Title: Smarter regulation: proposed changes to legislation for electrically assisted pedal cycles **IA No:** DfT00467 **RPC Reference No:** N/A **Lead department or agency:** Department for Transport **Other departments or agencies:** N/A	**Impact Assessment (IA)** **Date:** 21 September 2023 **Stage: Consultation** **Source of intervention: Domestic** **Type of measure: Secondary Legislation** **Contact for enquiries:** EAPCConsultation@DfT.gov.uk

Summary: Intervention and Options

RPC Opinion: N/A

Cost of Preferred (or more likely) Option (in 2019 prices)			
Total Net Present Social Value	**Business Net Present Value**	**Net cost to business per year**	**Business Impact Target Status**
Not monetised	Not monetised	Not monetised	N/A

What is the problem under consideration? Why is government intervention necessary?

E-cycles can address the problems of ill-health, air pollution, carbon emissions and congestion, which are caused by externalities in the transport market. Some groups of people (for example older people, disabled people or people with mobility impairments) and freight operators seeking to move heavier loads are less likely or able to cycle without the electrical assistance provided by e-cycles and e-cargo bikes. Since current regulatory standards limit the power of e-cycles, government intervention is necessary to address this.

What are the policy objectives and the intended effects?

The policy objective is to increase usage of electrically assisted pedal cycles (EAPCs) and therefore contribute to the benefits of active travel in terms of improving health outcomes, reducing air pollution and carbon emissions, and cutting congestion. Increasing the power and throttle assistance of e-cycles should make them more accessible for different groups of people, including disabled people, older people and people with mobility impairments in addition to making e-cycles more attractive travelling in hilly areas. The proposals should also support freight operators use e-cargo bikes as it will help e-cargo riders transport freight with greater use, including for heavier loads and uphill.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Four options have been considered:

- Option 0 – Do Nothing;
- Option 1 – Increase EAPC power limits;
- Option 2 – increase EAPC throttle assistance without type approval; and
- Option 3 (the preferred option) – combination of options 1 and 2. Increasing both EAPC power limits and throttle assistance without type approval (option 3) may lead to greater increase in EAPC use and resulting benefits in term of health outcomes, reducing emissions and cutting congestion.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date: June 2030**

Does implementation go beyond minimum EU requirements?		N/A		
Is this measure likely to impact on international trade and investment?		Yes		
Are any of these organisations in scope?	**Micro** Yes	**Small** Yes	**Medium** Yes	**Large** Yes
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)		**Traded:** Not known	**Non-traded:** Not known	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible: LUCY KAVANAGH Date: 21 September 2023

Deputy Director - Environment and Future Mobility Analysis, DfT

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	**High:** Optional	**Best Estimate:** n/a

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional	Optional	**Optional**
High	Optional	Optional	**Optional**
Best Estimate	n/a	n/a	**n/a**

Description and scale of key monetised costs by 'main affected groups'

No costs have been monetised at consultation stage.

Other key non-monetised costs by 'main affected groups'

Businesses will be affected by the regulatory change as it will allow them to bring new products to the UK market. This may entail financial costs to manufacturers if they choose to re-engineer a product, or where existing products can be redirected to the UK market. Consumers / transport users may face health costs if they switch from a mode of travel that is more active or safer, or environmental costs if switching from a mode with a lower impact.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	**Optional**
High	Optional	Optional	**Optional**
Best Estimate			

Description and scale of key monetised benefits by 'main affected groups'

No benefits have been monetised at consultation stage.

Other key non-monetised benefits by 'main affected groups'

The public at large may experience: (i) environmental improvements if transport users switch from higher emitting modes; (ii) health benefits if switching from less active or less safe modes; (iii) congestion benefits if switching from private car use. Consumers may also experience a welfare improvement due to expanded product choice and businesses may experience increased revenues/profits if the change leads to greater demand for e-bikes.

Key assumptions/sensitivities/risks **Discount rate (%)**

The scale of the impacts depends on key assumptions which we are currently unable to evidence, including:

(i) the number of trips currently taken by e-cycles;

(ii) how businesses will respond to the regulatory change;

(iii) how transport users will respond to the availability of new products.

The key risk that has been identified is around the possibility of negative road safety consequences from the proposed changes.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: n/a	**Benefits:** n/a	**Net:** n/a	

E.0 Policy Rationale

Policy background

Active travel agenda

1. The government's second cycling and walking investment strategy[1] (CWIS2) sets out its commitment to active travel. This includes making walking, wheeling and cycling the natural first choice for shorter journeys and for half of all short journeys in towns and cities in England to be walked, wheeled or cycled by 2030.
2. This will help achieve important benefits for improving health, reducing emissions, cutting congestion and making local areas more attractive places to live and work. The government's objectives for active travel are underpinned by its projected investment of over £3 billion up to 2025, and the creation of Active Travel England, a new executive agency, which is delivering its programme with local authorities to improve active travel across the country.

Electrically assisted pedal cycles

3. Electrically assisted pedal cycles (which we will interchangeably refer to as EAPCs or e-cycles) can play a key role in increasing cycling levels and supporting the government's objectives for active travel. In particular, e-cycles can make cycling more accessible. They provide assistance for cycling longer distances or riding up hills, which can make an important difference for anyone who may be older, disabled or have mobility impairments. E-cycles can also help cyclists that need to ride in business clothes without breaking sweat.

E-cargo bikes

4. E-cargo bikes can deliver the objectives and benefits of active travel as electrical assistance helps riders of cargo bikes transport goods with greater ease. In particular, the use of e-cargo bikes by freight and logistics operators can reduce congestion from other vehicles and improve air quality. To support the development of e-cargo bikes, the government has invested in supporting businesses and local authorities to transition to more sustainable business travel and last mile deliveries through e-cargo bike grants, including £2.6 million for local authorities from 2 rounds of funding administered by the Energy Savings Trust between 2019 and 2022[2,3].

Current regulations on classification of electrically assisted pedal cycles

5. Current EAPC regulations[4] (as amended in 2015[5]) set out the requirements an EAPC has to meet so as to fall outside the definition of motor vehicle contained within the Road Traffic Acts and to be treated as a cycle. The requirements are that the:
    - cycle must be fitted with pedals that are capable of propelling it;

[1] The second cycling and walking investment strategy (CWIS2) - GOV.UK (www.gov.uk)
[2] eCargo Bike Grant Fund information - Energy Saving Trust
[3] E-cargo bikes: grant funding - GOV.UK (www.gov.uk)
[4] The Electrically Assisted Pedal Cycles Regulations 1983 (legislation.gov.uk)
[5] The Electrically Assisted Pedal Cycles (Amendment) Regulations 2015 (legislation.gov.uk)

- maximum continuous rated power of the electric motor must not exceed 250 watts; and
- electrical assistance must cut-off when the vehicle reaches 15.5 mph (25 km/h).

6. An EAPC that complies with the above is not considered to be a motor vehicle within the meaning of the Road Traffic Regulation Act 1984[6] and the Road Traffic Act 1988[7]. EAPCs therefore are not required to be registered or subject to vehicle excise duty (road tax) and do not have to be insured as a motor vehicle.
7. The Road Traffic Act 1988 however sets out that EAPCs must not be ridden by anyone under the age of 14 years.
8. EAPCs are treated the same as pedal cycles in terms of what infrastructure they may use and can therefore use cycle lanes, tracks and other cycle facilities.

Current regulations on throttle assistance

9. EAPCs that provide electrical assistance without the use of pedals are usually known as "twist and go" e-cycles. It is possible to use these cycles in the same way as any other EAPC, however under assimilated EU Regulation 168/2013[8], vehicles with throttle assistance above 3.73 mph (6 km/h) require type approval.
10. Type approval is provided via the Vehicle Certification Agency and is there to ensure that a vehicle meets certain technical requirements. This is normally achieved at the manufacturing stage, but importers and individuals will be able to seek an individual approval for vehicles that have not been type approved.

Problem under consideration

11. The government wants to support increased levels of active travel and has set ambitious targets for this through CWIS2 because of the benefits that mode shift from other modes to active travel can achieve by addressing problems such as ill-health, air pollution, carbon emissions and congestion.
12. E-cycles can help increase the levels of cycling and therefore contribute to achieving these important benefits. E-cycles make cycling more accessible for different groups of people, including older people, disabled people or people with mobility impairments, who may otherwise be less likely or able to cycle. E-cycles can also increase the use of cargo bikes (in the form of e-cargo bikes) and contribute to mode shift away from motor vehicles for transporting freight.
13. It is therefore important that the government supports the use of e-cycles to achieve their potential benefits. Reviewing the regulations for e-cycles is central to this and the proposed changes of increasing the power and throttle assistance limits for e-cycles have been identified as ways of increasing e-cycle usage.

Rationale for intervention

14. Many travel options create negative environmental externalities from emissions of greenhouse gases and air pollutants. The cost of these pollutants on society is not fully

[6] Road Traffic Regulation Act 1984 (legislation.gov.uk)
[7] Road Traffic Act 1988 (legislation.gov.uk)
[8] Regulation (EU) No 168/2013 of the European Parliament and of the Council of 15 January 2013 on the approval and market surveillance of two- or three-wheel vehicles and quadricycles (Text with EEA relevance) (legislation.gov.uk)

factored into transport users' decisions, causing them to be over-used relative to the social optimum. This intervention is aimed at reducing this market failure by removing barriers to the adoption of e-cycles and e-cargo cycles, which eliminate or greatly reduce in-use emissions. The regulatory barriers in question can only be removed by government.

15. There may be public health benefits that accrue in the switch from non-active modes to e-cycles, since additional exercise is associated with a very wide range of improved health outcomes.

16. There may also be benefits from reduced congestion if this regulatory change encourages mode shift from cars and vans to e-cycles and e-cargo bikes.

17. The current regulations restrict the function and performance of e-cycles and e-cargo bikes and therefore potentially limits their use. The proposed government intervention to relax these restrictions and enable e-cycles with increased power and throttle assistance will help remove barriers that discourage their use, including for disabled people, older people, people with mobility impairments and freight operators. Removing these barriers and encouraging the use of e-cycles will help address externalities in the transport system, such as air pollution, carbon emissions and congestion.

18. DfT's wave 8 Transport Technology Tracker survey[9] (December 2021) suggests that only 3% of people aged 16+ in England own an e-cycle, compared to 47% who own a regular pedal cycle, and 94% of respondents said they had used an e-cycle less than annually or not at all. Those aged between 55-64 (6%), 65-74 (5%) and 44-54 (4%) were most likely to own e-cycles. Only 4% of the population that do not own an e-cycle reported being very or fairly likely to purchase one in the next 12 months.

19. DfT's wave 9 Transport Technology Tracker survey[10] (published in November 2022) found that the most cited disadvantages of e-cycles are that they are expensive to buy and likely to be stolen (mentioned respectively by 69% and 53% of respondents), while the most cited advantages were that they required less effort than a normal bike and their environmental benefits (mentioned respectively by 72% and 53% of respondents). 10% of respondents reported the view that e-cycles travel too fast.

Policy objective

20. The overriding rationale is to make EAPCs a more attractive and viable travel option for more people.

21. More specifically, increasing the power of EAPCs to 500 watts would make it easier for cyclists using EAPCs to ride up hills and gradients. This has the potential to enable more people to cycle, for example, if they live or work in areas with hilly terrain or they are less physically fit and would otherwise struggle to cycle up gradients.

22. EAPCs with 500 watts could be valuable for e-cargo bikes because it would better enable delivery riders to transport heavier loads, including on terrain with gradients. E-cargo bikes are a growing area of interest and operations for logistics organisations and have the potential to support efforts to cut congestion and improve air quality.

[9] https://assets.publishing.service.gov.uk/media/62723f0d8fa8f57a41d53ec8/technology-tracker-wave-8.pdf

[10] https://assets.publishing.service.gov.uk/media/63fe26afd3bf7f25fa417a19/transport-and-transport-technology-public-attitudes-tracker-wave-9-report.pdf

23. Allowing throttle assistance up to 15.5 mph (25 km/h) could help make EAPCs more accessible. In particular, some stakeholders have identified how this could enable some disabled people to use EAPCs as a mobility aid and give them greater choice for their personal transport. Higher throttle assistance could also support users that are older, less physically fit or have mobility impairments in addition to enabling e-cargo bike riders to transport goods with greater ease.

24. For example, wave 9 of DfT's Transport Technology Tracker report[11] (published in November 2022) showed that 45% of respondents selected "more accessibility for those with mobility issues" as an advantage of e-cycles. More specifically, e-cycle users with conditions or impairments that cause muscle weakness or fatigue (such as muscular dystrophy or chronic fatigue), severe mobility limitations (such as advanced arthritis), in addition to people with cardiovascular and respiratory conditions and individuals that need to carry medical equipment could benefit from e-cycles with increased throttle assistance. These benefits would also broadly apply to these users from increasing the power of e-cycles to 500 Watts with respects to cycling in areas with hilly terrain.

25. A throttle assisted speed of 15.5 mph matches the maximum pedal assisted speed and is also the speed that is currently allowed for approved 'twist and go' EAPCs. Therefore, no other speed options have been considered in the policy development.

26. E-cycle users could benefit from the proposals because it may reduce the costs of e-cycles by allowing a greater range to be imported and used. Enabling users to ride e-cycles with greater power or throttle assistance may also reduce the incentive for users to tamper with the settings of their e-cycles to achieve these and other objectives.

27. By helping more people to use EAPCs, the proposed changes could support the government's wider objectives for active travel and the underlying benefits for this agenda, including improving health outcomes, reducing emissions and cutting congestion. By supporting e-cargo bikes, the proposals could also benefit the government's Future of Freight plan[12] and in particular the use of urban consolidation centres.

Options considered

28. All of the options considered are non-regulatory as the measures are deregulatory.

29. **Option 0** – Do Nothing. It is expected that not changing the existing regulations for EAPCs would mean that levels of EAPC usage are less likely to increase and would therefore be less likely to deliver greater benefits in terms of health outcomes, reducing emissions and cutting congestion.

30. **Option 1** – to amend how EAPCs are classified so that the maximum continuous rated power of the electric motor must not exceed 500 watts instead of 250 watts as set out in the current regulations. This change to the regulations would make it easier for e-cycle users to ride up hills and gradients. It would also help e-cargo bike riders deliver heavier loads.

31. **Option 2** – to allow 'twist and go' EAPCs to have throttle assistance up to 15.5 mph (25 km/h) without the need for type approval, instead of 3.73 mph (6 km/h) as under the current regulations. This regulatory change would make using EAPCs more accessible, including for

[11] https://assets.publishing.service.gov.uk/media/63fe26afd3bf7f25fa417a19/transport-and-transport-technology-public-attitudes-tracker-wave-9-report.pdf

[12] https://www.gov.uk/government/publications/future-of-freight-plan

disabled people, older people and those with mobility impairments, in addition to allowing e-cargo bike riders transport freight with greater ease.

32. **Option 3 (preferred option)** – taking forward both options 1 and 2. Progressing both these changes to the existing regulations is expected to lead to a greater increase in EAPC use and greater resulting benefits compared to only taking forward option 1 or 2.

2.0 Costs and Benefits

33. This consultation-stage impact assessment has identified a number of important gaps where more evidence is sought:

a. **Do you have any evidence on the current size of the e-cycle stock owned by UK transport users and the total annual trips made?**

b. **Do you have any evidence on the current size of the e-cycle market in the UK, including manufacturing volumes, or its potential future growth rate?**

c. **Do you have any estimate of the response that e-cycle manufacturers will have to the proposed regulatory changes and any costs and benefits associated with that response? Do you have any evidence on whether and how market prices for e-cycles might be affected?** To note, the proposed regulatory changes are deregulatory. Manufacturers will not be required to produce e-cycles with increased power or throttle assistance and they will be able to continue producing e-cycles they currently manufacture (for example e-cycles with 250 Watt electric motors).

d. **Specifically in respect of the proposed regulatory changes, do you have any estimate of the response of consumers and transport users to any change in e-cycle function and performance – in particular, how it might affect the number of trips taken?**

e. **Do you have any evidence on the number and size of businesses that might be affected by these proposals – in particular, whether small and micro businesses may be affected?**

f. **Do you have any evidence on what impact these proposals might specifically have on disabled people?**

g. **Do you have any evidence on what impact these proposals might specifically have on e-cargo bike users?**

Option 0 – Do Nothing

34. In the absence of the proposed regulatory change we would expect the e-cycle and e-cargo cycle market to continue its growth trajectory (noting that the COVID period was exceptional). However, some users that might have otherwise adopted e-cycles or e-cargo cycles may not do so – for example, disabled users or some logistics and delivery businesses.

Options 1, 2 and 3 – Increase maximum EAPC power and throttle assistance speed

35. Options 1, 2 and 3 are considered together since the categories of impact are similar.

Summary

36. The impacts of this regulatory change can be roughly categorised into the following types:

- **Financial / resource impacts on businesses** where manufacturing processes are altered and where some part of this cost is passed on to retailers, or where demand for e-cycles increases revenues
- **Financial impacts on consumers** where the average price of an e-cycle is affected
- **Environmental impacts** related to any mode shift encouraged by this regulatory change – emissions of greenhouse gases, particulate matter and NOx
- **Public health impacts** related to any mode shift encouraged by this regulatory change – differences in exercise / activity and accident rate / severity
- **Congestion impacts** related to any mode shift encouraged by this regulatory change
- **Welfare improvements** where previously unavailable consumption choices become available to consumers that prefer them

Monetised Costs

37. At consultation stage we have not monetised any costs as some critical evidence (on manufacturer responses and associated costs, and the effect of the regulatory change on e-cycle uptake) is missing. We will seek to obtain this evidence through consultation, allowing many of the costs below to be monetised.

Unmonetised Costs

38. **Financial / resource costs to businesses (direct)**. While the proposed regulatory change is permissive in nature (i.e., no businesses are forced to change their behaviour), they may nonetheless lead to changes in the manufacturing process that incur either transitional or ongoing costs. Only the costs to domestic manufacturers would be included in this impact assessment. Additional costs may be minimal if manufacturers are already producing products for other markets that can simply be directed to the UK. We will seek to improve our understanding of what these costs might be and how many businesses could be affected through the consultation process. Domestic retailers may also bear some of this cost to the extent that it is passed on down the supply chain.

39. In addition, some UK manufacturers and retailers may face transitional costs if they have significant inventories of lower-powered e-cycles and face competition from overseas suppliers with immediate access to stock of higher-powered e-cycles. We will use any relevant evidence from consultation responses to monetise this impact.

40. **Financial costs to consumers (direct)**. If changes to manufacturing processes incur additional costs then this could affect the average price of an e-cycle. This will depend on the level of competition in the retail market – if this is high it is unlikely that small changes in manufacturing costs will significantly affect the retail price. If competition is low then the introduction of a greater range of products could have the effect of keeping prices down.

41. **Public health costs (direct)**. If this regulatory change encourages increased uptake of e-cycles by shifting transport users from another mode, this could have both positive and negative impacts on public health since:
    - some modes are less active than e-cycling (car, LGV, public transport) and others could be more active (regular pedal cycle, walking, existing EAPCs)
    - different modes have different rates and severity of collisions – Section 3 highlights potential safety risks raised by this proposal due to increased speeds and heavier loads
42. **Environmental costs (direct)**. If this regulatory change encourages increased uptake of e-cycles by shifting transport users from another mode then this could entail an environmental cost if users switch from modes with lower environmental impact (primarily pedal cycles and walking). The electricity usage of e-cycles will be associated with emissions of GHGs, up until net zero power is achieved in the UK. Once we have a stronger idea of the extent to which mode shift may occur, these benefits can be monetised using diversion factors and standard factors for emissions from Transport Appraisal Guidance (TAG) and other evidence sources.

Monetised Benefits

43. At consultation stage we have not monetised any benefits as a critical assumption (the effect of the regulatory change on e-cycle uptake) is missing. We will seek to obtain information on this assumption through consultation, allowing many of the benefits below to be monetised.

Unmonetised Benefits

44. **Financial benefits to businesses (direct)**. If the regulatory changes proposed have a positive impact on demand for e-cycles then this may increase revenues and profits for producers and retailers. This could be offset by reduced demand for other vehicle types. In addition, new e-cargo cycle specifications may introduce options for logistics and delivery businesses that are more profitable (without closing off any existing options).
45. **Environmental benefits (direct)**. If this regulatory change encourages increased uptake of e-cycles by shifting transport users from another mode, this may have a positive environmental impact if users switch from a mode with worse environmental impacts. Once we have a stronger idea of the extent to which mode shift may occur, these benefits can be monetised using diversion factors and standard factors for emissions from Transport Appraisal Guidance (TAG) and other evidence sources.
46. **Public health benefits (direct).** As above, mode shift towards e-cycles could have both positive and negative effects on health and these can be monetised once we have an estimate of the extent of mode shift.
47. **Congestion benefits (direct).** If this regulatory change encourages some trips taken by private car to be replaced with e-cycling trips then there will likely be some degree of benefit from reduced congestion. Since these benefits are likely to be fairly small and would require a complex transport model to estimate, they are likely to remain unquantified in this impact assessment.
48. **Welfare improvements (direct).** Current regulations mean that some types of vehicle may not be available to all consumers. Where availability is expanded and some consumers are

able to choose new preferred options, this is likely accompanied by an increase in consumer welfare (i.e., the total excess of consumer willingness to pay over the total of consumer spending). This is likely to remain an unmonetised benefit as it will be difficult to estimate the shape of the demand curve.

Key evidence needs:

49. **The current size of the e-cycle stock owned by UK transport users and the total annual trips made**. E-cycles are a relatively new technology and little robust information has been collected about the current stock and usage. Wave 5 of the National Travel Attitudes Study (2021)[13] included questions about e-cycles and found that 3% of respondents owned an e-cycle, while 1% had regular access to one. This excluded respondents stating that their disability made cycling impossible. The survey did not ask how often e-cycles were used or for what type of trips. In terms of e-cargo cycles, a 2019 consultation asked respondents to indicate how many e-cargo cycles make up their fleet, leading to the conclusion that 'the e-bike sector is starting from a low base with the majority of e-cargo fleets under ten bikes.'[14]

50. **The current size of the e-cycle market in the UK, including manufacturing volumes**. Based on import statistics,[15] the market for e-cycles in the UK increased substantially during the COVID pandemic (~60,000 units imported in 2017, compared to ~150,000 units in 2020).

51. **An estimate of the response that e-cycle manufacturers will have to the proposed regulatory change and any costs associated with that response**. Manufacturers of e-cycles could adopt one of three broad strategies in response to this regulatory change: (i) make no changes to the products that they offer in the UK market; (ii) re-engineer the products currently offered in the UK market to increase motor power and/or allow throttle assistance up to 15.5mph; (iii) redirect existing products offered in other markets with greater motor power and/or throttle assistance towards the UK market. Strategy (ii) is likely to be the most costly option, but we do not currently know which strategy (or mix of strategies) is most likely.

52. **An estimate of the response of consumers and transport users to any change in e-cycle function and performance – in particular, how it might affect the number of trips taken**. Subject to the strategy adopted by businesses, consumers (including individuals and businesses that need transport services) may be faced with new product choices (and prices) following this regulatory change. The three most likely outcomes are: (i) consumers may not notice the changes and, therefore, not alter their behaviour; (ii) consumers with an existing intention to purchase an e-cycle now purchase a 500W cycle instead of a 250W cycle; (iii) consumers that did not previously plan to purchase and/or use an e-cycle or e-cargo cycle may choose to do so if a new product enabled by this change better meets their needs, thereby increasing e-cycle trips and mode shift. We do not currently have evidence on which of these outcomes might prevail, or in what proportions, nor the possible extent of increased demand in outcome (iii). The National Travel Attitudes Study[16] found that the

[13] DfT (2021), National Travel Attitudes Study: Wave 5, https://www.gov.uk/government/statistics/national-travel-attitudes-study-wave-5/national-travel-attitudes-study-wave-5#electric-bicycles-e-bikes
[14] DfT (2019), Government Response to Call for Evidence The Last Mile – Delivering goods more sustainably, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786879/last-mile-call-for-evidence-government-response.pdf
[15] Bicycle Association (2021), Quarterly Import & Export Report: Quarter 1 2021
[16] DfT (2021), National Travel Attitudes Study: Wave 5, https://www.gov.uk/government/statistics/national-travel-attitudes-study-wave-5/national-travel-attitudes-study-wave-5#electric-bicycles-e-bikes

financial cost of an e-cycle is currently the greatest barrier to uptake, but this did not ask about different product specifications.

53. Some key pieces of evidence and assumptions are used in thinking about various costs and benefits:

54. **Diversion factors**. If new e-cycle trips are generated as a result of the regulatory change, we have to consider what other modes those e-cycle trips switched from in order to understand the impact. A variety of studies have examined this question and a recent Rapid Evidence Review[17] commissioned by DfT summarises the literature on cycling diversion factors, which a specific section on e-cycles. There are relatively few studies of this (still emerging) technology and many of the studies are limited in their applicability either because samples were small and/or not representative, or because the evidence is from shared cycling schemes or non-UK studies. The most suitable estimates seem to be those from Bikeplus,[18] which are from English locations and cover a comprehensive list of modes – but these are also limited since they are based on an e-cycle sharing scheme only, and are now several years old. These diversion factors are reproduced below.

Mode	**Percentage of trips previously made by mode**
Car driver	35%
Own bicycle	19%
Bus	16%
Walking	15%
Car passenger	6%
Taxi	4%
Train	4%
Car club car	1%
Total	100%

55. Note that this does not include e-cycle trips that would not have previously been made by any other mode. Wave 8 of DfT's Transport Technology Tracker survey[19] found that the main reason for using an e-cycle was for fun (67%) which suggests they may not substitute other trips.

56. For e-cargo cycles the same diversion factors would not apply as these trips have a very different purpose. In the absence of any evidence it seems reasonable to assume that new trips by e-cargo would have otherwise been carried out in an LGV. A response from TfL to a 2019 consultation[20] indicated that e-cargo cycles could carry loads of 100-300kg compared to 600kg in a small van. Therefore, each van trip could be replaced by between 2 and 6 e-cargo cycle trips. This conversion will have to account for the new maximum power of e-cargo cycles being proposed. For example, if loads of 600kg become feasible then each van

[17] DfT (2023), Cycling diversion factors, https://www.gov.uk/government/publications/cycling-diversion-factors
[18] Bikeplus (2016), Findings and Recommendations from Eleven Shared Electric Bike Projects. Shared Electric Bike Programme Briefing. 62dabeef4b3f6d4db2ce7042_CoMoUK Shared Electric Bike Programme Report 2016.pdf (webflow.com).
[19] https://assets.publishing.service.gov.uk/media/62723f0d8fa8f57a41d53ec8/technology-tracker-wave-8.pdf
[20] DfT (2019), Government Response to Call for Evidence The Last Mile – Delivering goods more sustainably, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786879/last-mile-call-for-evidence-government-response.pdf

trip would be equivalent to between 1 and 6 e-cargo cycle trips. Consultation responses may inform an estimate of potential behaviour change by cargo businesses.

57. **Emissions Factors**. The TAG data book[21] provides all of the necessary assumptions to calculate GHG emissions factors for all modes, except e-cycles. For the latter, an estimate of power usage per mile will allow the calculation of a GHG emissions factor. Similarly, air pollutant emissions (particulate matter and NOx) can be calculated for all modes using the TAG data book and Defra's Emissions Factor Toolkit.[22] Although cycles may generate some particulate emissions (e.g., from tyre and brakewear) these can be considered negligible for simplicity.

58. **Health impacts**. TAG also provides the assumptions needed to estimate most of the health impacts associated with cycles – both improved life expectancy due to exercise and the effect of collisions. A key area where more evidence is needed is on the relative impact of e-cycles on health and accidents compared to regular pedal cycles and the extent to which the proposed regulatory changes could also affect this.

Business Impact Target Calculations

59. As outlined above, further evidence is needed to be able to quantify the net costs to businesses. We will use the consultation to develop this evidence base and calculate an EANDCB for the final stage IA.

3.0 Risks and unintended consequences

60. The department is aware of some potential disadvantages to the proposals and would be interested in stakeholders' views on them.

61. Increasing the power of e-cargo bikes would enable them to carry heavier loads which could increase the potential severity of injury caused to pedestrians and cyclists in collisions. Greater usage of e-cargo bikes could also increase the number of collisions, but this could be mitigated if it reduces other forms of freight traffic.

62. There may be greater safety risks where more powerful or heavier EAPCs interact with other road users, particularly where they are ridden on shared-use cycle tracks alongside pedestrians and are used illegally on the pavement. More powerful EAPCs will be able to accelerate more quickly and travel up hills and gradients at faster speeds. This could lead to EAPCs overtaking pedal cycles and other road users more frequently.

63. Increasing the power limit of EAPCs will increase their uncapped speed if they are tampered with so that electrical assistance does not cut-off at 15.5 mph as required. This would increase road safety risks significantly, including from collisions. Riding EAPCs that have been tampered in this way is illegal and police forces are able to enforce this.

64. Increasing throttle assistance may reduce the health benefits from pedalling, but it could lead to more people cycling and cycling for longer distances, including by pedalling.

65. There may be a risk of more severe battery fires from more powerful e-cycles and this could be exacerbated by tampering. This will be considered as part of cross-government work into

[21] DfT (2023), TAG data book, https://www.gov.uk/government/publications/tag-data-book
[22] NAEI (2021), Emissions factors for transport, https://naei.beis.gov.uk/data/ef-transport

the safety of lithium-ion batteries used by e-cycles, which for example includes the recent publication of safety guidance on how to safely purchase, charge and use e-cycles.

4.0 Wider impacts

Innovation Test

Our preliminary assessment is that the proposed change will have a neutral or positive impact on innovation. The regulation in question relates to a specific technology, but the change proposed expands the range of products that can be brought to market in line with this regulation.

Small and Micro Business Assessment

Three main types of businesses may be affected by this regulatory change:

i. Manufacturers of e-cycles and e-cargo cycles

ii. Retailers of e-cycles and e-cargo cycles

iii. Logistics and delivery businesses that currently use e-cargo cycles or might choose to do so

As the market for these vehicles remains nascent and small, we do not currently have detailed information about the number and size of businesses in each category, but it is likely that some small or micro businesses could be affected.

Since the proposed change is permissive in nature and does not necessitate any change in business behaviour, we believe it is unnecessary to exempt small and micro businesses. The change expands the options available to businesses and should, therefore, be non-negative in its impact.

Some costs may be incurred – for example, by manufacturers if they choose to re-engineer a product – but these are not necessitated and we expect they would be incurred in expectation of commensurate benefits.

A full SaMBA will be produced for the final stage impact assessment, incorporating consultation responses.

Equalities Impact Assessment

It is expected that the proposed changes to EAPC regulations will have some benefits for disabled people and older people. Increasing the speed of throttle assistance for EAPCs will enable disabled people to use EAPCs for their mobility. Increasing the power of EAPCs will allow users to travel uphill with greater ease. The proposed changes will therefore give disabled and older people greater choice for their personal transport.

The proposed changes may lead to some road safety risks which could potentially have a particular impact on disabled people or older people. For example, if e-cycles are used inappropriately on the footway, older people may be affected more severely by collisions and may pose greater safety risks to blind people. E-cycles with increased power may also pose control challenges, especially for users with balance or coordination issues.

The Equalities Impact Assessment (EqIA) for the proposals will be developed further after the consultation by drawing on the responses to the consultation questions and any evidence provided from this.

Justice Impact Test

A Justice Impact Test will be considered with Ministry of Justice for the final stage after the consultation. The responses to the consultation questions and any evidence provided from this will be evaluated as part of this.

Trade Impact

It is not believed that the proposed changes will cause a barrier to trade as the changes are permissive in nature. However, the department will notify the World Trade Organization (WTO) in line with its requirements and consider all responses.

5.0 Post implementation review

1. **Review status:** Please classify with an 'x' and provide any explanations below.

	Sunset clause		Other review clause		Political commitment		Other reason		No plan to review

2. **Expected review date** (month and year, xx/xx):

0	6	/	3	0

Five years from when the Regulations come into force

3. **Rationale for PIR approach:**

The scale of impact from the proposals is uncertain. Therefore, it is assumed that the post-implementation review will require a "medium" level of evidence (as set out in the Guidance for Conducting Regulatory Post Implementation Reviews[23]).

The post-implementation review of the proposals could include a number of different methods.

The review will include the evaluation and analysis of relevant data regarding both the prevalence and road safety statistics for cycling and e-cycles.

Prevalence of cycling and e-cycles

- Evaluating existing datasets collected through the National Travel Survey[24] regarding cycling and e-cycles, for example regarding the number of trips and stages, and by different groups of people (e.g. disabled people and older people).
- Collaborating with industry stakeholders to collect data on the use of e-cargo bikes by freight operators and logistics companies.
- Liaising with industry stakeholders to obtain data on the export, import and sale of e-cycles and e-cargo bikes.

Road safety statistics for cycling and e-cycles

- Evaluating existing datasets collected regarding road casualties and analysing casualties involving cycles, including for different groups of people (e.g. by age and sex)

[23] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/879444/Magenta_Book_supplementary_guide._Guidance_for_Conducting_Regulatory_Post_Implementation_Reviews.pdf

[24] National Travel Survey - GOV.UK (www.gov.uk)

- Considering whether and how to collect data in future specifically regarding casualties involving e-cycles and for different groups of people (e.g. disabled people and older people).

We will engage stakeholders to collect evidence for the post-implementation review. This could include conducting interviews with stakeholders that represent cycling groups, retailers, manufacturers, disability groups, freight operators, fire and road safety groups, the police and local government. These interviews will improve our understanding of the impacts that the proposals have had on different stakeholders, including the impacts on health outcomes, road safety and freight operations.

Based on the available evidence, the costs and the benefits of the proposals will be assessed in order to evaluate their value for money.

Our proposed approach for the post-implementation review will be refined in due course. It will be developed further for the Impact Assessment developed after the consultation and will draw on evidence provided by stakeholders in their consultation responses. The approach for the review will be considered further and finalised nearer to the date of the review.

Key Objectives, Research Questions and Evidence collection plans			
Key objectives of the regulation(s)	**Key research questions to measure success of objective**	**Existing evidence/data**	**Any plans to collect primary data to answer questions?**
1. Increase levels of cycling and usage of e-cycles 2. Increase levels of cycling and usage of e-cycles by different groups of people, including disabled people, older people and people with mobility impairments	1. Has there been an increase in the number of trips, stages and distance travelled by cycling and e-cycles 2. Has there been an increase in the number of trips, stages and distance travelled by cycling and e-cycles for disabled people, older people and people with mobility impairments	National Travel Survey	The National Travel Survey already collects data for these research questions.