

Traffic Engineering in the age of autonomous vehicles



GHD Transportation

Graham McCabe

Service leader transport optimisation and
planning

Utopia

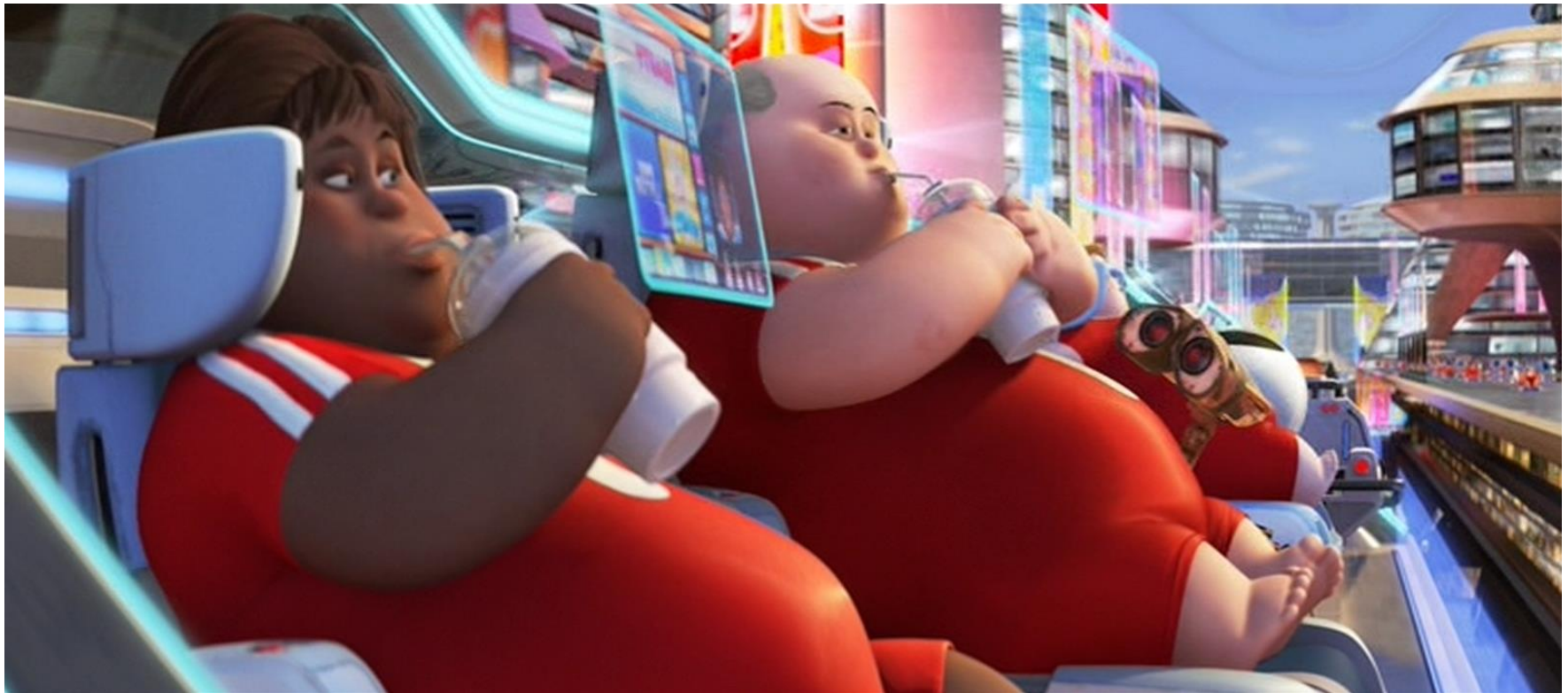
CITY OF TOMORROW

with autonomous cars



https://www.youtube.com/watch?v=EMD_0SjzTcA

A different utopia



<https://scifiinterfaces.files.wordpress.com/2014/01/walle-hoverchair05.jpg>

Autotopia is not a Disneyland ride (well, it is. But...)



<http://disney-md.wikia.com/wiki/Autopia>



“Efficient, reliable, safe and well-planned transportation systems are fundamental to a community’s economic prosperity and quality of life.”

“The need to feel safe and enjoy the spaces we live in is fundamental to human nature.”

“Urban space should invite people to urban life”

“Cars do not belong in human spaces”

Are we there yet?



<https://drivingtothefuture.wordpress.com/tag/prague-taxi/>



www.businessinsider.com.au

Not quite – but not far away?



www.technewstoday.com



Future trips

Option 1

1 car 1 owner
Multiple trips

Option 2

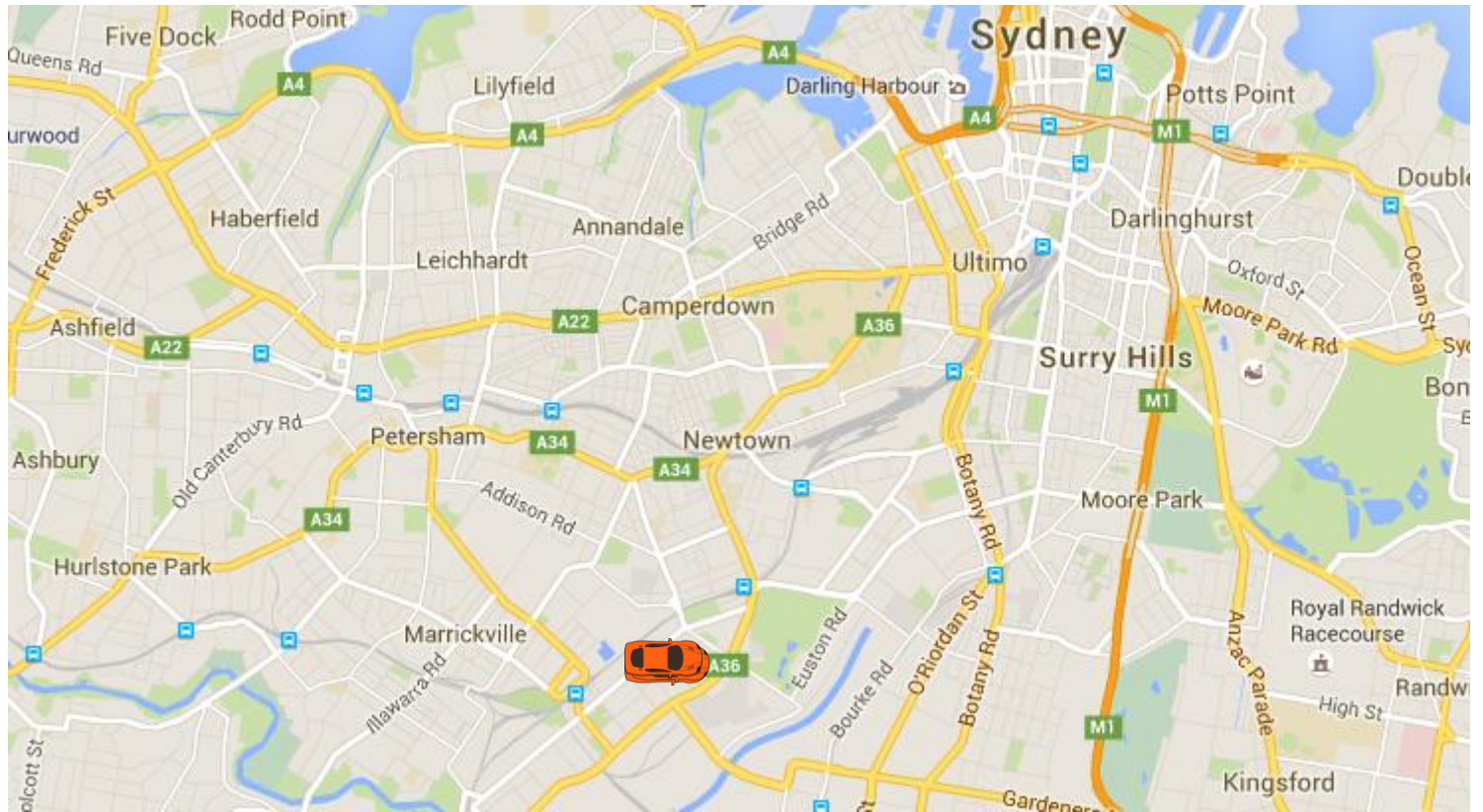
Co-op /
commercial

Multiple trips

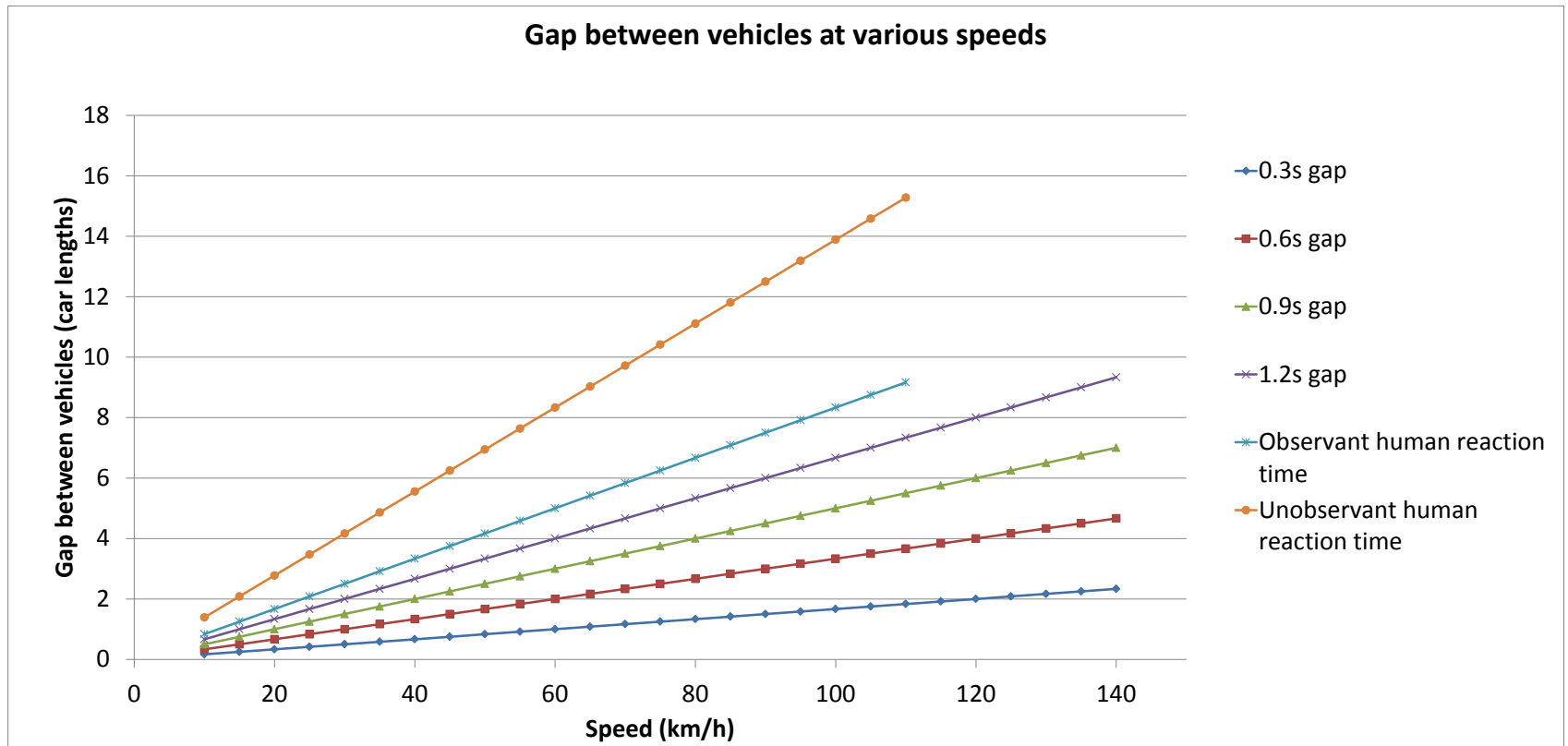
Option 3

Co-op /
commercial

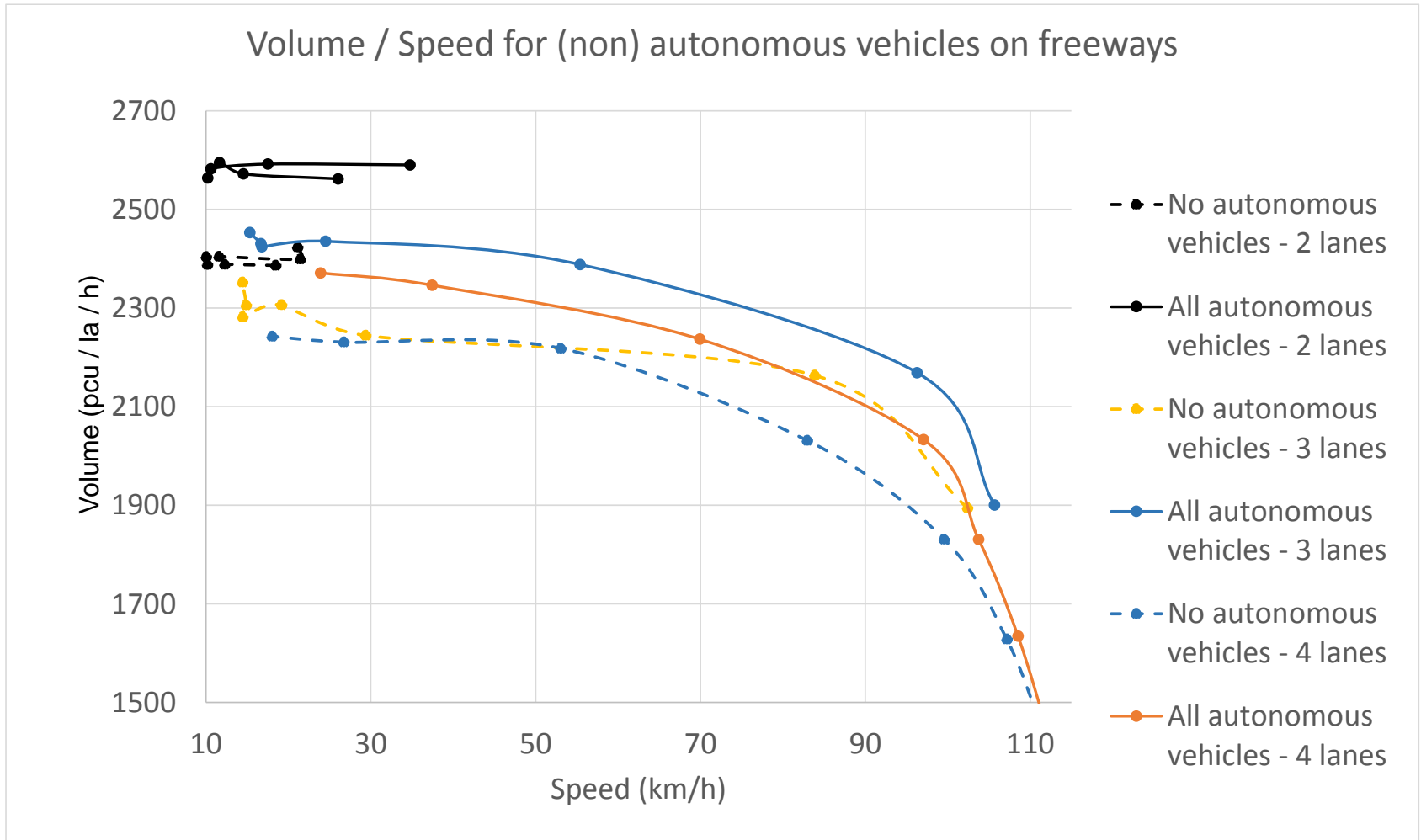
Multiple trips /
Multiple
vehicles



Freeway management



Traffic capacity



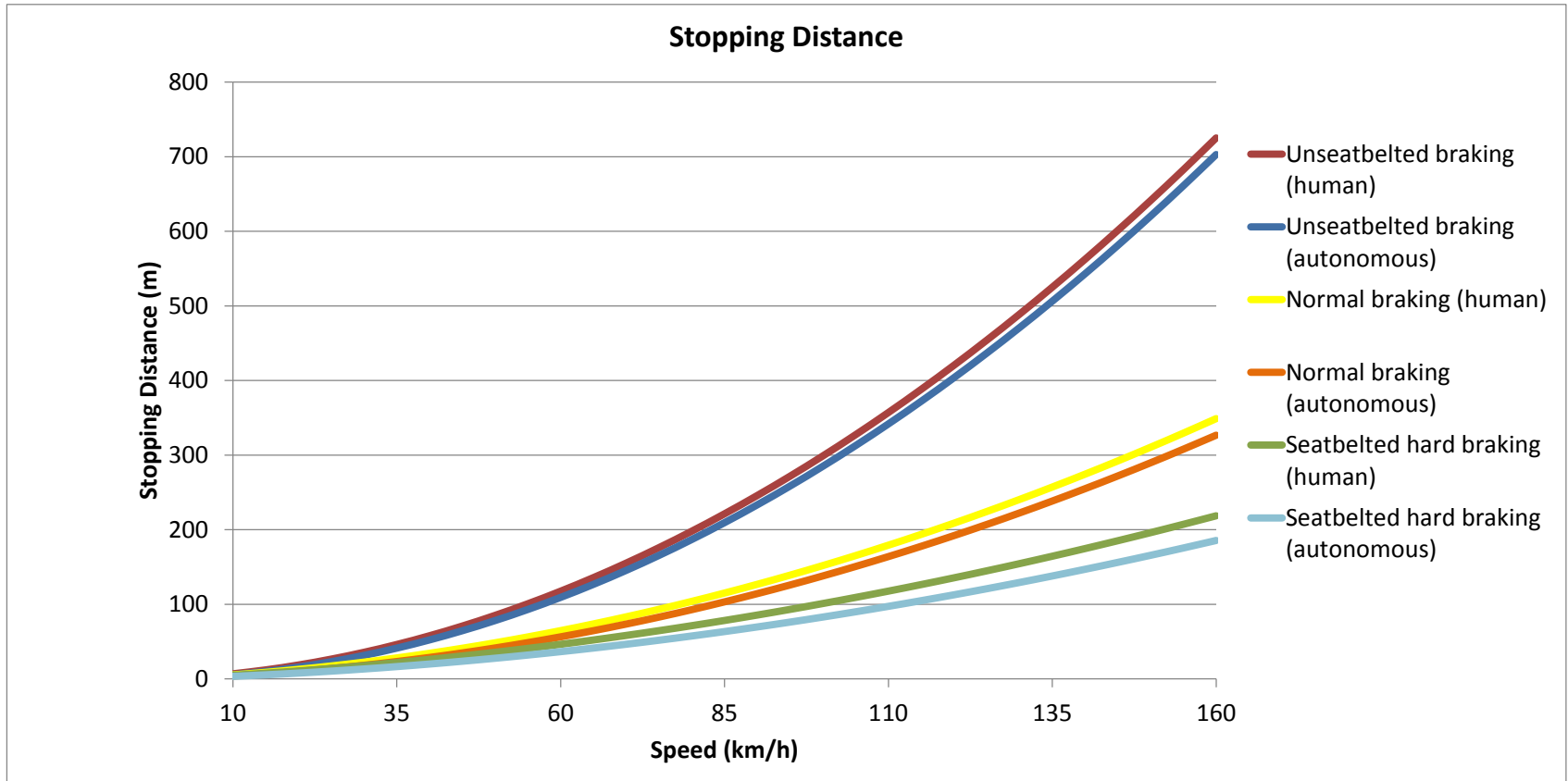
Traffic capacity



Traffic Safety



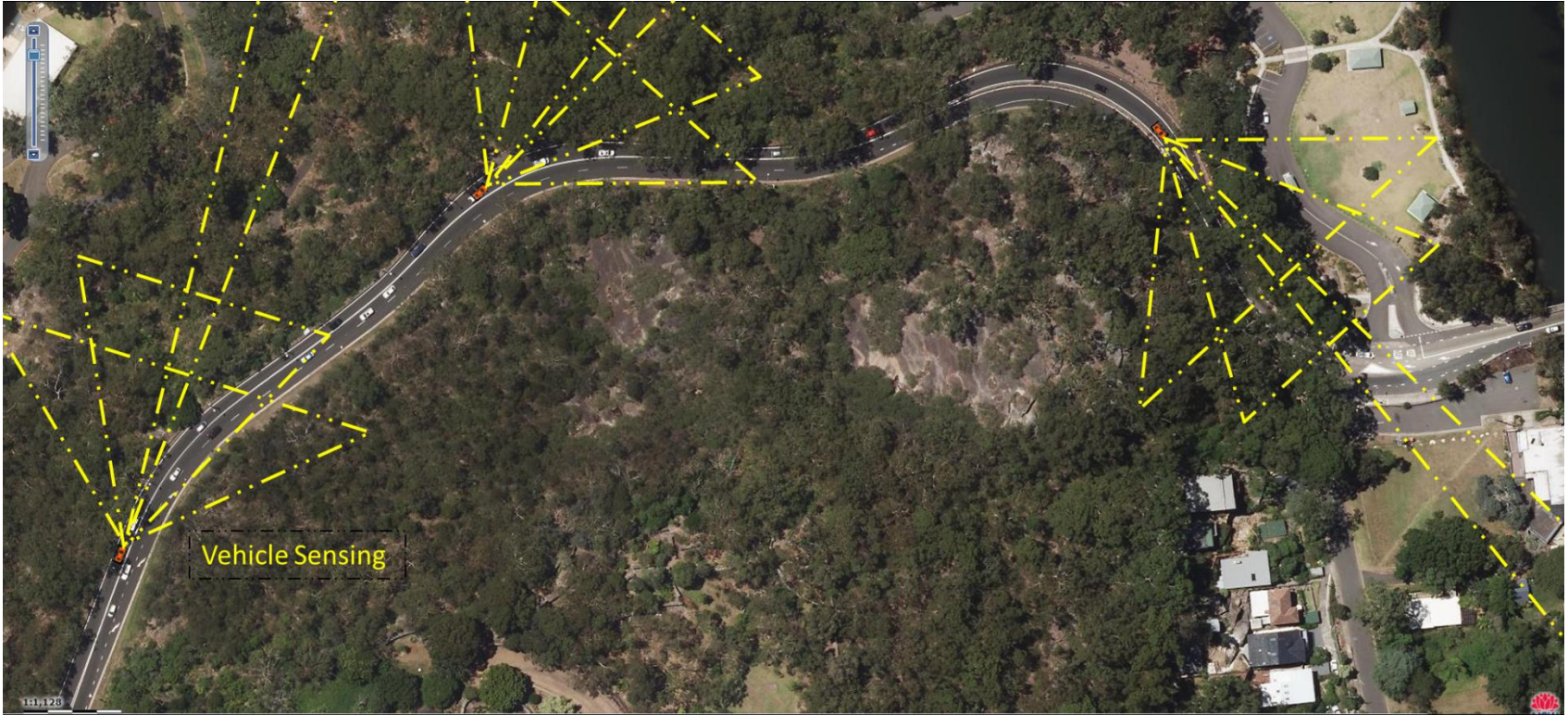
Traffic safety



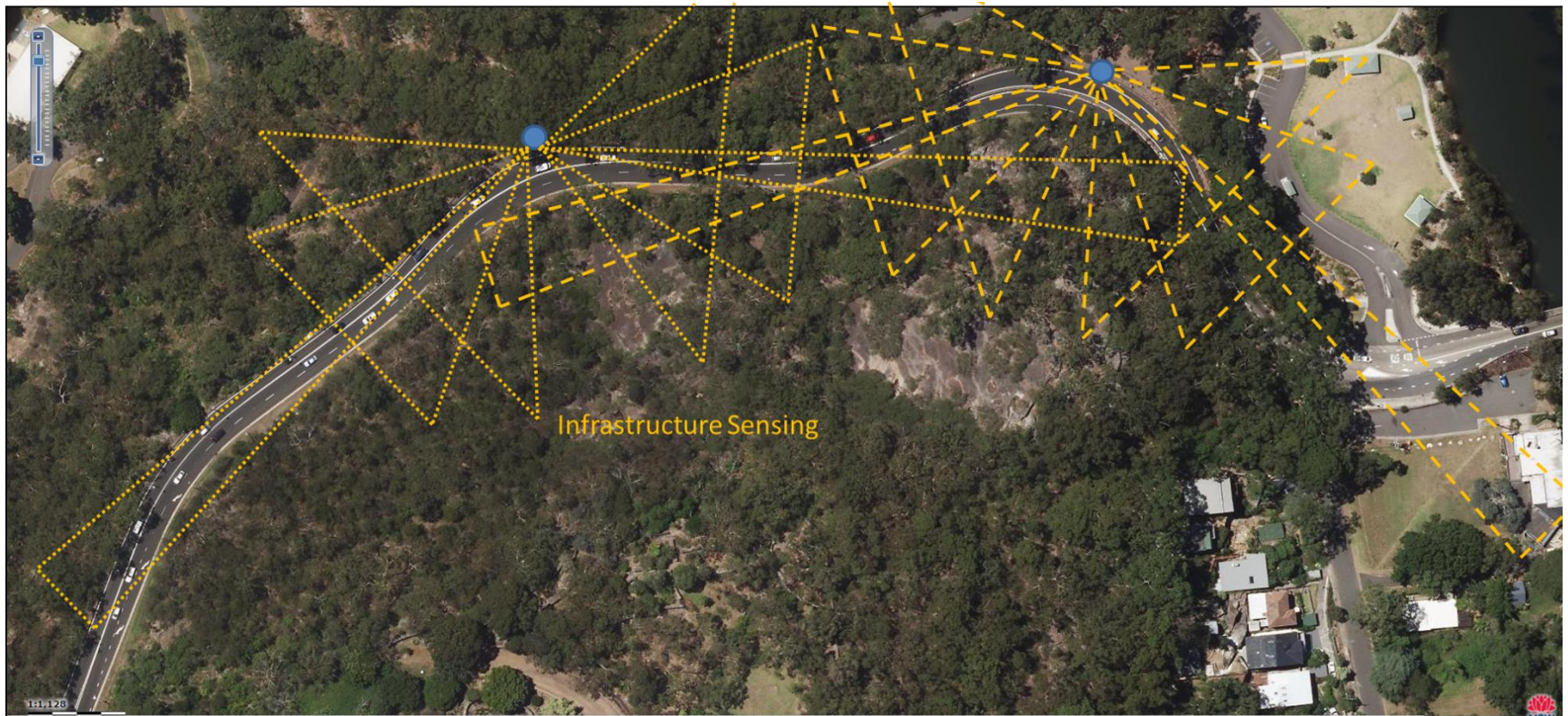
Traffic safety



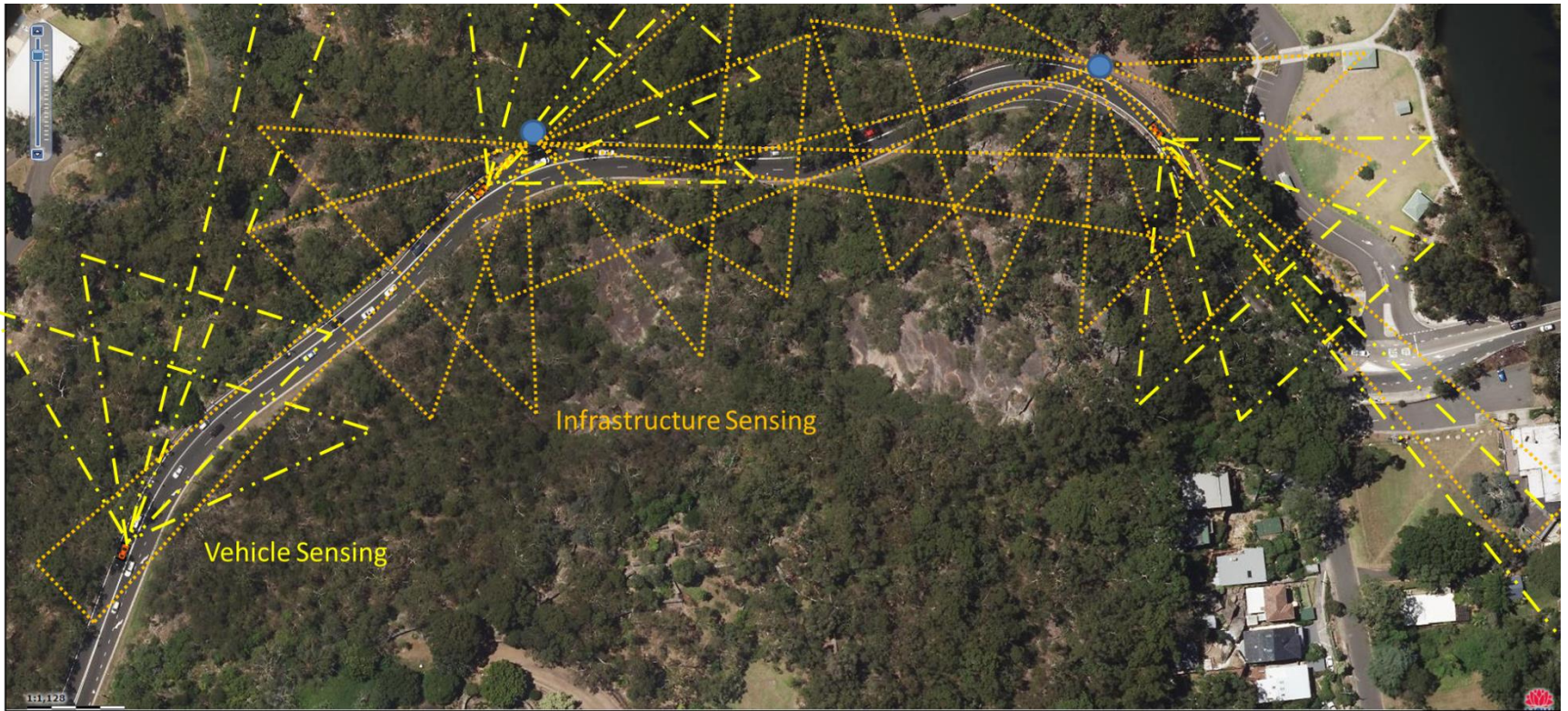
Traffic safety – unconnected individual vehicles



Traffic safety – unconnected infrastructure



Traffic safety – connected vehicles and infrastructure



Traffic safety – system



Freeways



<https://www.youtube.com/watch?v=lxKdUIEECN8>



Heavy vehicles and freeways

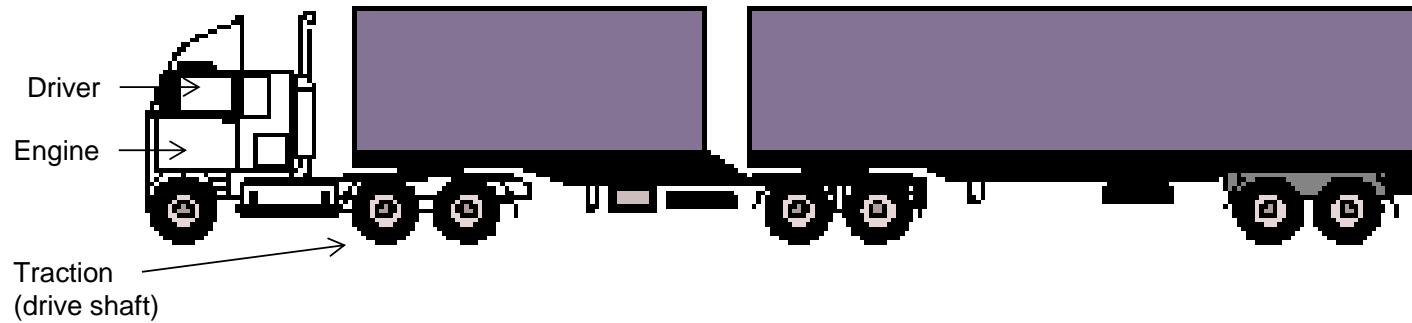


<https://www.youtube.com/watch?v=auPyP2qfudk>

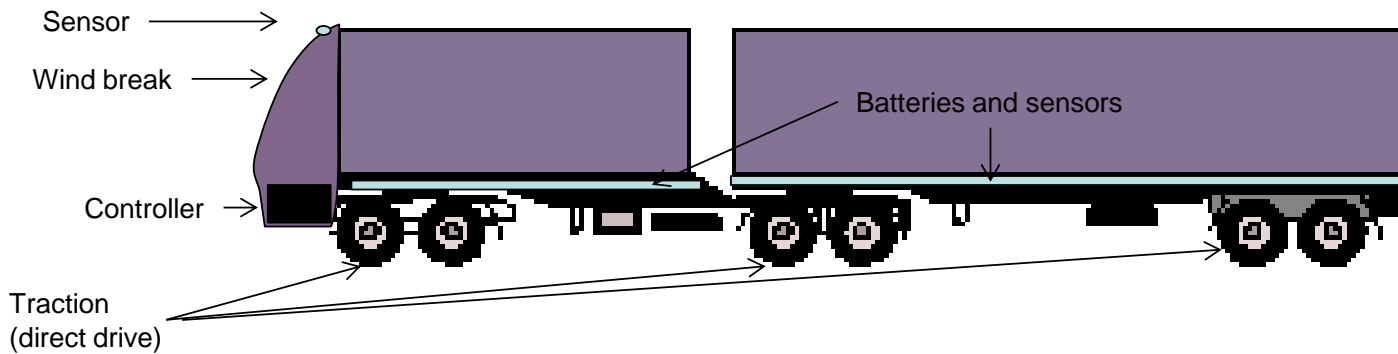


Heavy vehicles and freeways

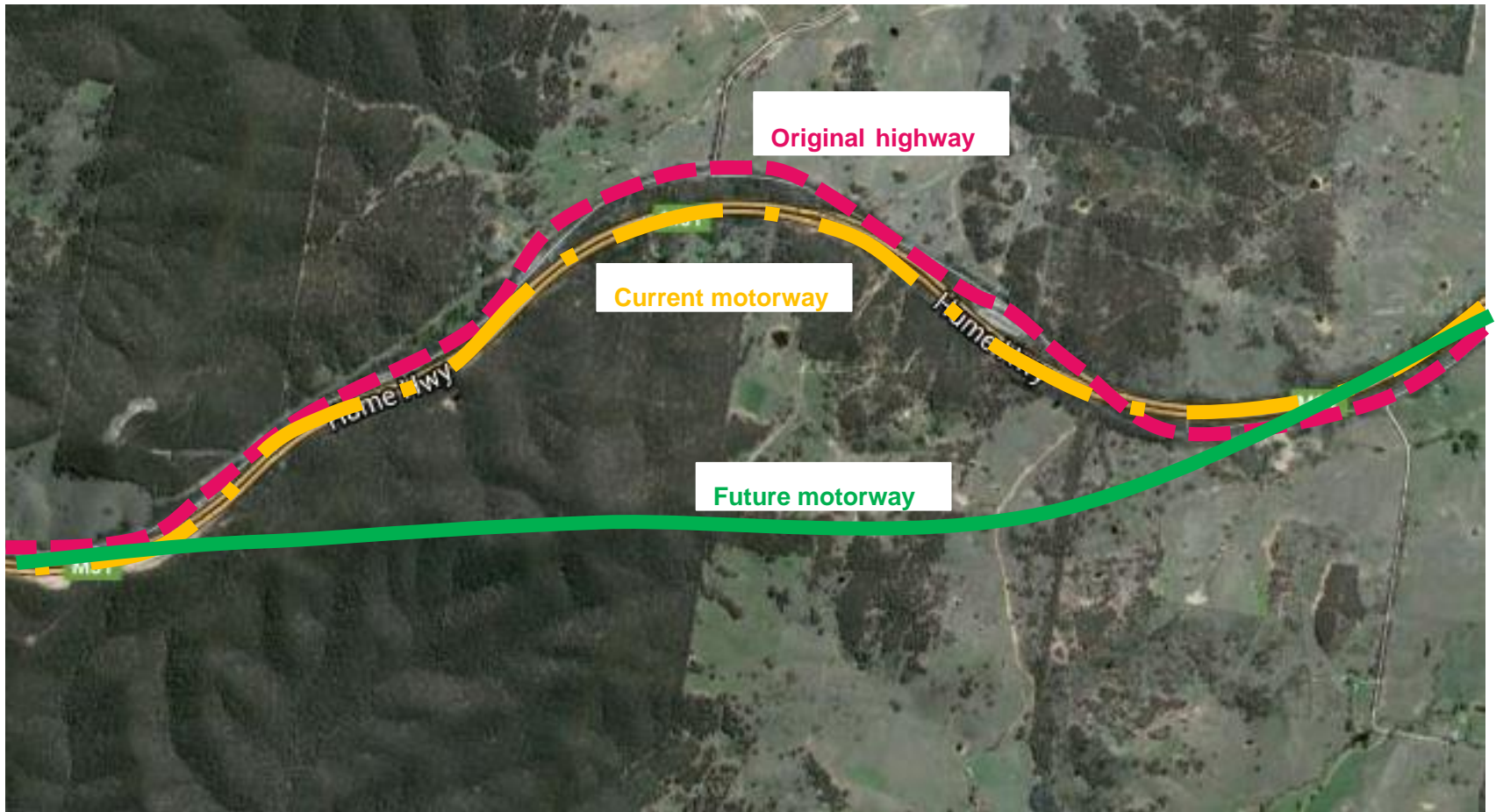
Current B-Double



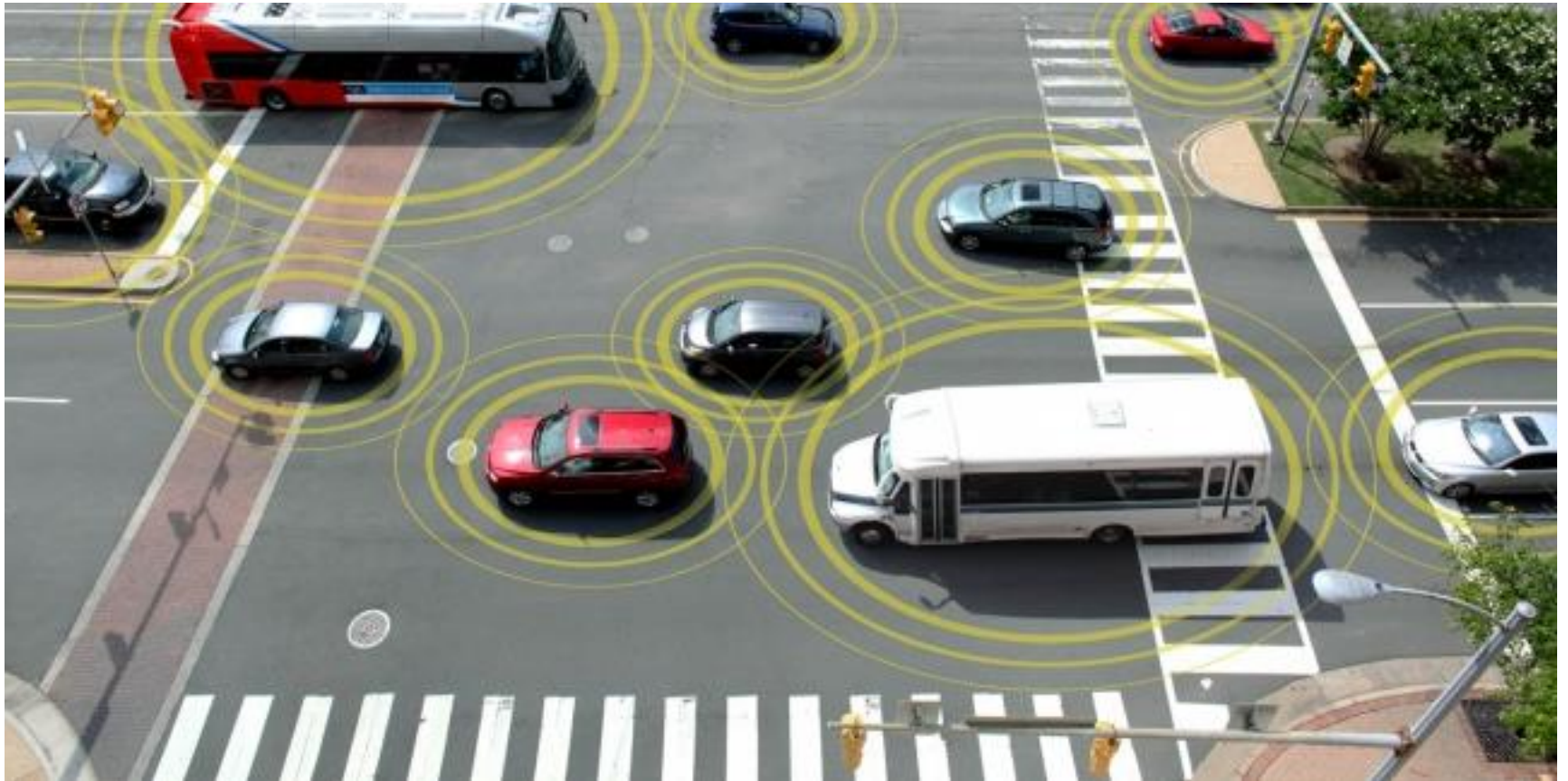
Autonomous B-Double



Freeway road design



Traffic management



Rewriting traffic rules

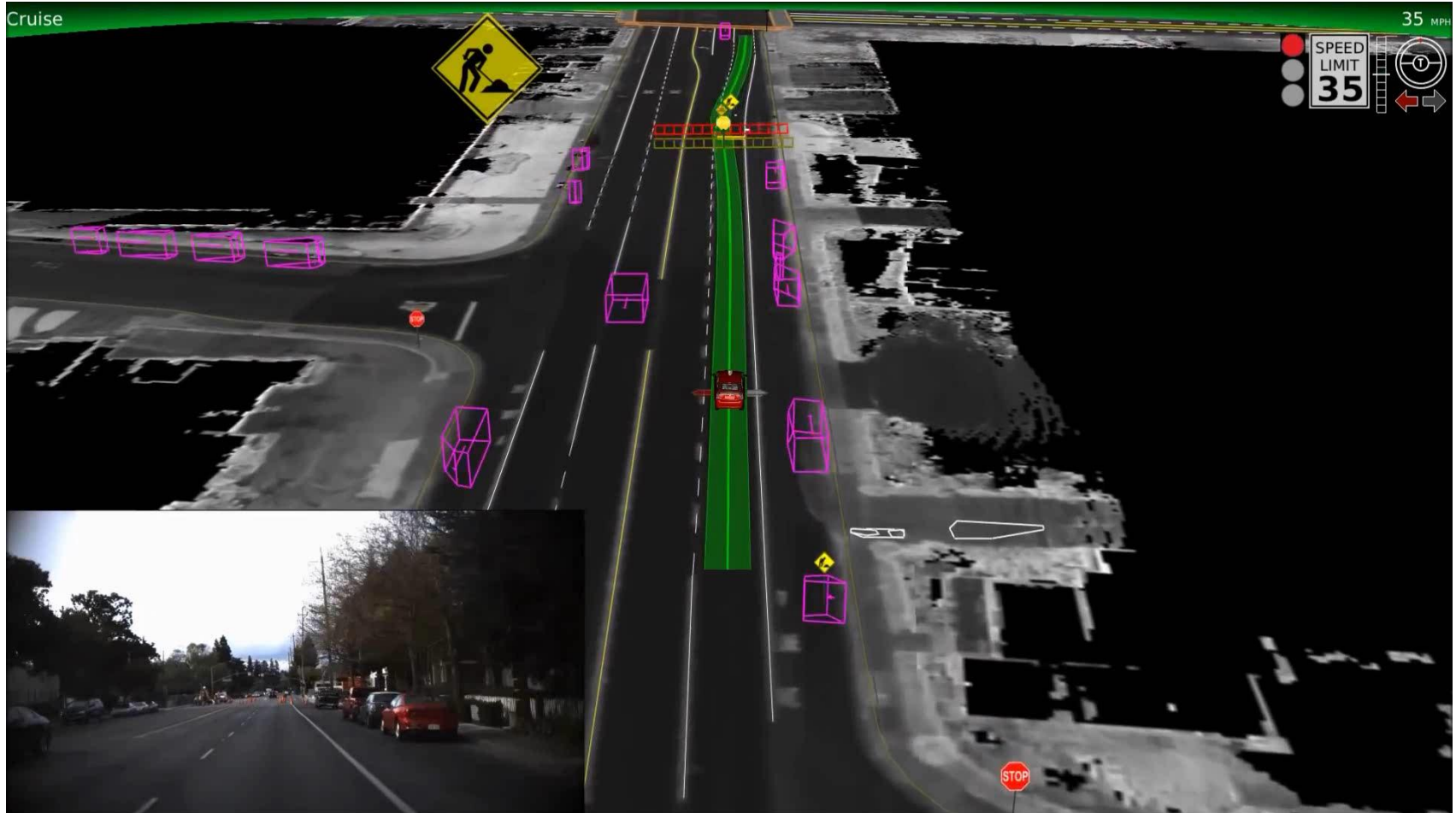


Rewriting traffic rules



<http://newsroom.macleay.net/wp-content/uploads/2012/10/J-Walkers-by-Natasha-Chadwick-2012102561.jpeg>

Rewriting traffic rules



<https://www.youtube.com/watch?v=lxKdUIEECN8>



Urban road design



<http://sydneycycleways.net.au>

Existing road hierarchy

Location	Function	Priority
Local Street / CBD	Access	Pedestrians / bicycles / public transport / deliveries
Collector / Distributor Road	Access / Transition / Traffic	Public transport / Freight distribution
Sub Arterial	Transition /Traffic	Intra city movement
Arterial	Traffic	Intra city movement / high volume
Motorways	Traffic	Inter City movement / high volume / high speed

Autonomous Road hierarchy

Location	Function	Priority
Local Street / CBD	Human scale movement	Pedestrians and bicycle priority
Lower activity urban streets	Access / Transition	Pedestrians / bicycles / lower speed autonomous vehicles (30 km/h speed limit)
Collector / Distribution Street	Transition	Pedestrian areas separated from roadway by cycleways / wide verges / bus ways
Automated Roads	Traffic	Intra city movement / high volume
Motorways	Traffic	Inter City movement / high volume / high speed

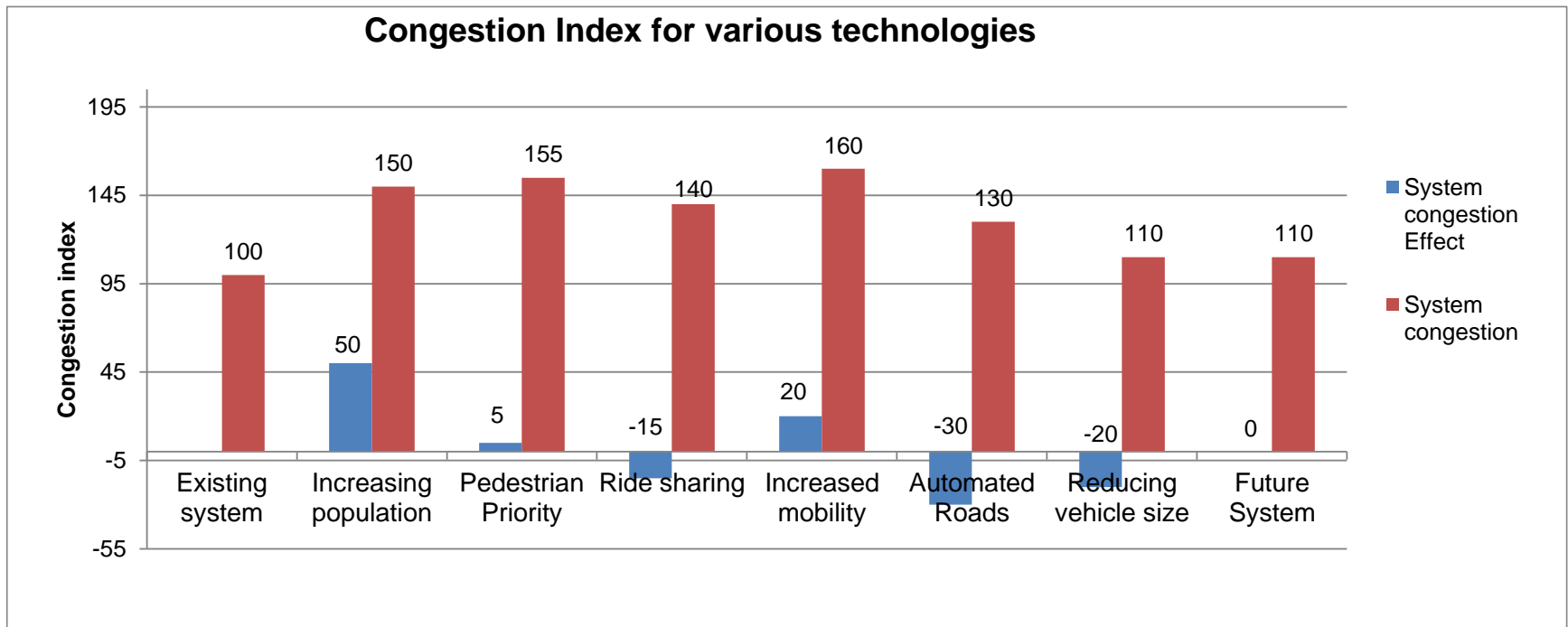
Urban Development



Future development



Transport system demands



Summary

- Autonomous vehicles are not a panacea
- Public transport is still necessary
- Human spaces need to be protected
- Land use requirements for parking need to be re-thought



www.ghd.com