Older people, transport and driving

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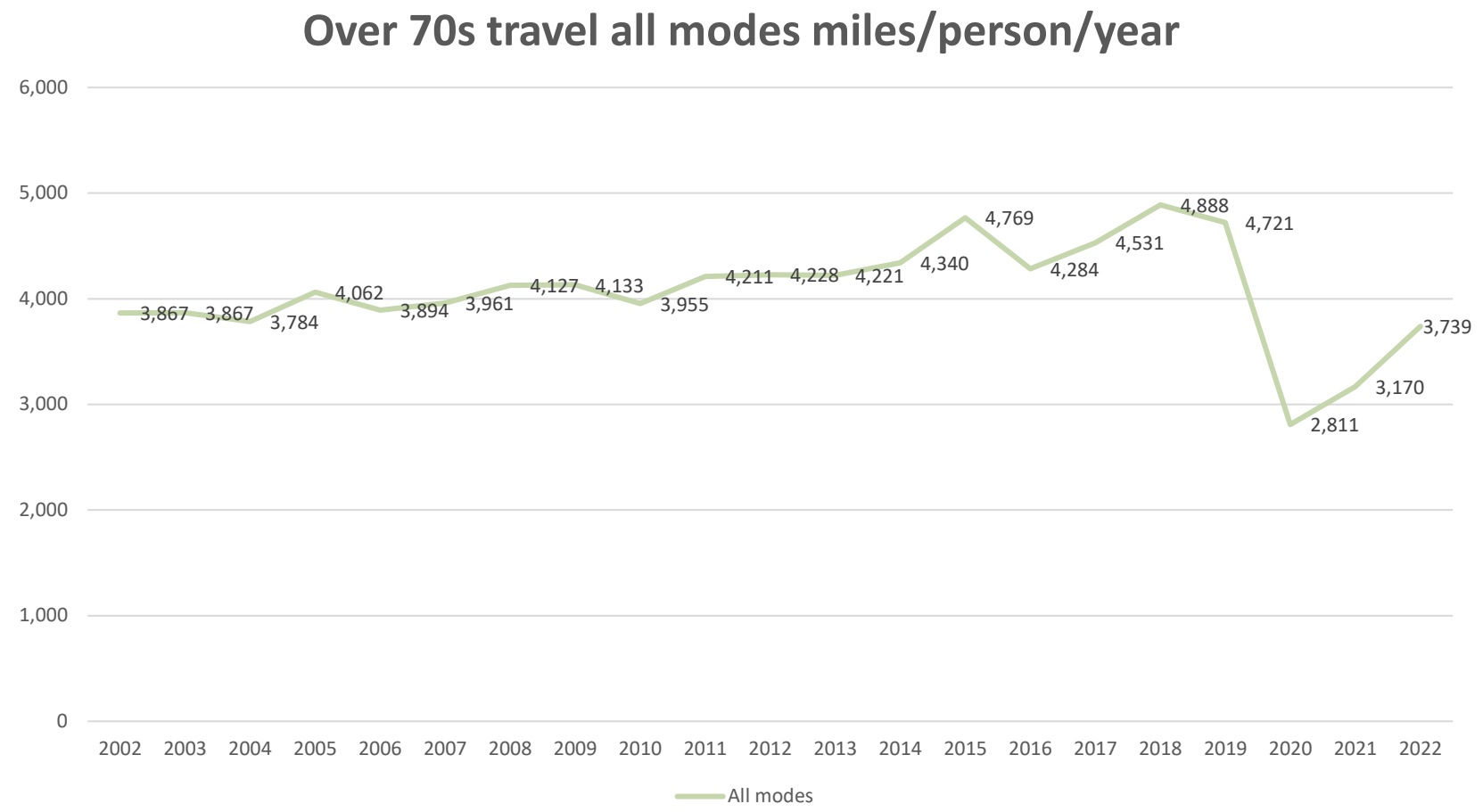
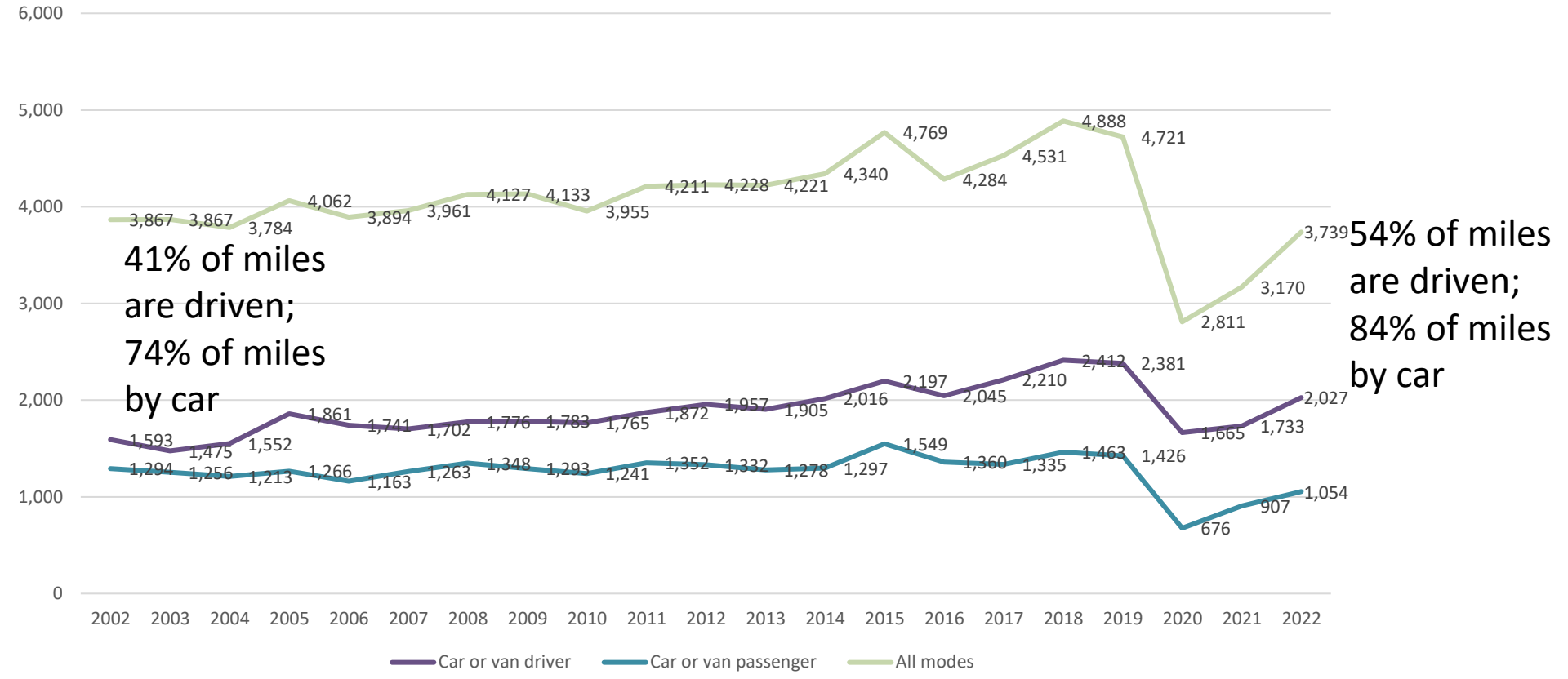
THINK
Rhwydwaith Ymchwil Integredig Trafnidiaeth ac Iechyd
the Transport and Health Integrated research NetworK

Y Ganolfan Ymchwil Heneiddio a Dementia
CADR
Centre for Ageing & Dementia Research

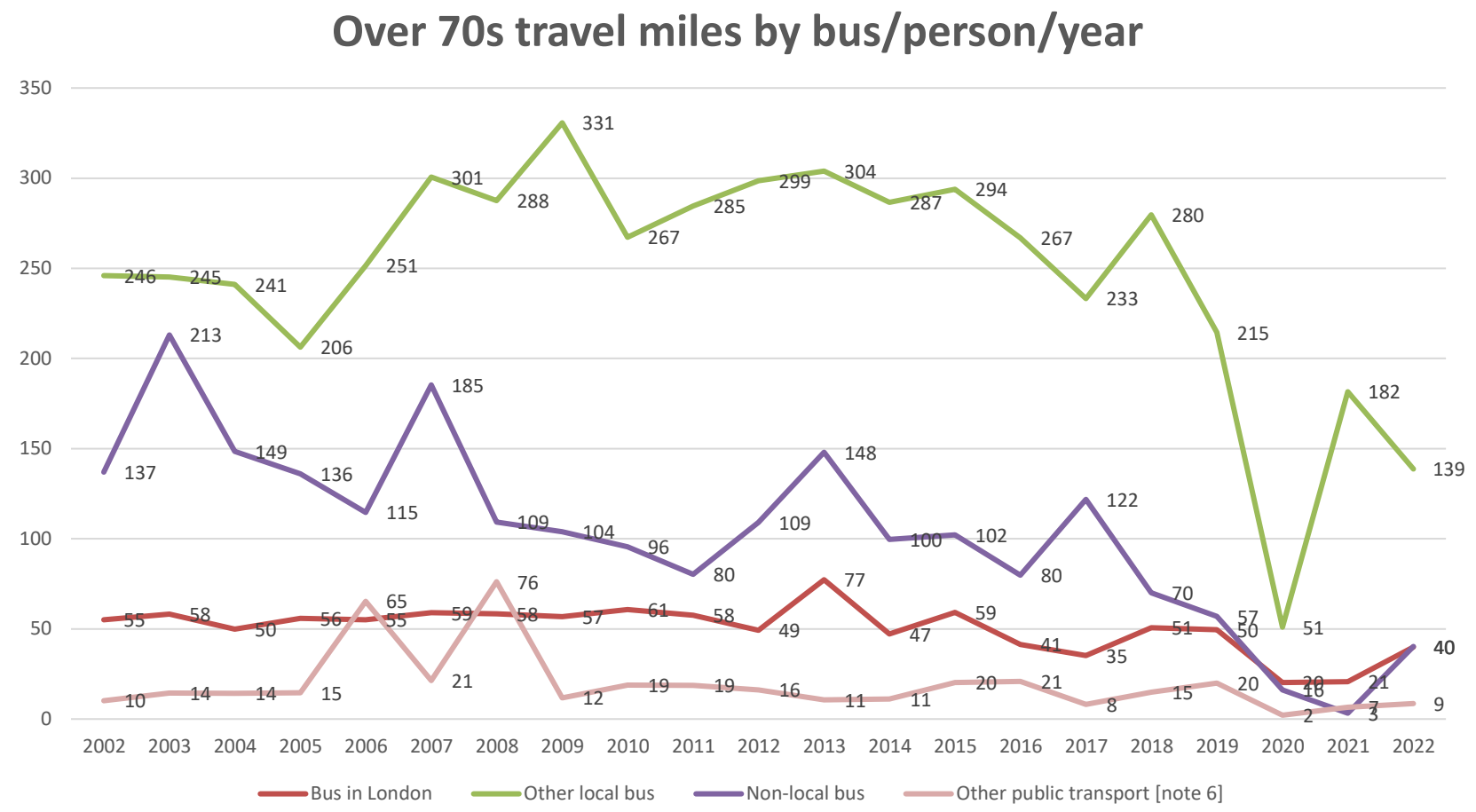

Over 70s travel all modes miles/person/year
6,000
5,000
4,000
3,000
2,000
1,000
0
3,867
3,867
3,784
4,062
3,894
3,961
4,127
4,133
3,955
4,211
4,228
4,221
4,340
4,769
4,284
4,531
4,888
4,721
2,811
3,170
3,739
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
All modes

Over 70s travel miles by car/person/year

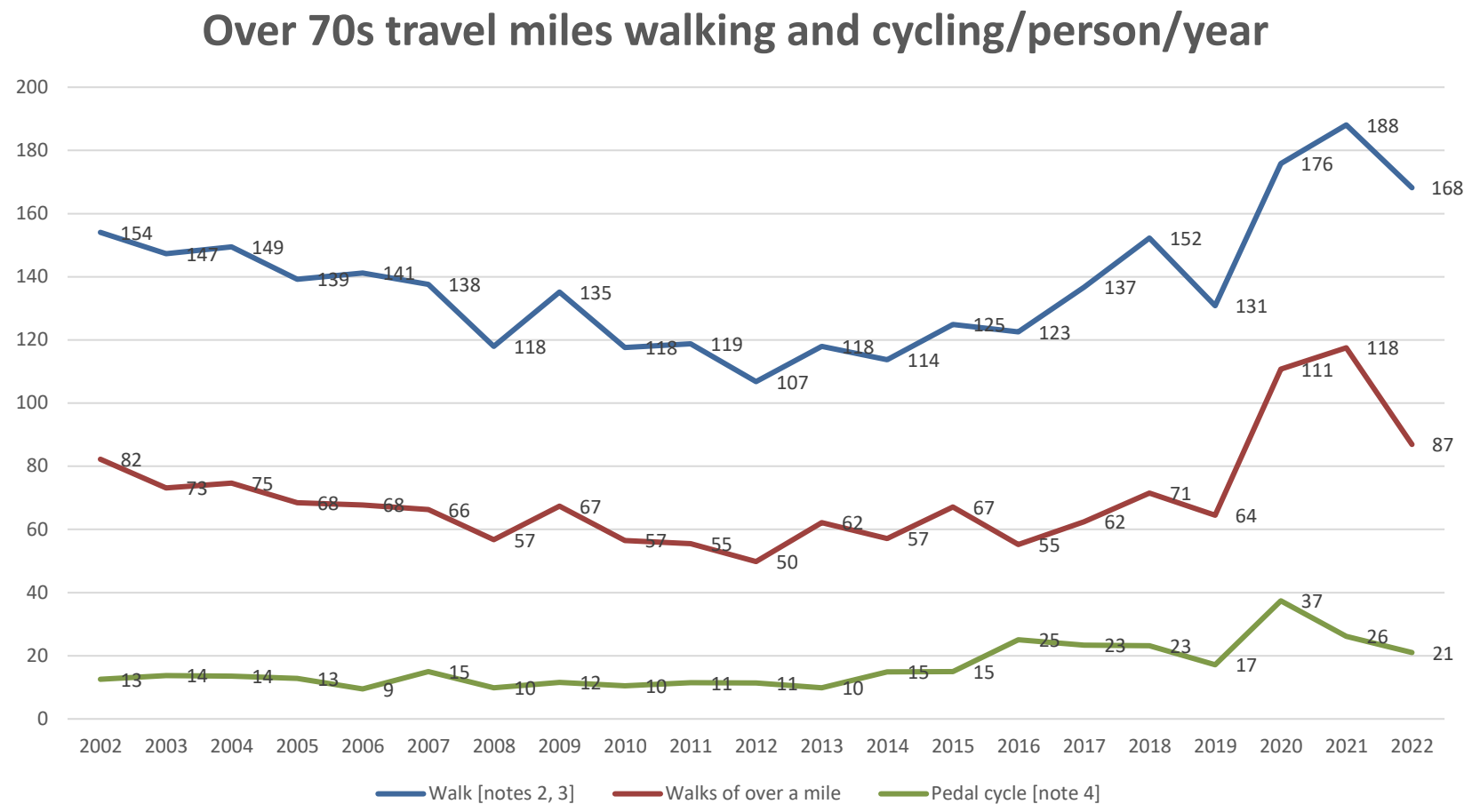


41% of miles are driven; 74% of miles by car

54% of miles are driven; 84% of miles by car


Over 70s travel miles by bus/person/year
350
300
250
200
150
100
50
0
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
246 245 241 206 251 301 288 331 267 285 299 304 287 294 267 233 280 215 51 182 139
137 213 149 136 115 185 109 104 96 80 109 148 100 102 80 122 70 57 18 7 40
55 58 50 56 55 59 58 57 61 58 49 77 47 59 41 35 51 50 20 21
10 14 14 15 65 21 76 12 19 19 16 11 11 20 21 8 15 20 2 3 9
Bus in London
Other local bus
Non-local bus
Other public transport [note 6]


Over 70s travel miles by rail/person/year
300
250
200
150
100
50
0
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
164 206 206 152 150 115 179 166 147 222 159 184 184 209 144 222 225 274 92 44 110
12 16 8 11 12 15 13 18 19 18 16 15 15 23 16 13 22 27 9 4 34
London Underground
Surface Rail

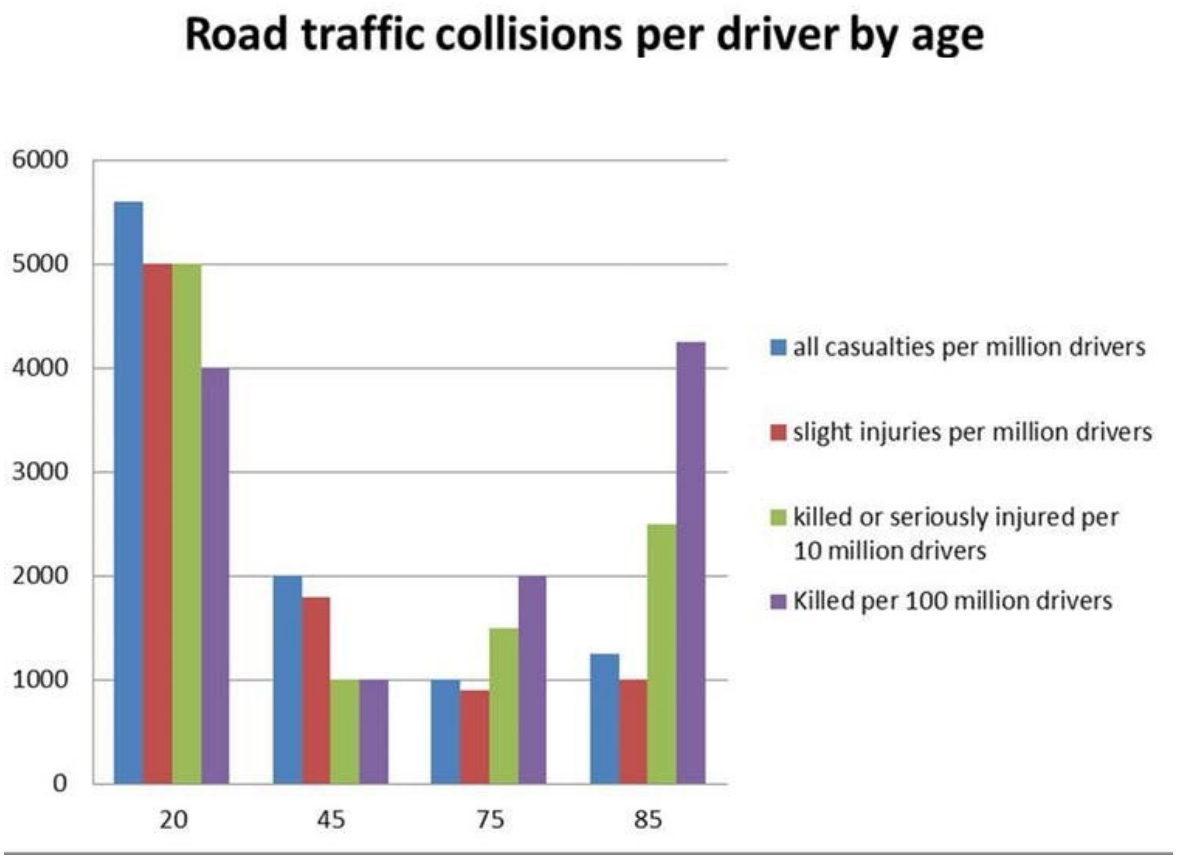

Over 70s travel miles walking and cycling/person/year
200
180
160
140
120
100
80
60
40
20
0
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
154 147 149 139 141 138 118 135 118 119 107 118 114 125 123 137 152 131 176 188 168
82 73 75 68 68 66 57 67 57 55 50 62 57 67 55 62 71 64 111 118 87
13 14 14 13 9 15 10 12 10 11 11 10 15 15 25 23 23 17 37 26 21
Walk [notes 2, 3]
Walks of over a mile
Pedal cycle [note 4]

Contents

- Older drivers tend to be safe drivers
- But they are motivated to drive when it isn’t safe
- They do have a significant collision profile
- They need support to help them make the decision to drive or not
- Alternatives to driving are poorly constructed

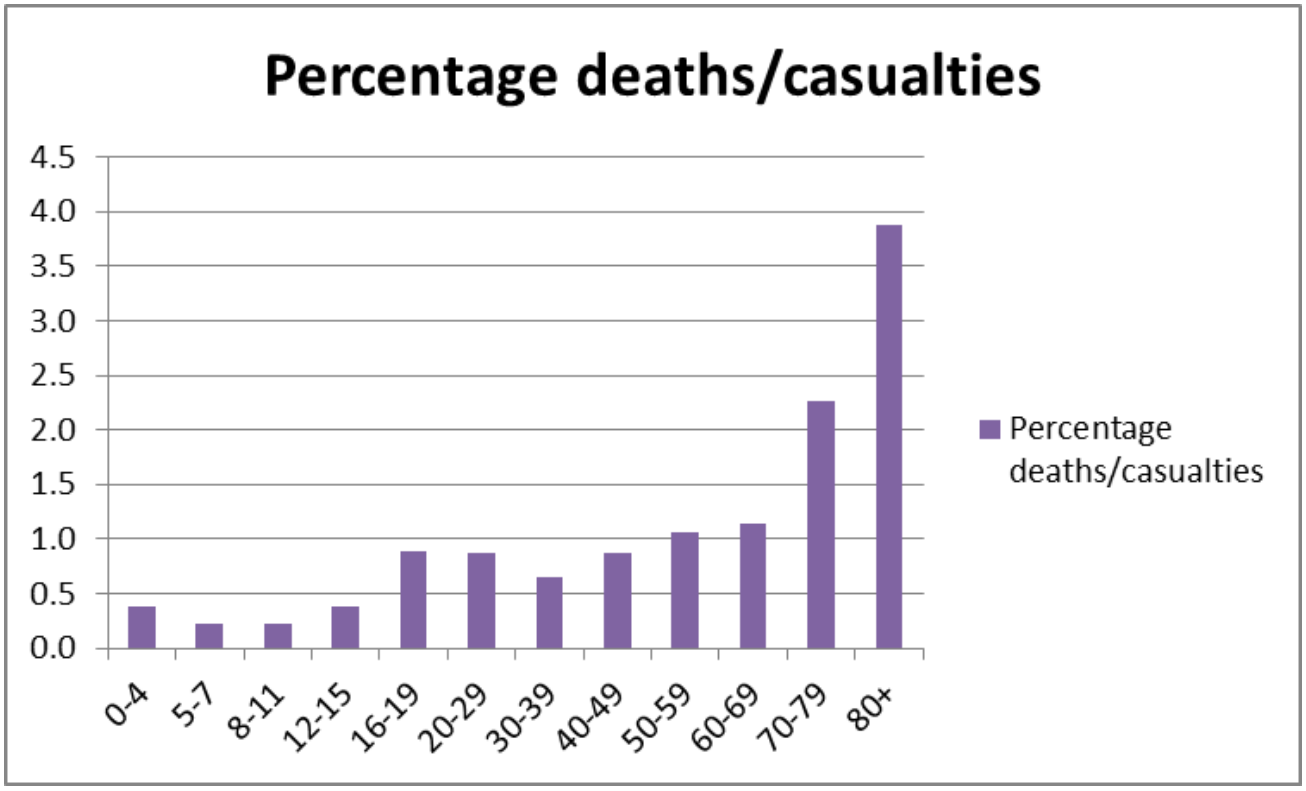
Are older drivers safe?

We know older drivers on the whole are safe drivers



- When older drivers are involved in a crash, the likelihood of them being killed or seriously injured is up to four times higher- almost all of this increase is because of their frailty - rather than safety.

Mitchell, C.G.B. (2018). Are Older People Safe Drivers on the Roads, Testing and Training? In C.Musselwhite (ed.) Transport, Travel and Later Life (pp. 37–63). Bingley: Emerald Publishing Limited



Over 60s in GB	GB
Population	24.4%
Use (in miles)	25.16%
KSI as a driver	26.24%
Killed as a driver	**36.34%**

Over 60s in GB	GB
Population	24.4%
Use (in miles)	20.15%
KSI as a car passenger	21.25%
Killed as a car passenger	**30.25%**

Changes as we age:-

- **Changes in cognition**
  - Selective and sustained attention, perceptual speed, working memory, task switching, cognitive overload (see Musselwhite, 2017 for review)
- **Changes in eyesight**
  - Between the ages of 15 and 65 years, susceptibility to glare increases, and recovery form glare increases from two to nine seconds (DfT, 2001).
  - Research suggests that by the age of 75 years old drivers may require 32 times the brightness they did at the age of 25 in order to be able to see effectively.
- **Changes in mobility**
  - Less mobility in neck, leg, knees, hips.
  - Fatigue

- **Not having full awareness to make decision**
- **Looked, didn't see.**
- **Gap acceptance**
- **Being distracted**
- **Reaction times:**
  - Reaction time shortens from infancy to around 20 years of age, then increases slowly to around 70 years of age and beyond (Der and Deary, 2006; Jevas and Yan, 2001; Welford, 1977).
  - A person over the age of 65 can have reactions times up to 22 times slower than that of someone of 30 years of age (see DfT, 2001; Hultsch, et al., 2002)

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- **Changes in mobility**
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  - Fatigue

Experience and adaptation

Compensatory behaviour – reducing driving in:
- Rush hour
- Bad weather
- Making difficult turns
- Stressful situations
- A hurry

Not having full awareness to make decision

Looked, didn't see.

Gap acceptance

Being distracted

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Some issues remain… (contributory factors)

Cognitive issues

CF 1 and 2: Driver failed to look properly; driver failed to judge speed

- Turning right – overload (time corrects)
- Low mileage – learning from feedback (practice has some effect)
- **Feedback into action (to do)**

Awareness of behaviour

CF 5: Driver nervous, uncertain or in a panic.

- Forgiving feedback loop (for us all!)
- Cognitive changes mean even less?
- Escalation of commitment
- **Attribution of error (to self)**

Physiological issues

CF4: illness or disability

- Fatigue

CF7: Dazzling sun.

- Eyesight

The manoeuvres associated with car accidents also vary with the age of the driver Figures 7.12a and 7.12b).

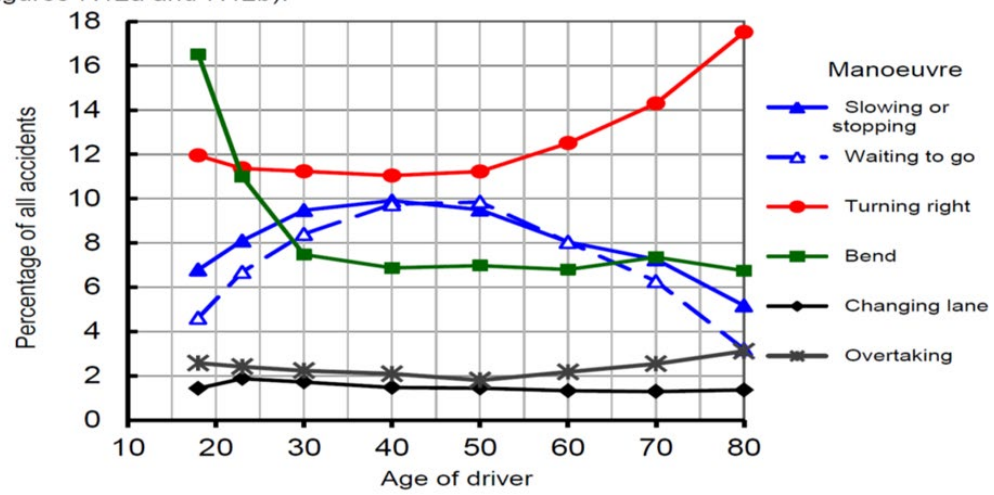
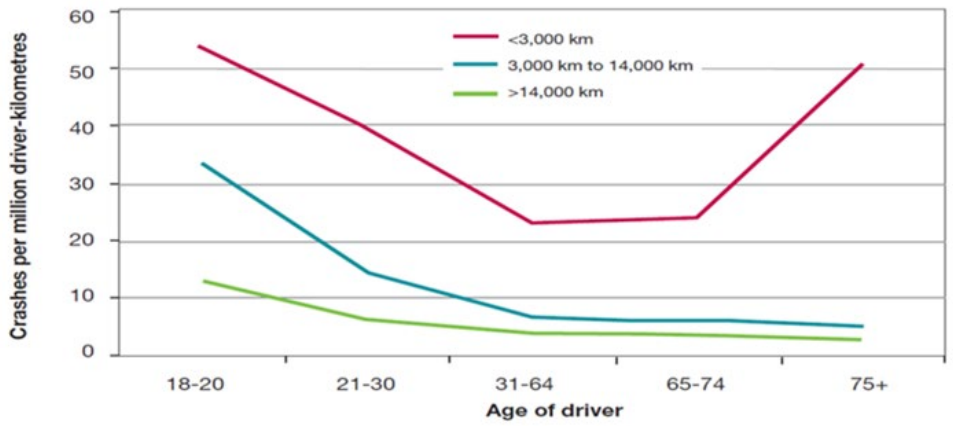


Figure 4.1 Accident involvement (all severities) per million driver kilometres



Source: Langford *et al* (2006) Older drivers do not have a high crash risk—A replication of low mileage bias. *Accident Analysis & Prevention* Volume 38, Issue 3 , May 2006, pp 574-578.

Musselwhite, C.B.A. (2017) Assessment of computer-based training packages to improve the safety of older people's driver behaviour. *Transport Planning & Technology*, 40(1), 64-79.

Mitchell, C.G.B. (2017). Are Older People Safe Drivers on the Roads, Testing and Training? In C.Musselwhite (ed.) Transport, Travel and Later Life (pp. 37–63). Bingley: Emerald Publishing Limite

Improving older people's road safety

How do we identify and improve these behaviours?

- Cognition
- Awareness and attribution
- Fatigue
- Eyesight

Education and training

- Awareness and feedback
- Improve skills

Reduce the cognitive and physical load

- Improve road
- Improve vehicle
- Testing

Awareness and feedback

- **Involvement in collision/near miss**

  - **Near misses often have the same precursors as more severe collisions**
  - **Some evidence that a history of near misses or minor collisions are related to more severe collisions**
  - **Basic requirement in other sectors – aviation, rail, beginning to be used in NHS**

Forgiving environment

- **But do we even notice near misses? Tend to forget and not learn from them**
- **Evidence not of perfect correlation - suggests only some near miss types are related, while others are not.**

Feedback

- **A role perhaps for telematics, black box technology, dash cams.**

Awareness and feedback

Drivers already feel they are aware of their driving behaviour and adapt and compensate for alterations caused by ageing. But circular - those that do more of that are already the very safest drivers.

But almost all consider themselves to be better than average! Especially the less safe drivers.

Almost all consider themselves better than when they were younger. But this is especially the less safe drivers.

Welcome assessment and re-learning. Especially if they are really safe drivers.

Would like more information on health linked to driving – would welcome more interventions from health professionals.

Previous research suggests almost all drivers are not good at self-assessment, but maybe this can be altered – how do we get better feedback from our driving – education/training. Friends/family. Being reflective and open to change.

Improve skills

- **Education & training**

Education and training improve

driver knowledge (see e.g., Eby et al., 2003; Marottoli, 2007; Owsley et al. 2004),

self-reported driving behaviours (McCoy et al., 1993; Owsley et al., 2004)

on-road driving assessments (Bédard et al., 2004; Marottoli, 2007),

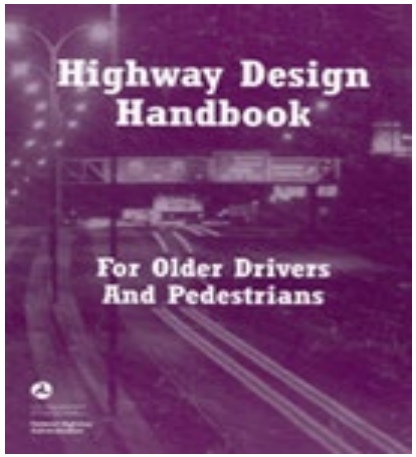
- **Some positive findings, but need more evidence to suggest they reduce crashes esp over time** (Berube et al., 1995; Korner-Bitensky, Kua, von Zweck, & van Benthem, 2009; Ker et al., 2005; Kua et al., 2007; Nasvadi & Vavrik, 2007; Owsley et al., 2004).

iAM RoadSmart

ROSPA accidents don't have to happen

Driver Skills Scheme 60+

Improve the road



- **Change the infrastructure**

Extra attention to:

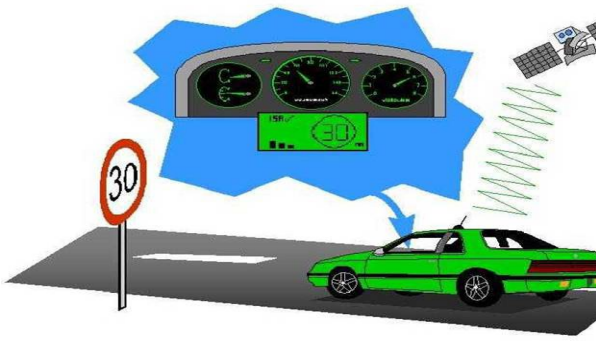
- **Signage**
  - Larger lettering, better reflection
- **Barriers to stop wrong way driving**
- **Merges onto main roads**
  - Protected lanes, longer slips
- **Edge and lane markings**
- **Intersections**
  - Roundabouts not T-junctions
  - Stop and give way signs
  - Traffic signals

Lower speed limits?

- Allow people more time

- Evidence? Often in isolation?
  - Effect on other drivers (that then in turn effect older drivers)?
  - Effect on pedestrians?

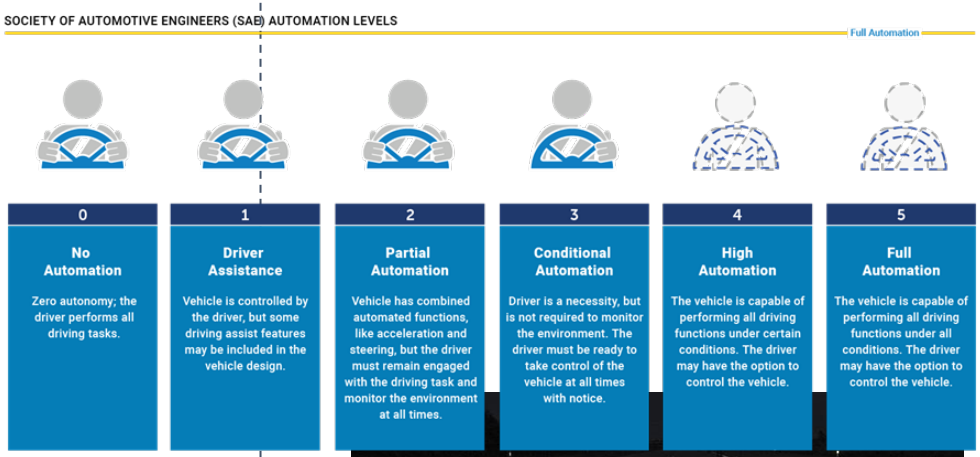
Improve vehicle



- **Change the vehicle**

Towards driverless or automated vehicles:

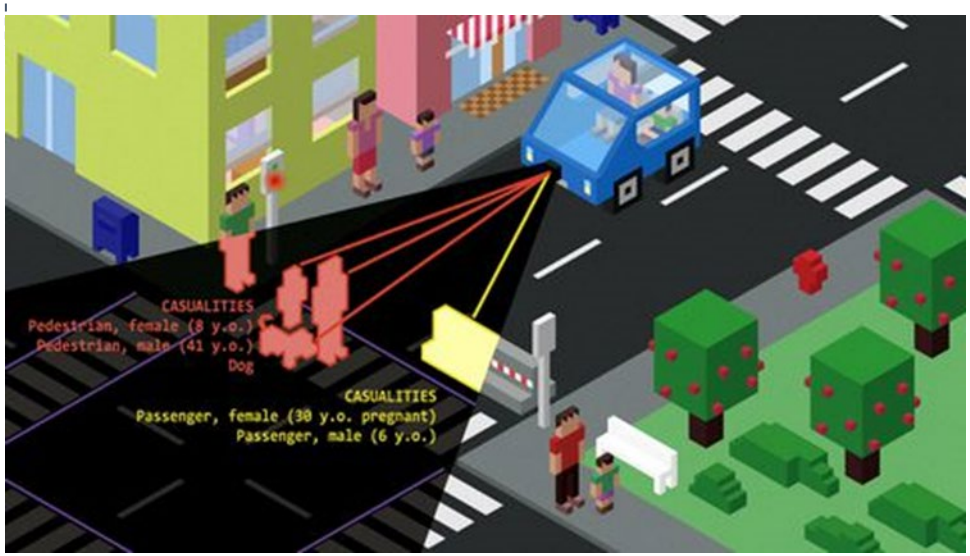
- **Informative systems**
  - Much preferred
  - Head-up displays
  - Prioritise and manage displays
- **Advisory systems**
  - Warning messages liked if understood
  - Somewhat liked
- **Take over systems**
  - Potentially most useful but least liked
  - Improved when used!

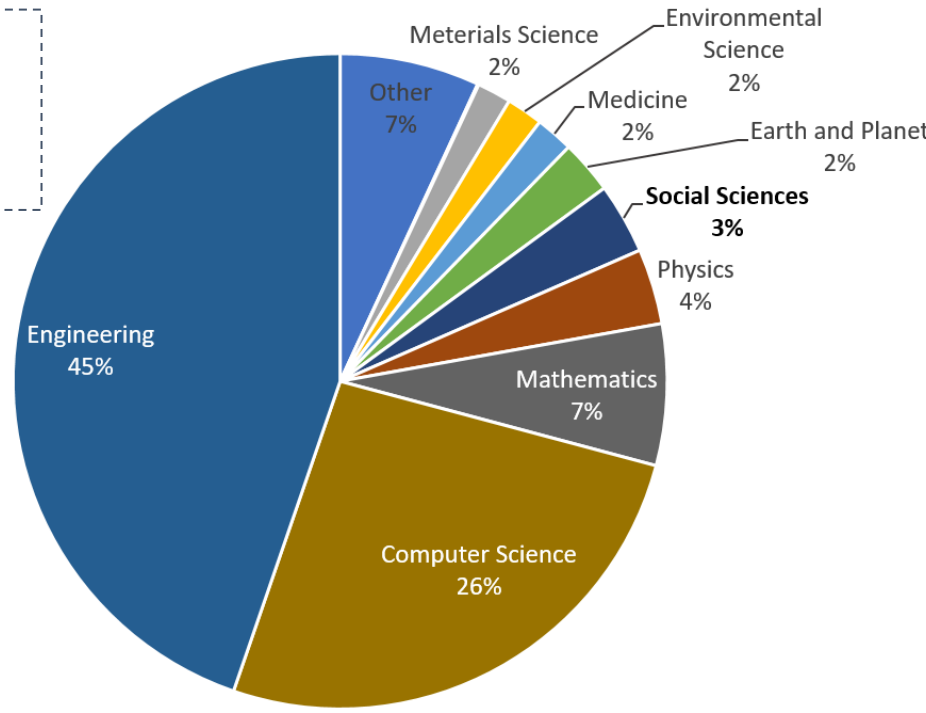


- Reality?
  - Totally autonomous? Older people take longer to re-take control of vehicle, underload-overload issues greater etc.

• Driverless automated future – the Musk effect!!

- **No need to worry, a driverless future is just round the corner.**





- **Change in mobility practice.**
- **Change in ownership and business**
- **Ethical challenges**
- **Envisage what kind of society we want**

Keywords & synonyms related to Automated Vehicles (Scopus Database)
Source: Cavoli, C. M., Phillips, B., Cohen, T., & Jones, P. (2017). ***Social and behavioural questions associated with Automated Vehicles. A Literature Review***. London, UK: Department for Transport.

Social Science references related to #Automated Vehicles represent less than 6% of the total!

- **Testing**

No evidence it works

• Across Europe, Netherlands and UK have **lowest fatality rates and the most relaxed procedure** (Mitchell 2008)

• Across USA **no differences** found in states with stringent testing (**except states with increased eyesight testing = improved safety**). (Grabowki et al 2004, McGwin et al, 2008)

• Denmark introduced cognitive screening – **no effect on collision rates (in fact increased for older pedestrians**) (Siren and Meng, 2012) – Denmark has stopped screening (March 2017)

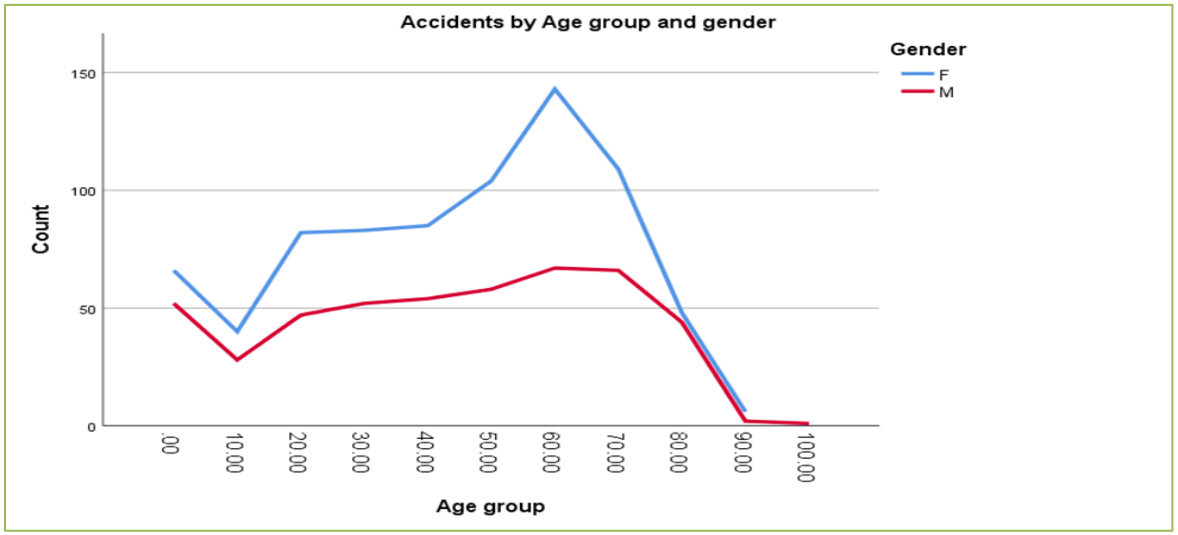
• Sydney (practical assessment at 80 (now 85)) **more collisions than Melbourne** (no age related assessment) (Langford et al., 2004)

- But are we testing the right thing?
  - There are some positive effects found for single measures, such as **vision testing (from N.America)**, and **restricted driving (Australia)** (and mostly for the oldest age groups).

A note on alternatives to the car

Issues with railway services

1. Older people overrepresented in accident figures, especially older women. Boarding/alighting but also using stairs and outside ticket office
2. Ticketing too complex
3. Difficulties when things go wrong
4. Signage, lighting, crowding.



✓ – Large signage
✓ – Signs Repeated

✗ – too much signage

✗ – glare

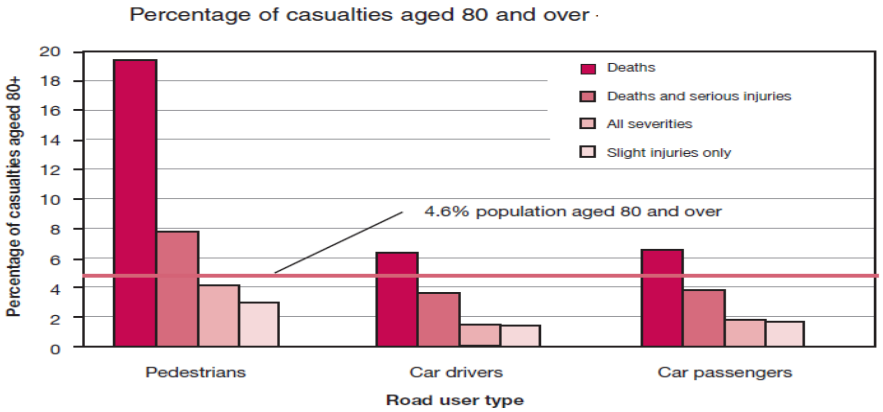
Bus use

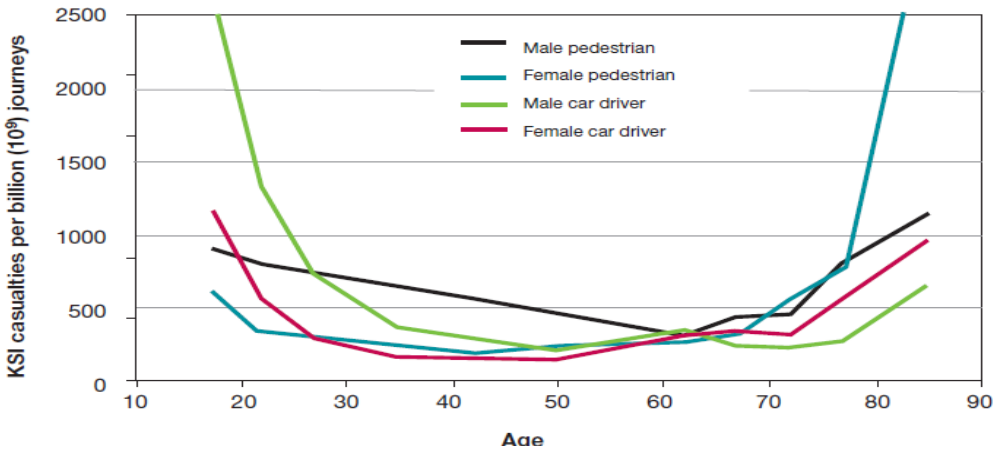
Over 60s in GB	GB
Population	24.4%
Use (in miles)	23.10%
KSI as a bus user	**43.29%**
Killed as a bus user	**100%**

- Over represented in KSI and Killed
- Boarding/alighting
- Standing up while bus is going

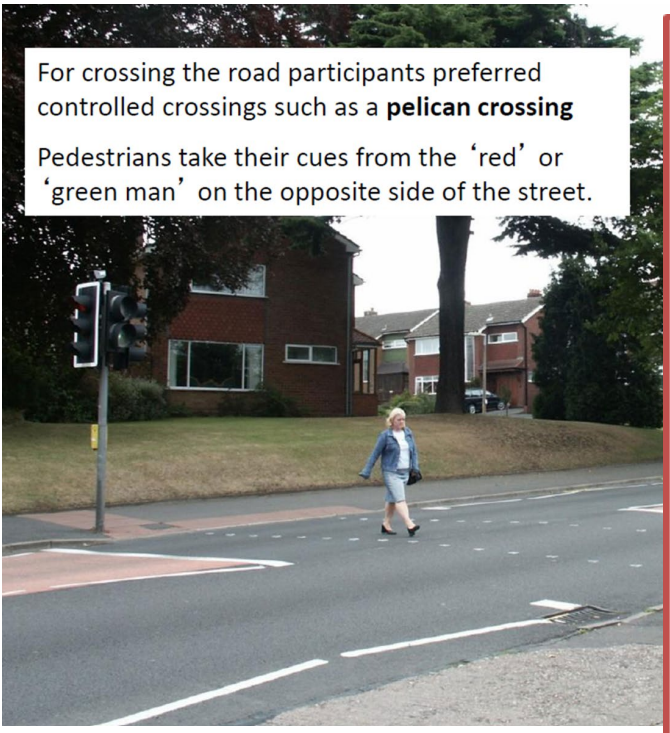
Walking

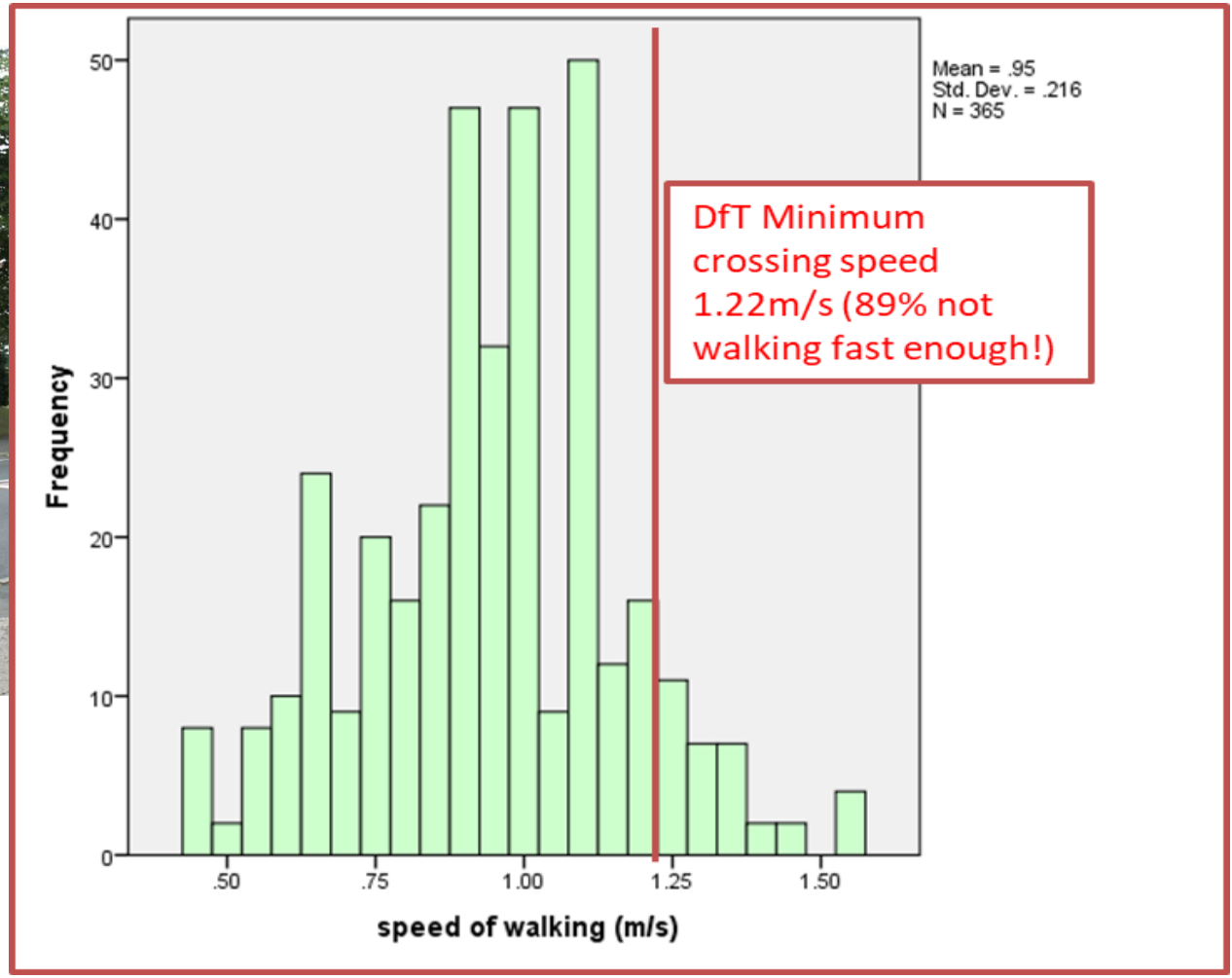
Over 60s in GB	GB
Population	24.4%
Pedestrian miles	22.22%
KSI as a pedestrian	**27.26%**
Killed as a pedestrian	**34.57%**





Crossing the road

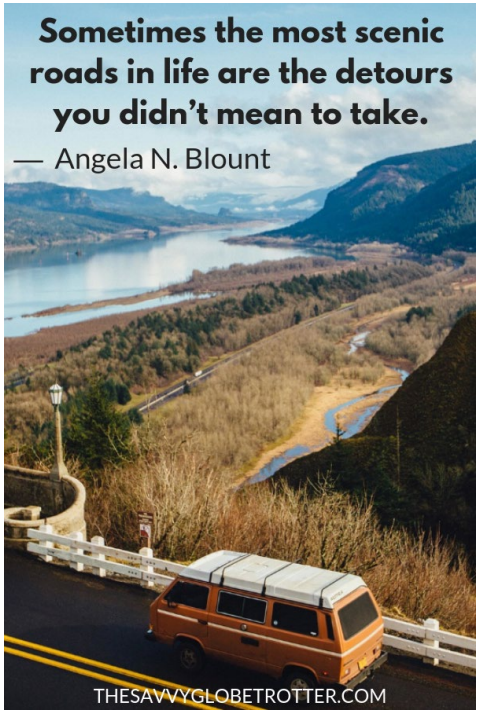




""For me as a fairly fit 70 yr old trying to keep fit, the main problem with transport is the roads and traffic lights being designed to prioritise motor vehicles. As a cyclist I frequently find a traffic light starts changing as I cross it, and has completely changed by the time I get to the other side - traffic has started moving into me before I am safely across. As a pedestrian we seem to have to wait longer and longer at crossings before the lights change. Dangerous and inconsiderate driving is an everyday menace."

- **Older drivers are generally safe**
  - **Protect themselves by selecting when to drive (but professional drivers can't)**
  - **Escalation of commitment, fatigue, turning right across traffic and eyesight all key issues**

- **Really difficult to identify when these become an issue**
  - **Role for increasing awareness and paying attention to feedback**
  - **Training and education for skills**
  - **Improving roads and vehicles – but not the Musk effect**
  - **Medical screening and testing – evidence for eyesight but not much else**



- **Alternatives**
  - **Not really catering for an old person**
  - **Can increase danger**

- **Solutions to helping people give-up driving**
  - **Multi-sectorial working – health, sustainability, gerontology, gerotarics, transport safety, transport planning**
  - **Involve older people in developing solutions**

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