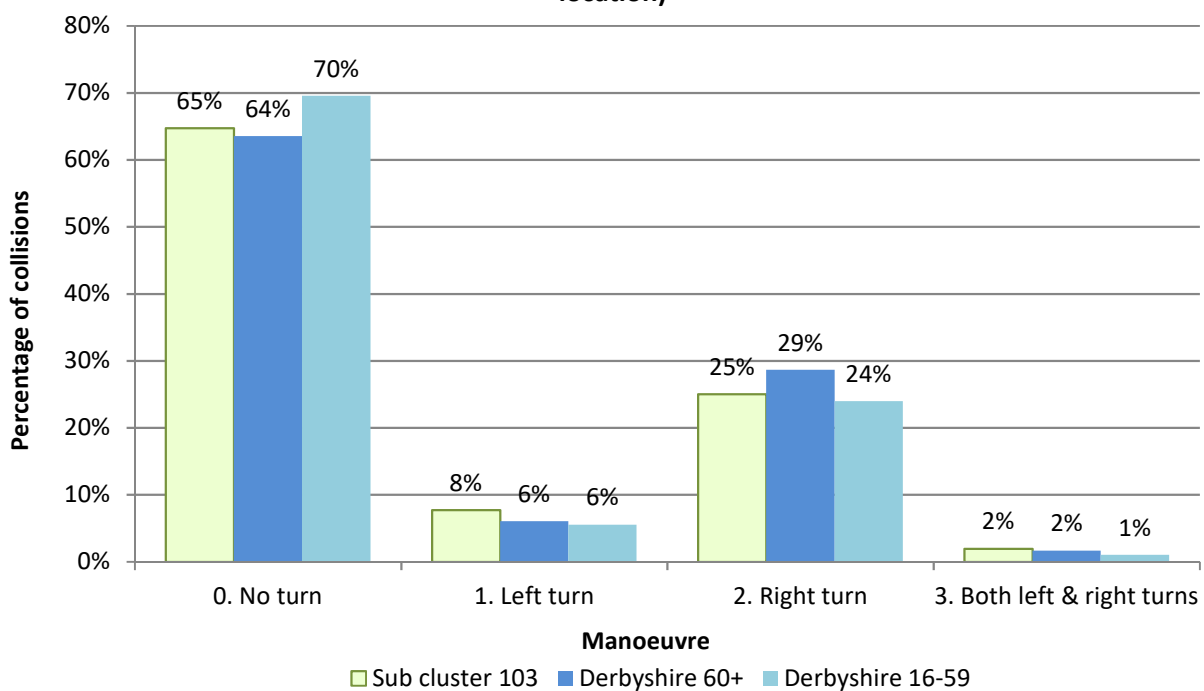
Car and taxi collisions, drivers 60 and over by severity 2012-15 (by driver location)

Legend: Sub cluster 103 | Derbyshire 60+ | Derbyshire 16-59

Car and taxi collisions, drivers 60 and over by manoeure 2012-15 (by driver location)

Manoeuvre

Legend: Sub cluster 103 | Derbyshire 60+ | Derbyshire 16-59

Appendix D – Collision locations

Road collisions for drivers aged 60 or over from 103

Sub Clusters
Including Collisions from Sub Cluster 103

- 101
- 102
- 103
- 201
- 202
- 203
- 204
- 205
- 206
- 301
- 302
- 303
- 401
- 402
- 403
- 404
- 405
- 406
- Collision

Date: 24/06/2019
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