IET Response to London Assembly consultation on Future Transport

1. How effectively does TfL plan for the possible large scale adoption of new technology?

It is our opinion that TfL does effectively plan for the possible large scale adoption of new technology however the difficulty here is that both the likely take-up and the impact is often difficult/impossible to predict and so planning for specific instances of adoption of new technology is also difficult.

The (draft) Mayor’s transport strategy does not directly mention specific new technology although several of the policies such as “planning of public spaces” and “improving Traffic Control systems” do imply that new development and new technology are welcome.

TfL have one of the most advanced traffic management systems of any city. They also participate in national and international projects for research and development purposes so at least some of the TfL staff have knowledge of new technology and potential implications.

TfL need to ensure that whatever new technology they adopt, it should be future proofed. Infrastructure developments need to attempt to be future proof for emerging technologies, particularly more autonomous systems. They need to be easily upgradable as new technology emerges. To enable this infrastructure technology should be easily accessible in the future.

Technology solutions must correspond with levels of risk and uncertainty posed by an unknown future. Therefore future transport necessitates the use of broad forms of capital, involving not only grants, loans and equity but also impact finance, blockchains and fintech that can reduce risk and address the needs of both present and future citizens.

TfL will need to manage the application of older regulations in order to meet newer business models through an approach which ensures new technologies do not fall foul of a regulation just because they are new.

2. Does TfL have the powers it needs to deliver fair and accessible transport services in a more technologically advanced future?

It is our view that TfL does not have all the power it needs. Some issues are specific to London and some powers are vested at national level (and arguably should be there, but it does mean that TfL has to wait for national policy and any national/international legal developments).

As examples of London issues:

TfL has requested more powers to regulate Private Hire Vehicles (and this would include autonomous vehicles used in this way). They also need more powers over pedicabs, for example. 

Other issues are matters for national governments or for international agreements. Areas where national legislation needs to be developed or adapted to support new technology include:

- Use of automated and driverless vehicles,
- Use of roads and public areas by types of vehicle, some of which are novel and use new technology (e.g. bicycles, electric bicycles, scooters, electric scooters),
- Licencing and helmet requirements for new types of active travel “vehicles” (segways, hover boards electric scooters).

TfL has a good understanding of its own network through technology deployment and analysis. However a significant amount of congestion is caused by travellers starting their journeys outside TfL’s domain, such as Home Counties etc. TfL could better deliver a response to predicted congestion.
by other authorities/agencies being mandated to open and share their data for the benefit of all London travellers (this could also apply to question 9 below).

3. What is the likely extent of the introduction of autonomous vehicles in London in the next ten years?

- Vehicles which increasingly support the driver can be foreseen,
- Vehicles with very limited autonomy (e.g. parking) are also likely,
- General purpose privately owned “driverless” passenger vehicles are unlikely to be available, so we don’t believe general purpose driverless taxis will be available in 10 years,
- However, fleets of autonomous vehicles of the pods/shuttle type operating in limited domains (fixed routes, slow speed, pedestrianised areas) will be seen in some locations e.g. business parks, universities, tourist destinations.

It is currently unclear whether automation would mean more or less congestion on the roads. This and other unintended consequences should be considered by TfL, as outlined in this IET insight: http://www.theiet.org/sectors/transport/topics/autonomous-vehicles/articles/expect-the-unexpected.cfm

While autonomous vehicles are some way off, TfL should maximise short-term use of data from connected but human driven vehicles for asset management, traffic monitoring and better signal control, smart parking and emissions monitoring, either via OEM (Original Equipment Manufacturer) line fit, after market dongles or simply by using smartphone apps.

TfL will need to provide increased infrastructure to support all autonomous systems, in particular the potentially higher demand on communications etc. to supported connected vehicles, this could also raise the issue of cyber security.

We have noted that there is no mention is made of the Maritime segment in this consultation. Use of the waterways for autonomous passenger/delivery vehicles should be further investigated.

4. Will TfL consider introducing autonomous buses?

We expect that they will keep this under review and consider introduction when the technology is well-proven, economically viable and acceptable to the public.

The inability to recruit bus drivers in Singapore is a significant reason for the development of driverless buses. Similar labour constraints in London (or labour costs become higher to make public transport less viable) and therefore require TfL to accelerate London’s need for automated buses.

Whilst we don’t foresee autonomous buses being widespread in 10 years, technology will support bus operations in a number of ways:

- More sophisticated energy and power management of electric and hydrogen buses,
- Driver support e.g. Intelligent Speed Assistance and limited steering support,
- Real-time scheduling software and intelligent incident management,
- Vehicle to Infrastructure (V2I) communications for buses to report traffic conditions and for traffic control to (even) more intelligently respond to bus movements,
- Very limited introduction of pods and shuttles on specific limited routes as a new form of public transport.
Market research has shown that passengers would like to see some form of helper on the bus to help elderly and mobility impaired on and off. This should be considered for London.

5. Do drones and droids have significant potential to reduce the level of delivery traffic on the roads?

As far as drones and Unmanned Air Systems (UAS) are concerned, they certainly have the potential for the delivery of large loads with existing UAS capable of delivering several tonnes. However, these are unlikely to provide a cost effective alternative to road delivery (for larger freight) except for a very small proportion of deliveries where speed justifies the far more substantial cost of drone delivery. On the other hand, rapid ‘courier’ delivery traffic for small packages of high importance by Small Unmanned Air Systems (SUAS - weighing less than 20kg) is likely to ramp up far more rapidly. But even this relatively low risk activity cannot happen until a safe control system is in place. As far as we are aware, thinking on how such control systems might be established and operated is not advanced and, therefore, we cannot see even SUAS coming under effective airspace control over or close to urban areas for at least 5 years. Even though SUAS will have very limited practical use (in a 10 year horizon), technology development and practical trials should be encouraged.

6. What are the specific safety hazards arising from the widespread use of pavement-based droids?

Common sense would indicate that potential collisions with pedestrians, cyclists and vehicles on the roads would create very real hazards requiring droids to have very safe, reliable guidance and collision avoidance systems fitted before being deployed. Given the busy pavements in many areas of London, the use of droids during the day may not be realistic. However, their careful use for specialist purposes at night (i.e. security/policing, survey for repairs, litter collection etc.) would seem a likely possibility. Droids maybe the subject of vandalism and measures to reduce the impact and likelihood of this happening should be investigated. Again practical trials should be supported.

7. How will access to airspace for drones be managed, if at all, and by whom?

Airspace utilised by drones and UAS will need to be controlled to avoid collisions that would generate a serious hazard to personnel, buildings and ground vehicles; how this should be done is really a question for the CAA and NATS. The principles of current air traffic management systems will need to be adapted and scaled down to urban level with (automatically) controlled routeing and scheduling to avoid collisions between UAS and between UAS and manned air or road traffic. Greater London and other urban areas will need their own lower airspace management systems, integrated with existing controlled airspace, road and rail systems, buildings and adjoining ‘lower airspace’ zones for drone/UAS use. These urban lower airspace zones will be best managed by or for the appropriate city councils, possibly with initial skills transfer/training from NATS. The cost of the required infrastructure will be high and is likely to slow the development and extent of deployment of such systems. As UAS users emerge, they could be charged via a licensing system to raise funds for the establishment and upkeep of the necessary control organisation, equipment and infrastructure. Critical users should be prioritised through the licensing process (e.g. traffic monitoring, infrastructure inspection, urgent medical deliveries).

8. What regulation is needed to ensure drones and droids are used safely?

For safety and control, drones and droids will need to be certified and licensed to meet regulatory requirements. For the air systems, this is CAA territory for UAS up to 150kg. For larger UAS,
certification is currently carried out by the European Aviation Safety Agency (EASA). Certification, whether it be by the CAA, EASA or a different organisation, will need to address intrinsic vehicle safety, safety of control (including automatic collision avoidance systems), safety of operating and maintenance arrangements, the competence of operators and maintenance personnel and environmental impact. Levels of regulation for certification and licensing should be chosen on a risk basis. Regulation should be managed in a way which allows for cross-learning between the regulators.

Management of the drone flight planning and authorisation is something that the likes of Altitude Angel could offer services into the emerging market need for safe operation in uncontrolled airspace. But until then, the Drone Code http://dronesafe.uk/drone-code/ is a guideline for staying on the right side of the law as drone operator (i.e. piloting a craft remotely, not a fully autonomous vehicle). We do need to recognise that in certain sensitive areas in central London, restricted airspace zones exist requiring application for a Non Standard Flight http://www.nats.aero/nsf/ with NATS.

9. What are the next steps in developing app-based transport technologies?

App development and the services that they support or promote is a dynamic area and one where TfL should support market development rather than try to regulate or dictate development. However, a code of practice of some form to explain their expectations might be helpful. To support, TfL should continue their existing policy of making as much data as possible freely available to stimulate the market. They should also require suppliers and encourage partners to do the same. It would be helpful if TfL could stimulate a wider data pool (i.e. all Local Authorities) so that app developers could access a wider market and therefore create a bigger community to provide enhanced apps and analytics.

10. How should TfL and the Mayor manage dockless cycle hire schemes?

Dockless cycle hire schemes are a potential solution to the situation of docking stations being full. In most reported implementations of dockless bike hire schemes the discarding of bikes in random places has become a hazard and expensive to clean up. In some Chinese cities, it is reported that there are mountains of discarded dockless bikes – essentially left to rust. Thought needs to be given to provision of specific spaces. This is problematic in a crowded city and such spaces may also be appropriated for other purposes unless their use is carefully managed and abuses enforced.

Currently there is no requirement for a scheme to have a permit and the form of enforcement is not yet decided. A code of practice has recently been launched (September 2017) so how this performs should be monitored before any further legislation is introduced. Any future regime should apply across London (and preferably across the UK).

It is not (yet) clear how well the dockless scheme is working in London. Nevertheless, there are a number of such schemes in other cities and around the world (e.g. Manchester, Oxford, Singapore) so close study of their operation and benefits/drawbacks would seem worthwhile such that best practice can be imported to London.