Automated cars, driverless cars, automated cars – whatever you call them (and yes, it does make a difference) they are the hot topic in transport today. Carmakers are investing millions of pounds in research & development, mock towns are being built to test automation concepts, fact-finding hearings are taking place, laws are being passed – even international treaties are being re-opened.

This is the subject of a new Occasional Paper that John Polak and I have completed for the Independent Transport Commission, Britain’s leading pan-transport research charity (www.theitc.org.uk). Entitled Automated cars: A smooth ride ahead? we survey what is happening now, what is at stake, the direction of travel, and which policy options are on the table.

The setting-off point must be the great uncertainty about the future course of events; we are firmly enveloped in a dense fog of proprietary technological advancement, bold statements about future intentions that may or may not come to pass, regulatory uncertainty, and unrealistic public expectations. Even leading experts fundamentally disagree about what comes next. Last month’s Transportation Research Board conference saw Alain Kornhauser (Princeton University) and John Capp (General Motors), both well-respected intellectuals, square off on the relative merits of ‘connected’ versus ‘autonomous’ automation, with Kornhauser pointing out the complexities of implementing standards in such a fast-moving sphere. Their exchange was followed by the highly-regarded James Misener (Independent consultant) and Steve Shladover (University of California) debating whether a fully-automated car will be for sale in 5-10 years or not for a generation. The take-home message: if the high priests of Vehicle Automation disagree on the big questions, what are the rest of us to make of it?

Automation is not new (consider intermittent windscreen wipers), but the degree of automation that can be delivered today is a qualitative leap over earlier generations of in-car technology. Take bog-standard cruise control, add the sensing and processing capability to react to the vehicle you’re following, and throw in lane-keeping assist. Voila – you’ve got a car that can control itself, both its steering and its speed, albeit in strictly controlled motorway conditions and for limited periods of time. In fact, you’ve got a system that is available commercially on a 2014 model year Mercedes S-class.

So is it full speed ahead, then? I confess sympathy with the more conservative roll-out scenarios – I struggle to see how a car capable of fully-automated driving at [nearly] all times and [nearly] all places can be delivered commercially in the next few years. For some time automated-driving technology will be some-times/some-places – and there is a yawning gap to cover before a car that can deliver sustained all-times/all-places automation.

Big-picture, overarching policy issues arise. Will we need new driver-licencing requirements? Just how distracted can we allow ‘drivers’ to be, under what circumstances, and how do we ensure they take over control when required? Will public transport thrive in driverless mode or be out-
competed? Will we tolerate longer commutes, if we can pass the time at our leisure rather than driving? Are dedicated motorway lanes required? How robust is the current transport investment programme to technological change? What updates are required of techniques for appraising transport schemes? What are the consequences of the decades-long transition period with mixed human/machine traffic streams? Will traffic levels, fuel consumption and emissions go up or down? What happens to the motor insurance industry if, as is widely expected, there are fewer crashes and hence less risk to be insured? And there will inevitably be crashes – new types of crashes – how safe is safe enough, who is at fault when something goes wrong, and are there limits to liability? Will that be simply a question for the courts to sort out, or will Parliament pass legislation to provide guidance? Hackers will be salivating at the notion of controlling other people’s cars through malicious code. More positively – how can UK plc’s strengths in automotive technology be leveraged for maximum economic benefit? The UK also provides an inviting legal environment for testing automation, with both an established administrative infrastructure for testing new vehicular technology and a relatively flexible set of legislation governing activity on roads.

In addition to ongoing work to develop testbeds for vehicle-automation in the UK, the Department for Transport recently launched two major efforts of direct relevance. The first aims to improve the Department’s ability to account for uncertainty when making future-year traffic forecasts. Here it will be necessary to address both statistical uncertainty and, crucially, technological uncertainty as well. The second major initiative is the legislative and regulatory review announced in December’s National Infrastructure Plan, slated to report by the end of 2014.

Clearly the Government is right to be tackling the challenges of vehicle-automation now; whilst the private sector is better-placed to deliver the required technological advancements it can do so most effectively in a flexible and up-to-date regulatory environment.

Automated cars will bring far-reaching changes to the way the transport network operates, and our ITC paper aims to provide a brief introduction to the relevant issues. We conclude our new paper with the suggestion that slow and deliberate forward progress is preferable to the risk of a major setback: the circumstance to be avoided at all costs is a major incident that discredits vehicle-automation and sets the agenda back many years.

Dr Le Vine is a research associate at Imperial College London’s Centre for Transport Studies. He serves on the US National Academy of Sciences’ standing committee on Road Vehicle Automation. The Occasional Paper ‘Automated cars: A smooth ride ahead?’ can be accessed free-of-charge from the ITC’s website: www.theitc.org.uk. Feedback via slevine@imperial.ac.uk or @scottericlevine (twitter) is very welcome.