



## Law Commission's Automated Vehicles Review - Consultation 2 - Uber submission

Uber welcomes this second opportunity to comment on the United Kingdom's regulatory framework for automated vehicles. Automated vehicles ("AVs") will play an important part in the UK's future transport mix and have the potential to significantly improve road safety, helping to reduce road fatalities -- approximately 90% of which involve human error. As such, Uber shares the Law Commission's objective of ensuring the safe and expeditious roll-out of AVs.

As this consultation process recognises, the safe deployment of AVs turns not only on the development of this technology, but on the development of an appropriate mechanism for safely providing AV rides to passengers. Uber is committed to the safe development of such mobility-as-a-service opportunities, incorporating autonomous vehicles as a safe and reliable option for increasing transportation opportunities.

### I. About Uber

Uber is a technology company whose mission is to create opportunity through movement. In the UK, Uber's current offerings include:

- **'Rides'**, which allows consumers to tap a button for a safe, affordable and reliable ride from a fully licensed driver in over 40 towns and cities;
- **'Eats'**, an on-demand food delivery app and website which connects local restaurants with consumers; and
- **'Jump'**, which provides users with access to a network of dockless e-bikes.

In 2015, Uber founded Uber's Advanced Technologies Group (ATG) in Pittsburgh, Pennsylvania, USA, with the aim of bringing self-driving technology to the Uber digital network.

Uber ATG is now actively developing self-driving technology in two models:

- i) **Fleets of vehicles equipped with Uber's own self-driving technology made available via the Uber platform:** We work with vehicle and equipment manufacturers in the process of integrating our technology into a base vehicle; and
- ii) **Fleets of vehicles equipped with other developers' self-driving technology made available via the Uber platform:** Partners or third parties develop, own and operate vehicles equipped with their own technology, which riders can access via the Uber app once the vehicle satisfies certain safety and user experience conditions.

We are now actively testing our self-driving system on-road in Pittsburgh. In addition, we are conducting manual operations in San Francisco, California, Toronto, Ontario, and Dallas, Texas, collecting the local data needed to further promote our development efforts.

At Uber, we seek to ignite opportunity by setting the world in motion. Self-driving technology holds the potential to play an important role in that vision, by increasing transportation access, safety, and quality.

We believe the best way to harness the power of self-driving technology for broad public benefit is to deploy it in managed fleets of shared vehicles equipped with Level 4 capability technology. We believe that a shared-fleet approach that integrates numerous transportation options has the potential to:

- Improve road safety as computers can look in all directions at once and do not get distracted, fatigued or impaired;
- Improve access to technology which is otherwise prohibitively expensive for personal ownership, thereby familiarising consumers with this technology and speeding up adoption;
- Encourage a shift away from private car ownership, thereby reducing the size of the vehicle fleet and the amount of space required for parking;
- Minimise transport inequality by extending the reach of public transport to bridge the gap in areas typically underserved by public transport networks; and
- Support reductions in congestion, greenhouse gas emissions and air pollution by combining trips and using infrastructure more efficiently.

We have prepared this submission specifically for the UK market in response to the questions raised in the consultation. In doing so, our responses take into account the UK regulatory and legislative framework, as well as the likely deployment model in the UK. The responses contained in this document should not therefore be taken to represent Uber's view in other global markets.

## **II. Uber's response to the Law Commission's first consultation paper**

Our comment in response to this second consultation should be read in the context of [the comment](#) we provided earlier this year on the Commission's consultation relating to safety assurance and civil and criminal liability. In particular, we would highlight:

- Our agreement with the Commission that there is no 'one-size-fits-all' approach to regulating self-driving systems. Regulation may need to differ across use cases and levels of automation; in particular, different approaches may be needed where AVs are deployed in shared fleets for the purpose of providing Mobility as a Service as opposed to where they are privately owned. Uber particularly welcomes the Commission's proposal that AVs operated by a licensed operator are part of a fleet and would not be obliged to have a user-in-charge.
- Our recommendation that the Commission avoid making concrete decisions where evidence is not yet available to support them. Regulation should be able to adapt as

the technology it governs develops. Failure to maintain such flexibility may negatively impact the roll out of AVs in the UK and the government's aim of bringing fully-automated vehicles to the UK's roads by 2021, delaying the realisation of potential safety benefits from the technology and causing the UK to fall behind other developed economies.

### **III. Comments on Second Consultation Paper**

This Second Consultation Paper (the "Consultation") focuses on the particular issues arising through the deployment of Highly Automated Road Passenger Services ("HARPS") -- a service which "*uses highly automated vehicles to supply road journeys to passengers without a human driver or user-in-charge.*" Consultation § 1.4. In particular, the Consultation focuses on two overarching issues: (i) How to position the regulation of HARPS within the existing UK regulatory structure (the focus of Consultation Chapters 3 and 4) and (ii) as a substantive matter, how to help ensure that the deployment of HARPS will fulfill the policy promise of this new technology -- such as by reducing congestion, improving transportation access, and integrating appropriately with the public transportation system (the focus of Consultation Chapters 1, 6, 7, and 8).

At the outset, Uber readily acknowledges that the Consultation presents a very sophisticated appreciation of many of the important regulatory issues implicated by AVs, and the seminal role likely to be played by HARPS in connecting riders with AV technology. And, specifically, Uber wholly agrees that HARPS will play a particular role in making AVs available to the public -- with responsibilities that differ from those of a developer of AV technology, but that turn on the HARPS' specific function within the transportation system.

With respect to the two primary categories of issues identified by the Consultation, Uber's comments encourage the Law Commission to evaluate the approach to HARPS -- both procedural and substantive -- in the context of the broader regulation of vehicle transportation throughout the UK.

AVs undoubtedly offer exciting potential to improve a variety of aspects of the transportation ecosystem. That said, for the foreseeable future, AVs -- whether deployed through HARPs or otherwise -- will account for only a portion (and a relatively small portion, to begin with) of passenger rides throughout the UK.

This recognition gives rise to key insights for the core topics of this consultation.

On the question of which entity should regulate HARPS, the interconnectedness of transportation via HARPS and transportation via other service providers counsels in favor of an approach that does not require redundant (or contradictory) regulatory regimes for generally overlapping transportation options. For example, Uber envisions connecting riders to AVs through the Uber platform, utilising a very similar approach to the method Uber now uses to connect passengers with conventional vehicles operated by human drivers. As these products will mutually reinforce each other and will, from the public's perspective, appear deeply linked, Uber recommends that the regulatory approach for one should not wildly differ from that for the other.

Uber recommends that similar considerations inform the Commission's approach to pursuing the policy benefits of AVs and HARPS. The Commission has correctly identified a series of objectives such as congestion and accessibility that the deployment of HARPS may impact. But each of these policy considerations requires assessment against the backdrop of the transportation system as a whole. For example, attention to congestion is undoubtedly an important objective. But to be effective, a solution must focus across the types of various vehicles that actually contribute to congestion instead of (for example) focusing exclusively on AVs -- which will account for only a sliver of the actual congestion in a given area.

These and other comments on the Consultation will be explored in greater detail below.

#### **A. Appropriate Regulatory Structure for HARPS**

Chapters 2 and 3 of the Consultation largely focus on certain structural and procedural issues attendant to the regulation of HARPS, including on questions of what entity should serve as the primary regulator for HARPS and on what types of activities should fall within such a regulatory framework.

The Consultation recommends that a single national regulator provide a uniform approach to the regulation of HARPS. Certainly, such an approach would help to promote consistency for this type of regulatory structure, by avoiding a patchwork of rules that might otherwise arise. And this type of approach likewise reasonably addresses the inherently national issues implicated by HARPS: The imperative for safe, reliable transportation does not truthfully vary from locality to locality, nor should the standards that govern such safe operations.

All that said, we invite the Commission to consider the impact of its proposal in the context of the current structure for regulating existing Mobility as a Service platforms, like Uber. At present, a series of interlocking regulatory frameworks govern Mobility as a Service offerings throughout the country. Uber's approach to AV deployment would rely on a mix of conventionally-driven vehicles alongside AVs. Such an approach helps assure that AVs are available for those operational domains where an AV ride can proceed safely, with conventionally-driven vehicles available for those many areas where AV rides are not yet feasible.

The interlinked nature of these service offerings favors a very deliberate approach to the formulation of a nationwide regulatory approach to HARPS. Although likely a positive development standing alone, this type of approach could (counterintuitively) lead to additional redundancy or complexity if two types of analogous offerings on a single platform -- human-driven rides and AVs -- were subject to totally different regulatory entities, even though the actual services are seamlessly connected (both from a passenger and technological perspective).

#### **B. Appropriate Scope of HARPS Regulatory Regime**

Chapter 4 of the Consultation outlines certain proposed foundational principles for regulating HARPS. Uber is broadly supportive of the definition of HARPS presented

throughout the Consultation -- e.g., as an entity that carries passengers for hire or reward using highly automated vehicles on a road without the services of a human driver or user-in-charge -- and in aspects of the duties that the Consultation describes as potentially applying to HARPS.

Uber encourages the Commission to be mindful, in this process, of the potential divide between a HARPS entity, the developer of a given AV, and other service providers that may connect passengers with AVs without serving as the vehicle operator. In certain instances, the HARPS may provide passenger transportation utilising AV technology that the HARPS-entity has actually developed. But in other situations, an entity may offer transportation services utilising AV technology developed and perhaps owned, operated, and maintained by a some third-party.

As described in our previous Consultation response and above, Uber contemplates connecting passengers with both vehicles owned and developed by Uber as well as vehicles developed, owned, and operated by certain third-party partners. The HARPS structure should, in our view, focus on those duties held by *owners and operators* of AVs -- including the importance of proper maintenance and operating in accordance with developer/manufacture guidance. By contrast, the type of duties that the Consultation proposes for HARPS should not apply where an entity is simply facilitating AV transportation but is not *operating* the AVs -- such as by serving as a platform connecting riders and AVs; by offering certain routing functions; by assisting with customer support and engagement; etc. We recommend that the Commission expressly provide that such facilitating entities would not be covered by those regulatory duties that apply to HARPS.

For the regulatory structure governing HARPS, Uber agrees with a variety of aspects of the Commission's proposed approach, including that any framework for regulating HARPS should not regulate fares for HARPS (Consultation § 4.17) and that HARPS/AV-operators should bear the responsibility for ensuring AV roadworthiness (Consultation § 4.11) -- such as, for example, by assuring proper maintenance.

As the technology continues to develop and vary, though, Uber encourages the Commission to refrain from imposing regulatory requirements that assume a particular developmental path. For example, a legal duty to engage in remote vehicle operations (Consultation § 4.14) might be necessary for certain AV efforts which rely on that type of remote driving, but not for *bona fide* Level 4 AV technology which, by definition (see SAE J3016 at § 3.14 an Table 3) *do not* involve a human in the driving loop and instead rely wholly on the autonomous vehicle to execute the driving task and achieve any minimal risk condition.

Uber's own development efforts, for example, are aimed at designing vehicles which can achieve a safe state, such as stopping or pulling to the side of the road, in the event of a failure which renders the system incapable of completing the dynamic driving task. This approach helps avoid the risks that come with relying on a remote driver to fulfill such a function -- e.g., that limitations in communication infrastructure may impede a remote driver's ability to execute driving control.

Mindful, of course, of the importance of providing customer assurance, Uber is developing complementary features -- such as a Rider Assist customer support function -- which could (for example) provide advice to riders in the event of an emergency or provide additional inputs to the system to respond to real-time imperatives. But the availability of such supportive functionality (as a mechanism for promoting customer confidence) does not give rise to the need for a regulatory mandate to maintain the ability to remotely operate a vehicle. We would therefore strongly caution against imposing any categorical remote operator requirement.

We similarly encourage the Commission to appreciate the variability amongst AV development efforts as it fashions any type of HARPS reporting mandate, and to focus on data reporting that will promote a clear regulatory objective without imposing undue burdens on developers or operators.

For example, Uber supports reporting regimes which -- where consistent with the reporting requirements governing conventional vehicles -- require reporting of crashes above a clearly defined threshold for harm. Similarly, Uber appreciates the utility of reporting on total miles driven during autonomous operation (to help facilitate AV-related government planning efforts). We currently are participating in such a regime in connection with the testing of our self-driving system in Pittsburgh, Pennsylvania.

We would, however, strongly encourage the Commission not to impose a sweeping mandate to report data related to “untoward events.” Such a broad approach can result in highly variable approaches across developers and, moreover, can lead to perverse incentives by stiling AV operations in order to generate seemingly more favorable data.

### **C. Policy Objectives of HARPS Deployment**

Chapters 6, 7, and 8 of the Consultation focus on a variety of “wider transportation goals” (Consultation § 1.7) that HARPS may impact, with a specific discussion of the relationship between HARPS deployment and transportation accessibility, congestion, and integration with public transport options. All of these represent salient policy objectives, and areas where Uber has sought -- on a company-wide basis -- to offer positive and lasting impacts in the jurisdictions in which we operate.

Core to these efforts has been the appreciation that these various transportation goals depend on contributions from all actors within a transportation system; pursuit of these wider transportation goals is inconsistent with a regulatory approach keyed exclusively to AVs, to rideshare platforms, or to any other single type of transportation option.

For example, congestion results from the aggregation of all vehicles within a given area. Only a holistic approach to the problem of congestion can possibly lead to meaningful solutions. A policy prescription that exclusively regulates a given type of vehicle will leave the overwhelming majority of the policy problem untreated and would be ineffective, possibly perverse (by simply moving transportation usage from a highly- to lowly-regulated option), and would certainly be inequitable. In this respect, and as will be discussed more below, Uber would support certain across-the-board efforts to utilise congestion pricing to

ease congestion in a given area. But such pricing should impact *all* vehicles. An approach that focuses exclusively on HARPS would neither be effective (as the overwhelming majority of vehicles would remain unaffected) or equitable.

The same considerations should, in our view, inform the Commission's approach to other transportation-wide goals (the very name of this effort clearly conveys that these are issues that impact the transportation system as a whole). Uber recognises the imperative to improve transportation access for a variety of communities, with particular recognised needs for certain elderly members of the community, certain persons with disabilities, and those who live in areas without access to reliable transportation. AVs and HARPS can contribute to meaningful improvements in transportation access. But because AVs and HARPS plainly represent *part* of a solution, a regulatory framework should not look to solve transportation access via rules that exclusively impact AVs. Communities seeking improved transportation access benefit from improved accessible transportation options of all types, whether involving conventional vehicles, AVs, or otherwise. Any policy offering in this area should proceed accordingly.

Below we offer more specific comments on the Commission's description of various transportation-wide goals.

## **1. Improving Transportation Access**

Like the Commission, Uber recognises the potential of HARPS and AVs to contribute to more equitable, more accessible transportation over time, including through wheelchair-accessible vehicles (WAVs), as part of a broader set of product offerings.

Uber cares about making our network more accessible from the time a rider opens the Uber app to the time he or she arrives at the door; we acknowledge opportunities to improve and we are committed to continuing to develop solutions that support everyone's ability to easily move around their communities. Key here, is the need for access to the relevant product offerings -- to the Uber app and to transportation -- not necessarily access to AV rides in particular.

AVs may, in certain circumstances, present a useful and valuable option to individuals who might have difficulty driving themselves. At the same time, serving people with certain disabilities, particularly those who use electric wheelchairs and have ambulatory disabilities, with fully driverless vehicles will require significant product innovation to replace assistance currently provided by a human driver or operator, including, onboarding, offboarding, and securing restraints.

As a result, instead of focusing exclusively on AV accessibility, Uber has focused on accessibility across our current suite of products, including through "Uber Access," which connects riders via the Uber app to WAVs, and is helping to provide lessons on how best to provide and scale accessible transportation options -- lessons that will also assist in supporting self-driving vehicle fleet selection and product development.

Uber encourages the Commission to likewise focus on accessibility as a transportation-wide opportunity, and to calibrate any regulatory proposal accordingly.

Especially in light of the particular accessibility challenges attendant in AV development and deployment, expediting the drive toward improved access across the transportation system may require the government to focus on delivering transportation outcomes for the disability and elderly communities with *a mix* of human-driven and AVs, rather than focusing on AVs alone.

## 2. Congestion

Similar considerations inform Uber's approach to congestion and help recognise that this transportation-sector-wide challenge requires a solution that focuses on all vehicles and not simply AVs.

We strongly support the Commission's conclusion (Consultation § 7.21-7.22) that caps on the supply of HARPS vehicles would not represent an effective public policy solution to congestion and environmental concerns that can be better addressed through more sophisticated traffic management and road pricing.

Uber has supported broad-based road pricing regimes, including in London. As we have said, we believe that road and congestion pricing regimes will be far more successful in delivering on transportation system-level outcomes -- such as the reduction of congestion -- where they are designed to apply to all vehicles, rather than a certain subset of vehicles. Case studies from cities like London, Stockholm and Singapore demonstrate that *comprehensive* road pricing, applied across all vehicles (private motorists, delivery vehicles, taxis, and services like Uber) are effective methods in the management of roadway inefficiencies. And, moreover, such comprehensive road pricing efforts encourage more efficient and environmentally sound transportation choices, leverage new technology to reduce implementation burdens and costs, and can raise substantial revenue for governmental purposes.<sup>1</sup>

By contrast, the impact on congestion would typically be less effective where a regulatory approach targets only a particular type of transportation option. This is especially the case with a focus on HARPS and AVs given they present only a small sliver of the total vehicle mix in any given area. Imposing fees specifically and exclusively on HARPS and AVs would likely yield only a minimal impact on congestion, while sifting passenger demand away from HARPS and towards personal vehicle use. Such a solution would additionally conflict with the Commission's recognition about the adverse consequences of supply caps, and would inequitably foist the burden of addressing congestion-related issues exclusively on AVs and HARPs.

Instead, the Commission could meaningfully impact congestion and related environmental issues by encouraging shared rides -- whether through facilitating the deployment of AVs or conventional vehicles in shared fleets. Studies have demonstrated that the availability of such shared options can reduce the size of the total vehicle fleet, thereby reducing congestion and total parking requirements.<sup>2,3</sup> The Commission can encourage this

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<sup>1</sup> See Uber, "A Look At Congestion Pricing in Seattle," available at <https://medium.com/uber-under-the-hood/a-look-at-congestion-pricing-in-seattle-b6be48d6e803>.

<sup>2</sup> International Transport Forum, 2016, '[App-Based Ride and Taxi Services: Principles for Regulation](#).'



type of shared-ride approach through variable road pricing models and policies that encourage ride-sharing and carpooling.

### **3. Integration with Public Transport**

Lastly, Uber agrees with the commission about the potential for positive synergies between AVs/HARPS and public transport. We see extraordinary potential for self-driving technology to bring operational efficiencies to the public transport system, either directly through technology adoption or indirectly through complementarity with HARPS operations.

In this context, we believe that policies that encourage the utilisation of higher-occupancy AVs -- such as through providing AVs with a larger number of occupants with access to bus or other High-Occupancy Vehicle (HOV) lanes -- can encourage sharing and make Mobility as a Service offerings competitive with personal vehicle use. Such an approach, in turn, can allow for greater integration with existing public transport options.

In the conventional vehicle context, Uber has already been pursuing these types of integration opportunities, including through in-app journey planning and ticketing integration. These partnerships with transit systems can help transportation-disadvantaged workers get to their late night jobs, offer people with disabilities an on-demand, lower cost alternative to traditional paratransit services, and extend the reach of light rail in the suburbs. Furthermore, our Uber Transit tools allow Uber app users to see public transit options directly in Uber's app, allowing them to choose, and in some cases directly pay the fare for public transit for their journey needs. This feature, known as Uber Transit Journey Planning (which started in Paris, Mexico City, and the San Francisco Bay Area) gives Uber users the ability to plan door-to-door public transport journeys with step-by-step directions, complete with estimated fares and travel times provided in real time by a third party. All of these various partnerships leverage mobility as a service to extend the reach and efficacy of public transport system, and reaffirm that mobility as a service products can serve to complement a vibrant public transport system.

Given the role that mass transit will continue to play in the broader transportation system, these kinds of partnerships will be core to the success of Mobility as a Service as an alternative to personal vehicle use.

But successful integration requires deploying the appropriate regulatory tool to promote this type of positive integration. High-occupancy AVs (or conventional vehicles) may help promote the use of public buses. But such vehicles are not equivalent to public buses -- nor (in our view) should they be regulated as such.

For example, Uber is currently partnering with Toyota to develop a self-driving "e-Palette" vehicle which, among other things, could carry more than eight passengers when employed for passenger transport. The Consultation seems to suggest that such a vehicle might qualify as a "bus service" where operating on the Uber platform. But that approach

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<sup>3</sup> University of California, Davis & Institute for Transportation and Development Policy, 2017, '[Three Revolutions in Urban Transportation](#).'

would both discourage adoption and fail to recognise crucial differences between this type of service and a bus (including, most notably, the absence of a fixed route).

Accordingly, we encourage the Commission to explore opportunities to partner with HARPS to maximise the use of public transport, but not to treat HARPS, for regulatory purposes, as equivalent to a mass transit service.

#### **IV. Conclusion**

Uber appreciates the Commission's commitment to stakeholder engagement as it charts a carefully calibrated approach to the regulation of AV technology and deployment through HARPS. Uber has helped to lead recent innovations in mobility, and looks forward to further opportunities to partner with the UK government to explore additional possibilities for innovation -- whether involving AVs or otherwise.