Samuel Bailey
Bug-e

#20mphconf
Beyond Road Safety

Dr Samuel Bailey
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http://bug-e.city
Lowering maximum speeds isn’t just about reducing casualties...

• Lower speeds = lower CO2, NOx and PM emissions

• Lower maximum speeds are the enabling action needed to move our cities beyond cars...
The myth that ‘cars are more efficient at 56mph’…

...is nonsense

• Petrol engines are more efficient the closer they are to their maximum power output.

• But...
  • In urban driving, vehicles repeatedly accelerate and decelerate. It requires 2.25x the energy to accelerate to 30mph compared to 20mph.
  • It requires 2.25x the energy to push the air out of the way at 30mph than at 20mph.

• So which one wins?
Energy required at different maximum speeds
In urban driving, fuel efficiency is highest at 15-20mph top speed

https://futuretransport.info/urban-traffic-research/
And NOx and CO2 are minimised at 15-20mph

Can we see the effect on PM 10 emissions?


Mats Gustafsson. Factors Influencing PM10 emissions from road pavement wear. https://www.academia.edu/30756528/Factors_influencing_PM_10_emissions_fro
What about the effect of 20mph limits on journey times?
What about the effect of 20mph limits on journey times?
Quick note on road safety and speed...
10mph

(simulations created using BeamNG)
15mph
20mph
25mph
30mph
16mph (real footage)
23mph (real footage)
29mph (real footage)
31mph (real footage)
So what do Wide Area Low Speed Zones (WALZ) enable?

• Bikes
• E-scooters
• Something else.....

Introducing Low Impact Vehicles:
If I know that all vehicles are doing 20mph, I don’t need a vehicle designed to do 120mph.

• 10x less lithium, nickel and cobalt consumed during manufacture than a full sized EV.
• 10x less energy consumed during manufacture than a full sized EV
• 3x less CO2 per mile from electricity generation than a full size EV, 6x less CO2 per mile than a petrol car.

For a full discussion of future mobility options, please read https://futuretransportresearch.medium.com/a-roadmap-for-revolutionising-urban-road-transport-4f8a3fc5f93c
- Friendlier to pedestrians, cyclists and the city
- More acceptable to have drive through your LTN.
- 4x higher parking density
- Charges from a regular extension cable.
- Increases road capacity - 2 to 2.5 times as many NEVs can cross a green light as full size vehicles.
- If we all drove a bug-e at 15mph, we’d get to work quicker than everyone driving at 30mph in full size cars...
bug-e.city

• Share scheme available early next year.
• Pilot in Hammersmith and Fulham
• Could we bring them to Oxford?