

**Planning Committee****14 October 2014****Agenda Item 5: London Infrastructure Plan 2050 - Consultation**

**Nicky Gavron AM (Chair):** If I could just very briefly introduce this. We are looking at the Mayor's Infrastructure Plan. I do not know how many of you have looked at it or its supplementary documents, but it has been in progress for over a year now. It is a gargantuan task and I want to congratulate Jeremy [Skinner], who is here representing the Mayor and is leading on this. I know it is a work in progress but a huge amount of work has progressed in the last year. Congratulations on that.

It is looking at the future directions for London until 2050, the next 35 years, and it obviously has to be able to respond to the challenges and the opportunities as they come along. It has to, in a sense, be flexible as a plan. It also must not lock us in by decisions made now, which in the future will actually turn out to have been the wrong decisions. It needs a lot of thought about how it is carried out. It obviously needs the Mayor to have the right kind of authority and leadership and the ability to plan strategically and to prioritise and, of course, to raise investment. We are not considering all of that today. We could not possibly. However, we are the Planning Committee and we are pulling together the response to the consultation document on the Mayor's Infrastructure Plan from all the other committees. Today we are going to drill down or focus on particular issues which have not been considered by other committees.

I would like our guests, when they are looking at what we are going to talk about today, to think about four cross-cutting themes when they are answering questions. One is financing, because we are not going to have a separate session on financing. Just think about financial models, business models and procurement as you go through. Another is phasing, short, medium and long term. Then there is the balance, really, between what should be centralised and what should be decentralised, what should be local and what should be done strategically. It is quite an important question. How should they complement each other? You can think about those as you go through.

There is one more thing, which I have already mentioned, in a way, which is lock-in and making sure that we do not lock ourselves in. For instance, surely we are looking at a low-carbon, resource-effective economy and we do not want to lock ourselves into high-carbon, resource-inefficient solutions which would then be there for 25, 30 or 40 years, or maybe much longer. We have to think about that.

I am now going to ask our guests to introduce themselves. Andrew Adonis will be here shortly and he will introduce himself. If I can just ask you to introduce yourselves, starting with Jerome, and say a little bit about how your role is relevant?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I am Jerome Frost. I lead a division of a company called Arup that works internationally. I am a planner by training. The division that I look after looks after all of our business areas including many of the topics today – energy, water, transportation – but most importantly, we also look at urban growth and master planning on a city scale as well as a local scale.

I also, before I joined Arup three years ago, was Head of Design and Regeneration for the Olympic Delivery Authority (ODA). I worked there for five years overseeing the planning and the delivery of the new facilities and the new infrastructure needed for London's Olympics in 2012.

**Michael Henderson (Associate Director – Sustainability, AECOM):** Hi. I am Mike Henderson. I am Associate Director at AECOM, another large multi-disciplinary engineering and planning firm.

**Nicky Gavron AM (Chair):** You are collaborating?

**Michael Henderson (Associate Director – Sustainability, AECOM):** We collaborate a lot.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** All the time.

**Michael Henderson (Associate Director – Sustainability, AECOM):** The Olympics were a point in case. For the last few years, I have been working mainly looking at the interaction between green space and water management. That has taken me down a route of the cost benefits of the interaction between spatial planning, water management and green infrastructure. Here today, I am trying to bridge those two gaps in the Infrastructure Plan.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** I am Dr Dominic Hogg. I am the Chair of a consulting firm called Eunomia Research & Consulting. This is a company which I set up in 2001. It is a company of around 50 people. We do work in waste management, low-carbon energy and also ecosystem services. For the best part of the last 20 years I have worked in waste policy and strategy and, amongst other things, recently we have been reviewing the targets in many of the key European waste directives on behalf of the European Commission (EC) and the Directorate-General for the Environment there. I am here mainly to talk about the work we do on waste and matters related to waste management. That having been said, I also wear another hat in the west of England. The company I work for is based in Bristol and I am Chair of our Local Nature Partnership. We are looking very seriously in Bristol - which is the European Green Capital next year - at how we can improve the provision of green infrastructure.

**Nicky Gavron AM (Chair):** Thank you. As I said, Andrew Adonis will introduce himself when he arrives. We are dividing the way we are tackling this into four sections. The first is about what infrastructure is in the Infrastructure Plan, and what is missing. As I have said, other committees are considering the Infrastructure Plan. For instance, this morning the transport section was considered by the Transport Committee and we will be looking at transport only in a supporting way to spatial planning. We are going to actually look very carefully in this section at energy, water and waste. We are also going to look at what infrastructure is missing from the Infrastructure Plan. Although it is very comprehensive, there is still some missing. That is section one. In section two, we are going to look at where development should go and what the priorities for development should be. In section three, we are going to look at how land can be unlocked for development and where that land might be. In the last section we are going to look at deliverability. I will just let Andrew quickly introduce himself.

**Lord Adonis (Labour Peer):** Andrew Adonis, former Transport Secretary.

**Nicky Gavron AM (Chair):** You are leading the ... say a little bit more for our audience.

**Lord Adonis (Labour Peer):** I am also a former Education Minister and I have been leading an independent growth review on policy.

**Nicky Gavron AM (Chair):** All right. Do you have a microphone on there? It is quite quiet. OK. We are going to start first with questions about energy and water. I know there is a connection between the two, but maybe we might focus first on energy. I then want to go on and look at waste.

The first thing I want you to address, really, is quite a broad question. Is the Infrastructure Plan really assessing the needs in the right way and is it correct in its assessment of the level of energy that we need? Also, are the measures that are proposed for delivering that sustainable? We are, of course, taking as read that they need to be competitive, too. I do not know who would like to kick off. Perhaps Jerome would.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** OK. Thank you. In terms of the assessment methodology, I certainly do not see any particular issue with that. The issue that we really need to get to the nub of is the balance between the way in which that additional energy is provided, and the way in which we balance our current energy needs with the future and deliver additional capacity over time. The real balance that needs to be struck is the degree to which we rely on nationally provided energy through National Grid systems, generation from long distance and local generation and the degree to which that total adds up to energy needs on a day-to-day basis, and the degree to which it balances out peak needs with troughs in demand.

There has been a lot of work in London, more or less since the 2008 London Plan, which really did advocate local generation of energy and the implementation of many of those systems we have seen taking place across London in many different ways. There are a number of other projects at the moment currently investigating the feasibility of extracting heat and energy from various different existing assets, as well as building new.

Probably the most relevant experience I have is of the provision of two energy centres on the Olympic Park and their effectiveness. The heart of the discussion that we had on the Olympics was, again, the degree to which we could rely on National Grid energy provision. Plus the degree to which we then needed to either top that up or provide additional constant capacity locally. You cannot consider energy, I believe, as distinct from heat because the more heat that you can also generate locally and distribute locally, the less energy demand that is placed on top of that. The system that we devised on the Olympic Park was one which was based on topping up at peak demand, providing resilience to local demand networks. When the Olympics was at its peak, we were not completely reliant on the National Grid and we could draw upon local energy provided in the two energy centres, but the rest of the time we could draw upon the grid quite reliably. We also used the energy centre as a backup system in the event the reliance on National Grid failed.

We designed into the local energy system the capacity to grow quite extensively. The system designed in the Olympic Park is designed to grow and to deliver energy to up to around 12,000 new homes. The likelihood is that that demand will never be met, but it does then give us additional capacity to extend the network into neighbourhoods adjacent to the Olympic Park. To promote development and to provide servicing of sites in some of the regeneration areas that sit outside the Olympic Park. Indeed, that foresight planned into the Olympics back in around about 2006 is now being realised. The legacy company is extending that network in collaboration with Cofely [GDF Suez company in the UK service business], the provider, into Hackney Wick and into Fish Island, adjacent areas to the energy centre.

**Nicky Gavron AM (Chair):** Can you just pause for a minute on that? That is really interesting. Can you see that happening on other sites? It would help with lock-in, would it not? It would help with unlocking sites because there are a number of sites that need unlocking and it might be too expensive to do it if you have not already fitted the energy infrastructure.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Absolutely. I would argue that the flexibility and the resilience built into the local energy network has released or given greater flexibility and has improved, frankly, the viability of adjacent sites. As there is a certainty that developers can draw upon around a resilient energy supply and, more importantly, a resilient heat supply that is provided locally. It was quite a hard slog to convince the energy suppliers and operators that this was a viable thing to invest in. Indeed, the ODA had to invest quite considerably to part-fund the network in order to future-proof it in that way.

To a degree, we probably did not future-proof it as much as we should have done at the time. We did not build pipe networks, for example, for the heat distribution into bridges and into Hackney Wick and adjacent areas at the time, because it was considered to be very high-cost with no guarantee they would ever be used. Actually, today that work is now being done, probably slightly more expensively perhaps than it might have been done if it had been planned in the first place. However the capacity and the flexibility is there in the system for the energy network and the heat network to be extended, very cheaply and very quickly into neighbouring sites nonetheless, because the really expensive kit sits within the generation equipment in the two energy plants.

**Nicky Gavron AM (Chair):** It is such a fundamental point you have just made that I just want to ask Jeremy. How far have you built that thinking into the Infrastructure Plan?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** It is absolutely pivotal to the success of the plan. I would preface my remarks by saying that we are in the middle, as you say, and a lot of work has been done, but it is clearly contingent on many other parties delivering. We are not responsible for the delivery of most of the infrastructure in the city.

To address the specific question directly, one of the critical barriers that we see, particularly in the electricity distribution network, is the regulatory hurdles to investment ahead of demand. Whereas we are prepared to take very substantial bets on London's long-term growth in transport and we use public sector funding on Crossrail 1, potentially on Crossrail 2 and on various other very large schemes that take decades to gestate and eventually appear, we are still waiting for Crossrail. It was the first job I took on when I joined the Greater London Authority (GLA) nine years ago to campaign for Crossrail and it is still three years away from actually opening for business which shows you how long these things take, and transport projects take even longer.

However, in electricity, because of the era in which the industry was privatised and regulated, an era when London was declining and when there were inefficiencies in the way that the network was managed, we are now in a completely different situation where London is growing. The concept of London exceeding 11 million by mid-century was not, I believe, in the foremost of policymakers' minds when they were planning this system in the mid-1980s, when London's population had been shrinking for the previous years, so yes. We allude to a lot of detailed work going on at the moment with Number 10 [the Prime Minister's Office], UK Power Networks, the Office of Gas and Electricity Markets (Ofgem) and others to try to reform the regulations to enable there to be investment ahead of demand.

**Nicky Gavron AM (Chair):** Let us just log that. There is a barrier because you can plan ahead in terms of transport – though you still have to raise the money – but there are regulatory barriers to planning ahead, let alone raising the money, yes?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Correct.

**Nicky Gavron AM (Chair):** Correct, OK. Jerome, I interrupted you – sorry – in your flow.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** That point is key. We see a number of different responses to it. The ODA was in a rather unique position because it was able to plan in the flexibility on the basis of providing resilience for the Olympics and in doing so, therefore was able to justify more public spending to build that flexibility and that future-proofing into the system.

There are other examples that are successes or are building up to be successes, if you like, where the public sector has played a role whereby it can give the private sector greater certainty on the future returns. In other

words, it can share some of the risk. A good example might be the South Kilburn Estate where a local energy network is being supported by Brent Council and an energy services company (ESCo) set up to deliver that. Again, the role that Brent is playing in that is sharing risk with the private sector and therefore delivering a system which relies on future returns upfront and ahead of development, in order to provide the best deal for both the developers involved and also the occupiers of the 2,400 or so homes that are going to be built.

We see that kind of approach actually becoming more consistently applied across London and quite rightly so, because it is the means by which you can apply and deal with some of the issues when you are dealing with an existing piece of city, undergoing quite considerable change and growth, where the delivery of large-scale National Grid-based energy increases to deal with that increased development demand might take a long, long time and might well be caught up, as was pointed out, in these regulatory disincentives from coming ahead of development. If the public sector can play that local role in facilitating and taking on some of the risk, it can deal with that peak demand that is generated by the increased development and provide greater certainty.

**Nicky Gavron AM (Chair):** Can I just ask you what is happening, then, at Vauxhall Nine Elms Battersea, which is on the way? Are the lessons from the Olympics being learned there?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I do not know that one in detail, I have to say. I do believe they are looking at a local energy network. Whether they are building in future capacity beyond the capacity of what is currently being developed and the role of the local authority, I cannot answer, I am afraid.

I can tell you about the work that we are doing at the moment in Croydon for the local authority there, where we are looking at planning for 167 new development sites, between 7,000 and 9,000 new homes and about 1 million square feet of new commercial. The issue there is that when you get to the build-out of that peak development, you are placing real demands, particularly midwinter, on the existing grid supply locally. If you were to rely on grid upgrades, it would be, firstly, expensive and could not be guaranteed ahead of that development. It is most likely to respond to the demand as and when it occurs and therefore may be too late to give developers certainty of supply and resilience. The local authorities are playing a role there, with the support of local private developers, in developing a system which it can support and take some of the risk out of that. Where local energy provision and local heat provision effectively deals with that topping-up beyond what the grid can guarantee, in order to give developers confidence and certainty in that circumstance.

**Nicky Gavron AM (Chair):** Quite apart from the sharing of risk, could this be local ownership, too, of these grids?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Again, one of the issues, particularly when you are dealing with that kind of scale, is just how far ahead the private sector has to look in order to secure its returns. It is very difficult to engage the private sector in what is generally quite a large upfront cost when the return in terms of the building out of thousands and thousands of units could be 10, 20 or 30 years over that kind of scale, with no guarantee that those occupiers will draw upon entirely that supplier's electricity or heat. In that case, it is far more resilient for the public sector to think about whether it can take on the role of providing that and effectively take on the role of supplier of that energy. As it has more confidence in that development programme being built out perhaps faster or perhaps more definitely than the private sector could have, because it has control over planning and it has more control over steering developers towards connections with the local energy network, perhaps, than the private sector might realise.

**Nicky Gavron AM (Chair):** Is there not another hit, too, that it might be more resilient than --

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** It certainly --

**Nicky Gavron AM (Chair):** You remember the case of Woking where the lights went out in great chunks of south east England but they stayed on in Woking because it had lots of decentralised energy systems.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** It certainly can be more resilient. Of course, there is also the alternative risk that the local system fails but it is more resilient because you effectively have two systems to fall back on, absolutely. It is more resilient regardless of whether the private or the public sector owns the system, I would say. The ownership of the system by the public sector in the first degree is all about confidence, in my view. It is about bringing confidence to a particular area in which we are trying to encourage the private sector to invest and perhaps it needs persuasion, if you like, in order to take that first step of investment that the public sector investment in such a system can bring.

**Nicky Gavron AM (Chair):** That is good. Thank you. I do not know if other people want to say anything about energy at this stage. I am sure it is going to come back again when we talk about land and spatial opportunity areas and so on. I just wondered if anyone wants to say any more. Otherwise, we will move on and just look at water.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** May I make one more comment?

**Nicky Gavron AM (Chair):** Of course. Any of you are welcome to make a point.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** The other part of this is looking at how you reduce energy demand and I do not just mean household or business demand because, obviously, if you can build in a reduced demand profile, you can make better use of your existing systems or the systems you are planning for.

One of the things we could consider perhaps more strongly in the plan, as it sits at the moment, is the layering of function on some of the infrastructure that we are talking about. If we look abroad, for example, and we look to the Netherlands, they are currently designing roads in the Netherlands with a pipe system within the tarmac which draws heat from the ground beneath the tarmac. That has two purposes. One, it melts the snow in winter, which means they do not need trucks going up and down. Two, it also supplies a consistent heat source to local buildings when it is not being used to melt snow, which is only three or four times a year.

Arup is actually involved in designing railway tunnels at the moment in Austria which use a similar system where you have pipes embedded in the walls of the tunnel. They draw heat from the neighbouring soil and that heat is piped into local buildings. When the cool air comes back out of that building, it comes back into the tunnel walls and cools the railway tunnel to keep the tunnel cool and to reduce costs for the railway operators at the same time.

That kind of applied, layered thinking impacts on the way in which we reduce demand, because the heat provided to those buildings obviously then reduces the demand on electricity or heat networks that might be providing heat from another source. It also then reduces the maintenance costs and management costs of other infrastructure, which might be the core piece of infrastructure we are considering at the time, ie the tunnel or the road.

**Nicky Gavron AM (Chair):** Interesting. This is a huge topic, but I have to say that some of the detail of this was considered by the Environment Committee, which is why I am trying to keep it to the way you are doing it, at a strategic level, which is very helpful. Does anyone else want to come in on energy before we move on to water? We can come back to energy later on in the discussion.

**Lord Adonis (Labour Peer):** Can I make a strategic comment: I think this is going to run through a lot of our discussion this afternoon. It seems to me the big issue we are going to face is how we get from the draft plan in front of us, to something which the delivery board can actually deliver. The big missing link, as has already come through in what Jeremy [Skinner] has said, is that in this particular case you have a big private sector element. However in all cases you have a big Government element to agree what is going to be in the plan, not least the relationship between the Government and the regulators, whose agreement is going to be absolutely crucial to taking any of this forward.

The bit that needs further work is understanding what this middle stage is going to be between the consultation on the plan itself and, then, actually having something which can be delivered by the delivery board. The thinking at the moment – that it is simply going to be enough to generate consensus on more projects – given the radical nature of so much that is in the Infrastructure Plan, is probably too optimistic. What is going to be needed is some proper intermediate stage of assessment and negotiation with central Government on the agreed plan, which then goes to the infrastructure delivery board. Understanding how that central stage of work is going to take place is going to be quite important.

**Nicky Gavron AM (Chair):** Maybe you would return to that in the final section when we are looking at deliverability, Andrew, and explore that in a bit more detail with us. That would be good. Do you want to come in?

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Yes, just one comment, I suppose. In the actual plan and in the revisions that are proposed at the moment, there is a lot of emphasis on the potential role of waste and the provision of energy. I always get a little concerned when I see that type of emphasis, because all the work we have done – including work with the Committee on Climate Change, D-G Environment and so forth and using the Government's own projections for the way in which the energy system will become decarbonised – suggests that if we do remain generating a lot of energy in 2050, we will almost undoubtedly be doing so through the most carbon-intensive form of generation that is present at the time, unless there is really considerable change in the nature of what it is that goes into those facilities.

There is a bit of a disjuncture, I have felt, between what is in the current plan and looking out to 2050. You seem to be modelling waste infrastructure in terms of what it does for energy and very much in terms of what we think about it today, rather than what it might be conceived as doing in 2050. That future vision in terms of the role of waste vis-à-vis the provision of energy could really do with some further unpicking.

**Nicky Gavron AM (Chair):** That is very interesting, actually, because we have just been through the Examination in Public of the London Plan and I noticed that the waste risings – municipal waste, for instance – even with the rise in population are not projected to rise very much. The incineration capacity we have already, not all of it is of course energy from waste. Even at Beddington [energy recovery facility in Sutton], it is interesting what you were saying, Jerome [Frost] because there is not the future-proofing there yet. The pipes which would create the heat from the very inefficient electricity that does not become more efficient until you take the heat off as well, have to go to a development ten miles away and the money is not there and they are not being made. Of course, Edmonton and Belvedere [waste incinerators] do not have heat taken off them. Do we want 1.8 million tons of incineration capacity? It is at least 50% and the Mayor is going to bring forward the recycling targets. It does not add up. I am interested that you have made that point because it actually does not add up.

Perhaps you are going to talk about maybe later the secondary materials economy or what is called the circular economy and perhaps we can come back to it then. Jeremy, do you have any comments on that?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Not on that particular point.

**Nicky Gavron AM (Chair):** OK.

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** On energy, the only other thing which we do talk about in the plan is access to the market for new entrants and new players. We think that could be made easier and we think that is important.

**Nicky Gavron AM (Chair):** Yes, OK. Mike, do you want to kick off on water?

**Michael Henderson (Associate Director – Sustainability, AECOM):** Sure. There are a lot of parallels with water and what Jeremy [Skinner] has just been saying in terms of lead-in times and issues around the regulator and things like that.

However, before I get into the wider issue around water, your question is really whether the scope of demand is assessed in an appropriate way. Firstly, it is really great that we are seeing a long-term vision for infrastructure delivery. That is quite ground-breaking in itself and it is something that we are really keen on exploring further. However, it needs to be aligned with a long-term spatial planning vision. In some of that testing of demand, there are variances between a number of different elements.

Taking a sub-regional view and looking beyond London, a lot of London's resources come from beyond London, particularly water. A lot of people move in and out of London and there is a very tangible link between the ways in which London is going to support growth with its surrounding settlements. There has to be that bigger thinking. Scaling it down as well, there is a difference between the centre of London - or the centres of London - and the way infrastructure is delivered around the outside. Then there are probably a number of different scenarios that could sensitivity test a lot of the work that has been done on the way in which infrastructure might be delivered. There is a lot more variance in water than perhaps in some of the other sectors.

**Nicky Gavron AM (Chair):** The thinking is less developed in water, is it not, or rather implementation is less developed?

**Michael Henderson (Associate Director – Sustainability, AECOM):** I think so. If I am honest, there has been quite a polarised debate recently with the Thames Tideway versus everything else. It is time to bring it down to more of a sensible, long-term discussion. This is an opportunity through which we can do that and say, "All right, we can park that issue and take that as something which is being considered now and think about what the long-term 2050 plan is". That is a way of getting away from that debate and starting the next phase of discussions.

It is worth saying a few things about water and what water is, really, before going too deeply. Energy is not simple, but it is not just heat and electricity. It is quite complicated. The infrastructure planning continues around the historic legacy of water supply. How do we get clean water to us? How do we get rid of waste water and, within that, storm water or surface water? Finally, there is the flood risk. These are often managed in their silos and one of the biggest challenges is how we look at water as a whole water cycle and really understand water cycle management within an urban context.

On the supply side, it is noted in the plan that we are going to be deficient by 10% by halfway through the plan. We do not have enough water to supply projected development.



**Nicky Gavron AM (Chair):** Mike, deficient in what per capita litre amount are we talking about? We are very, very wasteful at the moment.

**Michael Henderson (Associate Director – Sustainability, AECOM):** We are. The average in London at the moment is between 150 and 160 litres per person per day.

**Nicky Gavron AM (Chair):** Yes. That is about 50 litres more than many other cities.

**Michael Henderson (Associate Director – Sustainability, AECOM):** Yes, and new development, if it is meeting the Code for Sustainable Homes, purports to be 105 litres per person per day. However, it is clear that through fixtures and fittings which generally deliver that saving, there is a lot of risk because those fixtures and fittings can be taken out. The reports of actual studies that have been done post-development suggest that actually they are not delivering anywhere near that and they are more like 120 litres per person per day. To get up to the next level in the Code for Sustainable Homes, a reduction to 80 litres per person per day, you really need a supplementary source of water.

In terms of supply, the number one thing that is missing is alternative sources of water. It lists, rightly, water efficiency measures and metering and all those technological improvements and improving leaks, obviously, which is a massive waste of the resource. About 25% of water in London leaks away. How we are actually going to get that deficiency met is key and there needs to be alternative sources.

That links into the next two elements. We do not have enough sewer capacity to take away our water that falls on London and is wasted away and waste water. The second question is whether we can make better use of those two resources. Can we make better use of waste water? Can we make better use of storm water?

In Melbourne, in Kingston City, they have done a natural water balance. They looked at all the water that is coming into the city and falling on the city and passing through the city, and all the demands that are on water in the city. They have shown that there was about 20 times the amount of water falling on the city and passing through the city in terms of natural resources than the non-potable water demand of the city.

In terms of the scale of opportunity, there is a massive amount of water on London or going through London which is not being used. In terms of supply, we are bringing it from a long way away to get it to us and then we are depositing that water a long way from where it originated and allowing it to waste away into the Thames ultimately and be washed away. If we can capture some of that, we have a big opportunity.

**Nicky Gavron AM (Chair):** Are we capturing it in new build at the moment and does the Infrastructure Plan allow for that capturing? We are doing huge amounts of construction.

**Michael Henderson (Associate Director – Sustainability, AECOM):** The discussion is different between new build and retrofit, quite markedly. New build, no, I do not think the opportunities are being taken. The London Plan does have a hierarchy of discharge options and it says reuse should be number one, but I do not know if development has actually been challenged on not connecting directly to the sewer to get rid of its water.

**Nicky Gavron AM (Chair):** What about the Olympics? We actually have in the London Plan that we want developers to have a dual system of water, one for potable or drinkable and one for grey water. At the moment, we drink only 2% of what we purify and we flush a third of it down the lavatory. Grey water would really make a big difference in terms of energy and water supply. What do the Olympics do?

**Michael Henderson (Associate Director – Sustainability, AECOM):** On the Olympics, we have a pioneering black water treatment that plugs straight into the sewer network and links that sewer water to supply a non-potable network around the Olympic Park and to all the stadium and it is used for some of the irrigation. After the initial irrigation for landscape demand tails off – because after a period, once it is established, it does not need so much – there is a surplus left in the black water treatment facility, which could go into the residential developments around it and the 6,500 homes around it.

**Nicky Gavron AM (Chair):** It could?

**Michael Henderson (Associate Director – Sustainability, AECOM):** It could. The network is already there but what it needs is the extension from the network into the development areas and then obviously the secondary network around it. There are a number of issues with that. We did a cost-benefit analysis looking at potable water and using the black water treatment from the facility onsite against grey water recycling and rainwater harvesting on the different plots. The black water treatment generally costs in processing terms about one and a half times the amount that potable water does. Potable water is a really efficient industry in the United Kingdom (UK). It is very well delivered --

**Nicky Gavron AM (Chair):** Is that why we flush it down the lavatory?

**Michael Henderson (Associate Director – Sustainability, AECOM):** Yes, definitely. It is not valued probably enough. Black water is about one and a half times. The grey water and rainwater harvesting options, which are a better comparator to black water because they are alternative sources, cost about six or seven times. That is all fine, but the risk of misconnection sits on Thames Water and it costs that risk so highly that if we took that into account, the one and a half times the cost of potable water would go up to about nine times the cost, because they want to make sure that there are no cross-connections and they have to keep checking them all the time. That is a real regulatory barrier in delivering these things and it is on the suppliers --

**Nicky Gavron AM (Chair):** Do they think we might drink the lavatory water?

**Michael Henderson (Associate Director – Sustainability, AECOM):** Yes, it is the suppliers' responsibility to make sure that you do not have a misconnection or a plumber does not misconnect --

**Nicky Gavron AM (Chair):** Thank you. OK.

**Michael Henderson (Associate Director – Sustainability, AECOM):** Yes, that is definitely a barrier.

**Nicky Gavron AM (Chair):** Yes. What is Thames Water doing about sustainable urban drainage?

**Michael Henderson (Associate Director – Sustainability, AECOM):** They are doing some private studies. Counters Creek [one of London's "lost" rivers and part of Thames Water's sewage system] is one of them. Counters Creek is perhaps the only one. There is very little. It is difficult for Thames Water. It is in a very constrained regulatory position. It has had massive austerity measures placed on it that it has to work through and it is easier and more sensible to have that valuable asset, than the green infrastructure which is quite disruptive and is taking time to come through. However, longer term, those things will undoubtedly be of benefit. I do not think they are taking it as seriously as they may be at the moment, but they will do as in 2017 competition in the water market starts to come in.

The other bit of the plan which I do not think is being addressed at the moment is the community benefits in actually seeing community infrastructure, particularly in the water sector, being looked at. If we start looking at community water resources much in the same way as we did with decentralised water and see Thames

Water's role within that and how Thames Water could actually facilitate higher quality, higher value development or high quality green development. Then get it involved in the design process, it is more of an opportunity for it to be seen as a better player in the community, raise its profile and actually be more competitive once the monopoly that it generally operates in is broken down. I would like to think that there is the potential to do that. However, looking at the next asset management programme (AMP) period, it does not seem to put much weight on it. Sustainable drainage systems (SUDS) are only mentioned three times in its new business plan. It is constrained by these five-year periods. I do not know if it is geared up to be fast enough to be able to deliver the aspirations necessarily in the draft Infrastructure Plan.

**Nicky Gavron AM (Chair):** We have a real problem there. A tiny amount of money is being set aside for the next five years across the whole Thames Water catchment area for SUDS. Because of time, I cannot keep coming back to Jeremy and asking him what he thinks of these issues, but would you log them, Jeremy?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Yes.

**Nicky Gavron AM (Chair):** We did not know this when we set up the meeting, but two of the Members have to go to other meetings. We might just come back to the circular economy and pick up all of them, but water and energy can come up in some of the questions that we are going to deal with when we talk about spatial planning. If we just look at what infrastructure is not in the plan, Navin, and come to you?

**Navin Shah AM:** All right. OK, Chair. This is exactly what I want to raise. There are, quite evidently, certain types of infrastructure missing from the plan or approaches that one would want to see to support growth that need inclusion in the plan. Can I have comments from the panel?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** If I could address that first, it was an explicit and deliberate decision not to look at everything and it relates a little bit to Andrew's [Lord Adonis] question about what happens next. The opportunity to write the Infrastructure Plan - how can I put it - was a chance, if you like, to think outside the box. To think outside some of the statutory processes that we have to go through in creating the London Plan, the Economic Development Strategy (EDS) and the Mayor's Transport Strategy and to think long-term to 2050.

However, we are relatively resource-constrained, we are a limited team and we certainly do not want to duplicate all the work that is already going on in the London Plan. We wanted to get a handle on what were the overall strategic and infrastructural requirements of the city to 2050, and we made some deliberate decisions about what we would and would not include which we set out in the document.

I make absolutely no apologies for that. We have written 600 pages of text on the infrastructure within the scope. We would like to certainly think about the infrastructure needs of healthcare and others, and incorporate those into the plan in due course. However we do not want to undermine, replicate or duplicate the existing planning process that goes into much greater detail about the land use requirements of all types of social infrastructure.

Therefore, what happens next is that we have a consultation, which ends at the end of this month. We look forward to the next iteration of the National Infrastructure Plan, the Autumn Statement, the budget and the general election. Before the general election, we will have had two meetings of the delivery board. It will have had, therefore, some substantial opportunities to comment on what London's position is and on what infrastructure needs we have. Doubtless, whoever is in power post-May 2015, there will need to be a debate with the new Government about the requirements in London and the funding needs of the capital. That is, broadly speaking, how, Andrew [Lord Adonis], the process is inevitably going to have to play out. It is not set in stone. We cannot control everything.

**Nicky Gavron AM (Chair):** We have it. Jeremy, because of time, we have it.

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Sorry.

**Nicky Gavron AM (Chair):** I think we have the message. Thank you.

**Navin Shah AM:** Before I invite comments from other Members and the panel, Jeremy, I do not have a problem with where you are coming from in terms of approaching this by not simply looking from within, but outside the box. I have no problem with that approach. However, I do have a serious problem when you are looking at major growth aspects over decades for which the plan is meant to cater, and when you have not included, for example, the health aspect in terms of an infrastructure plan for the National Health Service (NHS). One of the reasons is that the plan states that the London Health Commission will not have reported, but it so happens that it will be reporting tomorrow through Lord Darzi [Chair, London Health Commission].

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Yes, indeed.

**Navin Shah AM:** Would it not be appropriate that you do actually make comments and include a statement or a vision or a mission statement on that particular aspect? Also, to me, it is important that social infrastructure – probably medical facilities or health facilities being part of it – are also commented upon, because there are major issues including the educational aspirations of London's diverse communities, et cetera. I would like to see that incorporated as well, which currently it is missing. Are you happy to include that and comment on it?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Yes, we are. We thought there was not much point commenting on healthcare infrastructure given that the London Health Commission is running in parallel, but we would certainly like to incorporate its recommendations into the final plan. I would have no problem doing that. It is a very sensible suggestion.

**Nicky Gavron AM (Chair):** OK. That is helpful.

**Navin Shah AM:** OK. Does anybody else want to comment on this? I have a couple of other points but I will come back to that afterwards.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** You have covered a lot about health. I would make two comments.

One is that when you relate this back to how you pay for this, it is very difficult to consider how you might pay for some aspects of infrastructure without considering either their impact or the opportunity, perhaps for combining the way in which you might pay for things together. When you have a health estate, for example, you might well be able to use it in multiple different ways. That is one comment I would make.

The second is what I would term the 'management infrastructure', the way in which the GLA and local authorities effectively can invest, or ought to be thinking about the way in which they invest, in the co-ordination of services and the co-ordination of the delivery of infrastructure across London in the future. You made reference during the Games to the Transport Control Centre (TCC) and that showed us a glimpse of how London could be more efficiently managed, but you made the comment in the plan that it was inefficient in terms of manpower. The opportunity in the future exists through technological advances to probably slim that down quite considerably, and reap all the benefits of much more efficient management of the city, if you

like, and therefore more efficient use of the infrastructure the city has to offer. I would advocate more emphasis, perhaps, on that as a piece of investment because it does require investment to make it happen.

**Navin Shah AM:** Anyone else?

**Michael Henderson (Associate Director – Sustainability, AECOM):** I would reiterate the health aspect, particularly in relation to the delivery of green infrastructure and the role the local health partnerships can play in actually delivering preventative health measures. Similarly, in terms of the social infrastructure asset – and it goes back to Jeremy's [Skinner] point – there are a number of different things in social infrastructure and green space and playing fields and things like that, that should be a part of that assessment. That crosses over into what is informal green space or green infrastructure and how that is managed.

The only other one – and I think I heard some of the reasons for it not being assessed – is obviously the Thames Barrier and how that relates to the wider Thames Water infrastructure and its assets.

**Navin Shah AM:** All right. The other two aspects are the digital infrastructure --

**Nicky Gavron AM (Chair):** Navin, can I just ask for Finlay Kelly? Are you in the audience? Would you like to come up to a microphone for a minute?

**Finlay Kelly (City and Project Finance Lead, Future Cities Catapult):** That is fine, yes.

**Nicky Gavron AM (Chair):** Thank you.

**Finlay Kelly (City and Project Finance Lead, Future Cities Catapult):** Yes, my name is Finlay Kelly. I am from the Future Cities Catapult. The Catapult has been created by the Department for Business, Innovation & Skills (BIS) to help forward the Digital Cities agenda and the integrated infrastructure.

**Nicky Gavron AM (Chair):** I just thought it would be great to have that viewpoint here while we are talking about it.

**Navin Shah AM:** I am glad you are here because, on digital infrastructure, the plan covers requirements up to 2020 for digital infrastructure. Do you think that is right or should the approach be different and how different should it be?

**Finlay Kelly (City and Project Finance Lead, Future Cities Catapult):** We are a relatively new organisation, but from our discussions with industry and working closely with technology, technology is changing so quickly. Smartphones were not here a few years ago. Technology is advancing so quickly that to predict beyond 2020 is challenging and that is across all sectors. Also, you have to think about the life cycle of infrastructure and when you install a piece of infrastructure, how long it is going to be there and whether, if you install what you install today, it is going to still be the best technology in five years' time. If you think beyond ten years' time, it is very difficult – impossible, probably – to predict accurately. From our discussions with industry and with partners so far, building in obsolescence is what we have to avoid.

**Navin Shah AM:** What kinds of recommendations do you have for a form of mechanism to review this aspect of the plan?

**Finlay Kelly (City and Project Finance Lead, Future Cities Catapult):** None of this is going to be easy. That is certainly our view. None of this is easy. There are different models around subscription models, where

you pay on a subscription basis, which allows you some flexibility. Some of that is in the detail of the contracting and how you buy and procure infrastructure.

**Navin Shah AM:** OK.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Can I make a comment? The digital discussion tends to be around broadband capacity and mobile capacity and it tends to be focused on the elements and the provision of that. There is clearly a patchwork, if you like, across London that needs to be addressed and it is highlighted in the plan as an important feature.

One of the things that we could perhaps highlight a little bit more – and perhaps linking it with that comment I made earlier about management and the digital infrastructure needing to improve city management – is the opportunity that that might bring, by making the data provided through those kinds of investments more available. The work we are doing in Christchurch in New Zealand, where we are developing what is called the ‘Sensing City’, was intended to be a boost to the economic recovery of Christchurch after the earthquake. They are requiring every private sector provider and every public sector provider of infrastructure to invest in sensing equipment, from which the data is shared and the city is then managed in a more efficient manner by overlapping all of that information and looking at how it relates.

**Nicky Gavron AM (Chair):** Brilliant.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** When you look at what they are looking at, they are looking at water quality; air quality; power use; traffic congestion hot points and cold points, et cetera; the use of tarmac, which is quite interesting given that we rather inefficiently use the amount of tarmac space that we have; health impacts; noise and light. This is just the rolling-out of the first phase. The intent is in part better management of the city, but the greater intent is to share that information with small businesses across the city that can then develop service offerings, if you like, which they can export from the expertise gathered in understanding how to use that information in different ways. That is intended to be an economic growth engine for a city which is in recovery.

London has a fantastic opportunity, I would have thought, to build on that kind of model, to do all sorts of other things and to provide that same platform for its burgeoning technological industries.

**Nicky Gavron AM (Chair):** That is so interesting. I just want to ask Jeremy something. Do you mind, Navin? At the Examination in Public again and then looking at the Infrastructure Plan, I am completely confused now about what we are requiring of developers even in terms of connectivity. It is not clear that we are requiring anything of them, actually. We are going to rate them. We are going to do some survey which will see how good they are. Of all these new builds, what are we requiring? It is the fourth utility, you say, but what are we requiring?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** It is a generational issue as well depending on which occupier of housing. Older generations tend to be – not always but sometimes – less concerned. I do not have the specific London Plan chapter and verse to hand but, broadly speaking, we want to encourage a market-led solution through better information about what the connectivity ratings of the properties are. Clearly, as we anticipate, if there will be greater consumer demand for the ubiquitous high-speed, affordable, reliable connectivity, we would assume that the market will follow that lead up to a point.

Indeed, London is actually one of the better-connected cities. We often do London down in that regard. The statistics show that we are probably number one to five in terms of digital connectivity, depending on which

survey you choose to look at. The position is much stronger than some of our competitors - including Mr Bloomberg [former Mayor of New York City] - would have us believe.

**Navin Shah AM:** If I can move on to my next question under the same heading, probably again Finlay might want to respond to start with. How can behaviour be changed to reduce demand on infrastructure?

**Finlay Kelly (City and Project Finance Lead, Future Cities Catapult):** From the research we have done, there is obviously capacity in infrastructure that could be utilised. Things are not at capacity 24 hours a day. If you look at energy, I suppose energy efficiency measures are reducing demand for energy and they are quite successful. Certainly, energy efficiency has been the most successful demand measure. With a growing city, demand is going to keep increasing.

**Navin Shah AM:** It is a question of how the behaviour could be adapted or given a different direction to reduce the demand.

**Finlay Kelly (City and Project Finance Lead, Future Cities Catapult):** No, but if anyone else wants to --

**Navin Shah AM:** Does anybody want to come in or to comment?

**Michael Henderson (Associate Director – Sustainability, AECOM):** Obviously we need to design for peak performance. The digital revolution will allow us to smooth that peak down and allow us to spread some of that loading. Very simple things around managing the time at which people use the Tube and go on it can actually increase a lot of the capacity and similarly the way in which we all have peak demand for the energy infrastructure in offices and the amount of wastage there is there. Learning smart control in peak times, such as independently remotely shutting down light switches which are not being used optimally, is a way of doing it. That goes across all infrastructure and water infrastructure as well.

**Nicky Gavron AM (Chair):** In looking at the funding and the funding gap, one thing that was very stark was that with digital investment, you are more or less saying it does not need any funding.

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** I would not quite go that far, but it is remarkably inexpensive compared to all other infrastructure types.

**Nicky Gavron AM (Chair):** I was very struck by that and impressed, but now I hear you say we are going to leave it to the market and I want to just ask Jerome. Do you think that is the right way of going about it, or do you think there should be more pump-priming?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I certainly think the market is capable of delivering it but it might need a bit of a push in doing so. On your point earlier about what a developer is required to do, very often developers, depending on the particular market sectors they are investing in, will or will not invest in some of the high-tech equipment for the management of their buildings, depending on whether it generates value, et cetera. Certainly they will perhaps not share the information they gather through the systems they invest in unless required to do so, and that is one area where perhaps more value can be obtained from this inexpensive investment that is coming up front.

Rather than query too much the concept that it is inexpensive to invest in and that the private sector can deliver it, I would put more emphasis on the value of the information being gathered. Going back to your point, I would say there is emerging evidence. There is a big project going on in Hong Kong at the moment where the more information and knowledge that is known about how your neighbour is living their life, if you like, the more it affects the way you live your life more efficiently. If you think your neighbour's electricity bill

is half yours because they are living life in a slightly different way and if you have that in front of you on a digital panel which tells you just how much energy they are consuming, it is one of the biggest drivers of an increased reduction in demand.

The point I am making is that there is immense value from the sharing of the data that is being gathered inexpensively, if you see what I mean. I would place a lot more emphasis on that and the requirement for the sharing of data, perhaps, more than the requirement to invest in digital infrastructure of that sort. Sensing equipment is generally cheaper and cheaper these days.

**Nicky Gavron AM (Chair):** On the other hand, also, there obviously needs to be strengthened regulation. If you are leaving it to the market, you have to guide the market. You can create and shape markets with regulation.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Yes, it is regulation, but also planning control --

**Nicky Gavron AM (Chair):** I meant planning, actually. Sorry.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Planning is the primary opportunity and is a relatively simple thing to achieve through the planning process, I would have thought.

**Nicky Gavron AM (Chair):** All right. That is one of the lessons we can take away.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** I just wanted to add that planning can sometimes be a problem in this respect. We have all been aware of some examples of 'predict and provide' and in fact water supply has been perhaps one of those areas, mineral supply and so forth in the past. When plans look to project forward things like waste quantities to the year 2050, I take Fin's [Kelly] point. It is incredibly difficult to do.

If you look back 35 years from where we are today, think of how you were living your life relative to how you are now. We spent £1 billion last Christmas alone on downloads. That is a phenomenon. You could not have downloaded anything in that sense 35 years ago. That itself dematerialises that whole £1 billion of consumption.

There are ways in which we are changing the way we live our lives that are changing what we consume and therefore - from the perspective of, for example, waste - what ends up in the waste stream. The one thing we know as we look forward to 2050 about waste is that it is going to look very different to how it does today. What we do not know is how different it is going to look. It is really an interesting thing to speculate about.

However, if you want to reduce demand for infrastructure and waste, one of the things you do not do is project a demand forward that is greater than what you might need. This is an issue within the plan going out to 2050. It takes forward the projections in the plan itself which are based around population projections and it takes constant per capita waste risings from the early 2030s out to 2050. If we really were serious about preventing waste and so forth, we would look to do it. We would not build into our projections that we were not going to do it. If we are looking forward and if we are going to think outside the box, then we have to think more imaginatively about how we are going to address that.

In terms of what you can do literally today, I remain frustrated after three successive times when the Government came close to - and in fact did once but then withdrew from - implementing legislation that allowed households to be charged for the amount of waste they throw into the residual waste bin. We have a



frustrating experience as a company now of being virtually European experts on this, but being unable to implement it or think of designing it in our own country, because we are one of very few countries in Europe which has repealed the law that would have made that legal for local authorities to do.

**Nicky Gavron AM (Chair):** It is charging residual waste, not recyclables?

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** It is just about residual waste. If you are talking about how you are going to fund infrastructure going forward and you want to, as it were, shift away from a system based upon a reliance on a generation of revenues from council tax and from the Revenue Support Grant (RSG), you have to think about looking at mechanisms for charging. The bizarre thing is that we know. We have plenty of experience that shows us we get reductions in the quantity of waste that people generate at the margin. We get an increase in the proportion that people recycle.

By the way, I am not talking about a tax. I am talking about a charge and there is a very clear distinction in the literature between the two. One is effectively a way of recouping the cost of a service - the charge - and the other is something that is an unrequited payment that goes to a treasury. This is not a tax. It is a charge and it is simply changing the way we pay for the waste management infrastructure and services we have, in such a way that we use them more efficiently.

**Nicky Gavron AM (Chair):** That is to incentivise recycling as well, presumably?

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** And waste prevention. In principle, you could use it to incentivise a range of different standards. In Denmark, on the water side, they have really interesting ways of charging on water. In particular on the water abstractions, which actually have the effect of pushing the water companies to address leakage issues. If you charge on the actual supply, nobody tends to worry about the leakage. If you tax water companies on abstractions, you change their behaviour and push them to reduce the amount that is lost between what they are taxed upon and what they actually supply.

**Nicky Gavron AM (Chair):** That is helpful. Thank you.

**Navin Shah AM:** Chair, I am mindful of time because both Steve and I need to leave at 5.00pm.

**Nicky Gavron AM (Chair):** We could go to Steve. I know.

**Navin Shah AM:** If I can go to my next question with a supplementary as well, that would help. What are the changes for future-proofing London's infrastructure? Jerome, you have already commented on this before. Would you like to touch upon that? Also, to what extent would making better use of existing infrastructure through retrofitting, for example, help towards reducing the need for investment in new infrastructure? You might want to give some examples.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Let me start with the future-proofing. The 2050 Infrastructure Plan is just a uniquely tremendous opportunity, frankly, to plan for the layering and functionality - I mentioned this at the beginning - and the ability to think that one particular piece of infrastructure can serve multiple purposes. To date, with the way in which we plan infrastructure, there are plenty of examples - Crossrail might be one and High Speed 2 (HS2) might be another - where we tend to start off with a singular piece of kit and get a long way down the road of designing that piece of kit, before we start thinking about whether it could actually serve another purpose as well.

The advantage we have with the 2050 plan is to say that, yes, we need a circular orbital tunnel, perhaps, as it suggests, but that that tunnel should do far more than just provide a new road or a new railway. It could deal

with the heat energy or the energy issue that I mentioned earlier. There are other examples, for example, where tunnels are used for water storage. They are doing that in Seoul at the moment for rainwater storage and a reduction in the impact on sewerage networks, et cetera. That is just an example. However, what we can do for future-proofing purposes is start the planning process now and to put together this list of pieces of investment that we need to look at and look at the ways in which we can actually intertwine them a bit more effectively. That is certainly in terms of planning future pieces of infrastructure investment.

With the existing infrastructure, retrofitting is very, very difficult, largely because there is a dislocation in many aspects between the benefits derived from addressing and improving an existing piece of equipment or an existing building, and the benefits derived from that being realised by the person investing in it. If I can give you an example, in New York they have invested many millions of dollars in new swales in an area called Newtown Creek in New York. There are 5,500 new swales in the roadways alongside the pavements which store water in times of heavy rainfall and they reduce the pressure on existing sewerage networks. The city does not actually benefit from that when the sewerage networks are run by a private company and there is no relationship between the savings being made by that company and the cost of the investment by the city. Therefore, the relationship between the two is perhaps where the difficulties lies in terms of the amount to which we can encourage people to retrofit to the benefit of others, if you like. There needs to be a better realisation of the return on the individual or on the investor before we can see it taking place at a large scale across London. Did I make my point clearly?

**Navin Shah AM:** Yes, sure. Does anybody else wish to come in?

**Michael Henderson (Associate Director – Sustainability, AECOM):** That last point is something that I would be aware of in restructuring in the document, or having within the document. It needs to be couched in language which is about the benefit to the individual, the business and the consumer of all this infrastructure. It is still very much in infrastructure terms and that would be a useful way of doing it.

The investor versus the beneficiary is always a challenge for the sustainability community to grapple with and I do not think that is going to change here. However, more community investment into infrastructure is important. If I might give an example, a similar one from San Francisco, they are further ahead on the curve of facing climate change and cannot afford to upgrade their storm water infrastructure fast enough. They went to the business community and said, “If we had a major event now, this is going to be out for 6 to 12 weeks. What is the cost to your business of that? The cost to business is massive. If we can reduce that to one week through this investment, how much would you be willing as a business community to allow us to do that?” They put up the capital to do that and then the community and other businesses invested in those infrastructure bonds and took a return from that. Having a vested interest in the infrastructure is something that can help future-proof it, because then everyone is a part of it. That is coming back to the language and how it is described in the plan.

The swales are what I was going to pick up on. As an advocate of some green infrastructure approaches to this, we have much more resilience if we keep these things above the surface for as long as possible, and we design it in above surface, which gives a higher design quality. We are able to use that to capture first flushes of water and prevent all that pollution going into our waters and there will be less cost on actually doing that in the first place and we are just managing it more effectively. That is much better than burying it underground with the risks that there are going back to it.

On the digital city element of it, just going back to that briefly, there is a real danger of being over-reliant on the digital network and becoming embedded too far into it. I do not know what the answer is, but there needs to be something around how we have become overly reliant on those systems.

Another element but slightly different is that at the moment we have several different providers providing all of this infrastructure, and they are presumably repeating work over and over again to enable different communities to have access to their different products because it is being funded by the private sector. You are going to have three to four times the work on the street that you would be anyway. If that is just the communications people and then the water company comes along and the electricity company comes along and we are doing it over and over again, we are not going to do it. An integrated approach to all these things and having them all in the same locations with ease of access and ease of maintaining is crucial to allowing it to be managed effectively.

**Lord Adonis (Labour Peer):** Also, that is an interesting point because you certainly see that as well with some of the green infrastructure provision. Some developments are often made effectively contingent on the provision of – particularly where there is an impact on biodiversity – ponds with newts or something, and what tends to happen is you get each individual development often putting in place some rather trivial offsetting scheme. Actually, if it was more co-ordinated at a strategic level, you could with a smaller sum of money put in place much better and more effective measures. Probably, each of the developers would be paying less money for the compensating infrastructure as well.

**Michael Henderson (Associate Director – Sustainability, AECOM):** Co-ordination is key. Take Nine Elms. There are 12 developers all working in Nine Elms and Transport for London (TfL) working to change the streetscapes massively with a big green spine going down the middle. However there is no joined-up water management plan across the whole of that site. Not all of them can actually take the water that is falling on the site and reuse it in the buildings because a lot of them are quite dense with small profiles. However, if you take that whole site as a catchment, we could manage the water in that area much more effectively. At the moment, there is a big plan for a sewer connection, but it would actually reduce the size of that sewer connection, which reduces the bills to those developers and it goes around.

**Navin Shah AM:** Jeremy, you are supportive of everything said, I understand?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Yes. We will probably get on to it, but that is precisely why as a first step to try to achieve greater integrated delivery of infrastructure we want to bring together the infrastructure providers plus their regulators to tackle both the short-term opportunities and the existing opportunity areas in London, the ones that are hot at the moment. We need to put in place at a very practical level these kinds of measures, but also to tackle the longer-term regulatory barriers, perceived or otherwise, that seem to prevent that thinking, and then also many other challenges that go beyond this in terms of the incentives on the organisations. If there is a cost advantage to delivering an integrated solution, it would be odd for commercially-driven privatised utilities not to take those opportunities. That will be the test of whether the marginal additional cost is justified by the marginal benefit. There should be a strong commercial imperative to joining up, but then there will be longer-term regulatory standards that we may want to adopt, but bringing everyone together is the only the first step. This is a long road.

**Nicky Gavron AM (Chair):** OK. We have to agree amongst ourselves that you will delegate authority to Steve [O'Connell] and me.

**Navin Shah AM:** I am happy to do so.

**Nicky Gavron AM (Chair):** Are you happy to do that?

**Navin Shah AM:** Yes.

**Nicky Gavron AM (Chair):** OK, that is if you are going to leave, so that we --

**Navin Shah AM:** I am going to leave in five minutes, Chair.

**Nicky Gavron AM (Chair):** You are delegating authority for us to agree the response to the Mayor's Office?

**Navin Shah AM:** Absolutely, without a problem. Yes, and with full confidence.

**Tom Copley AM:** Yes, I think Steve's [O'Connell] question was set to go. The question is which areas of London should be prioritised for development. Within the Infrastructure Plan, it is clear the focus is on opportunity areas and intensification areas. Is that right? Do you want to tell us a bit about that?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** In the short term but up to the London Plan horizon, it is the London Plan areas for development opportunities and areas for intensification and major sites, as identified. In the very long run of course we need to think about where the marginal additional growth in London's population goes, and start to think about where we may see that growth occur. That is kind of a nod to what is a very fundamental planning issue that affects London and the south east, that will not be resolved entirely to everyone's satisfaction, I suspect, until we are through a general election and a new mayoral election. However the new mayor will have to grapple with the questions of the green belt and so on and so forth which are not going to go away.

**Tom Copley AM:** Yes, this question and the next question sort of fit together quite well, so I will do them at same time. After 2025, is basically the implicit suggestion that the green belt is going to have to be looked at?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** No, I am not saying that. What we say in the plan – and I think my planners would agree with this position – is that we believe and have identified sufficient capacity for growth within London for the next ten years. Beyond that time, history shows that new opportunity areas and areas for intensification crop up. We know that London is not particularly densely developed, particularly in its central and inner London areas. We are a relatively densely populated city in suburbia, which is somewhat counter to the common perception, and that therefore there may well be scope for greater intensification of the city. However, that will be a very public and political decision and it will change the fabric and nature of the city in the 2030s.

**Nicky Gavron AM (Chair):** Can I just come in? There is a very good point, it is interesting and it is quoting your report, but if 10% of semidetached areas in the suburbs were doubled in density, it would produce getting on to 500,000 homes.

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** There is huge capacity for growth. It is whether it is acceptable. We can put growth in almost all sorts of different shapes and sizes.

**Nicky Gavron AM (Chair):** That is 10% of all the suburbs, yes?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** I am interested if you stand on that platform, Nicky.

**Nicky Gavron AM (Chair):** There into our suburbs, which are beautiful and wonderful, and there are others. Anyway.

**Tom Copley AM:** As we know from the Housing Committee, even in estates where it is generally agreed, for example, that they should be rebuilt, the resistance from residents to that sort of thing is often huge. Therefore, you are right. It is a political decision that needs to be taken.

In terms of the opportunity areas, you have 38 opportunity areas and in the latest draft of the plan only 11 have planning frameworks agreed. Is there a danger of a sort of bottleneck here in terms of getting this development and these frameworks agreed, and then the development going?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** I am probably not close enough to the delivery of opportunity areas to be able to comment on that. It is more for members of the planning team, but we will see an uptick in the rate of delivery, I suspect, as we overcome the great recession and it is easier to get financing for large-scale development projects.

**Michael Henderson (Associate Director – Sustainability, AECOM):** The first thing is I just want to make a point that there is a difference in what we are looking at as an Infrastructure Plan and the growth areas and the intensification areas. There is a different spatial relationship. You need to upgrade the network and infrastructure right across the board and in these little spots where there might be a hotspot of intensity, you need to take into consideration that general growth as well.

In terms of the network and the value of increasing investment in infrastructure across that network, I would take the green infrastructure as part of that and the green belt as part of that as well. The green belt is not overly well-used in terms of its ecosystem services at the moment. It is there primarily as a geographical boundary. If there were to be some level of green belt review, it needs to be assessed as you would any other infrastructure in a built-up area, and what the value of that piece of land is doing. Is it giving you water storage and water-cleaning qualities? Does it have biodiversity on it? Is it being used for recreation and is it being used for all these different things? If it is not and there is greater need for it to be used for development and if it has a transport connection that can give an uplift to the value of those surrounding areas. And if you can use that uplift in value to actually pay some of the other infrastructure, then it should be used to improve the green belt and its accessibility. The green belt is not really very accessible for a lot of people.

**Tom Copley AM:** Do you want to make a comment?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I would make three points. The first is picking up on your point about the number of planning frameworks that are in place. I am sure Jeremy [Skinner] is right that there are more coming. However I would also almost warn against trying to do too many things in too many places all at the same time, if you like, when we have limited public sector resource. Many of those opportunity areas are reliant on infrastructure investment for development really to take place. They also have huge potential for quite large-scale growth capacity to be realised. In somewhere like Croydon, 9,000 new homes in the space of ten years is quite substantial growth, plus the commercial floor space that goes with it, but it does require quite a large amount of public sector and private sector investment in infrastructure to make that happen.

There are a lot of lessons to be learnt from the success, for example, of King's Cross, the success of Stratford and perhaps the success in Elephant and Castle, where concentrated resources, concentrated planning effort and so on has been put on singular places. Public sector and private sector investment has been made in concert with each other and the benefits have been realised actually way beyond the initial area of intensity of that investment. Stratford is a case in point. You are actually seeing quite a lot of change happening beyond the immediate Olympic boundaries now and spreading that --

**Tom Copley AM:** You advocate a more targeted approach --

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I would advocate a more targeted --

**Tom Copley AM:** -- because then it has a knock-on effect?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** The scatter-gun we have also seen the effects of over many, many years or decades in London, where we have tried to do that. You see in Stratford 88 master plans before the Olympic one and the Olympic one delivered, but it did not deliver because of the master plan. It delivered because of the concentrated effort on investment. The last --

**Tom Copley AM:** Are 38 opportunity areas too many?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I do not think it is too many. It is right to say there are opportunities here because there are also windfall opportunities that will come from these plans, and the planning policies need to be permissive in allowing for those to happen. I really would advocate the layering of infrastructure investment on top of that sort of planning regime, if you like, of the framework to say, "We will invest in a concentrated fashion within particular areas".

**Nicky Gavron AM (Chair):** Can I just say, Jerome? About 13 or 14 have planning frameworks at the moment, but in a sense that has been going on, that kind of thing.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I agree. I guess what I am advocating is making sure that we do not move away from it too fast.

Sorry, Nicky, a couple of other points. The second is that the one area we do not spend a lot of time thinking about is land ownership opportunities. When you start to think about land ownership where windfall opportunities might occur - for example, local authority-owned estates - they are still huge across London and have enormous opportunities. I take your point about persuading local residents that an opportunity is really an opportunity, when it involves your own house being demolished perhaps and replaced. However at the same time a lot of those 1930s or 1960s estates are poor in terms of condition and actually in terms of density could deliver a lot more than perhaps they are delivering at the moment, with a better-quality lifestyle for those residents, who would benefit from that.

Beyond that, there are also big private landholdings around the place. A case in point, in Croydon you have big commercial entities - and this is repeated across London - and 1970s kind of shopping centre developments, where actually the economy of those centres is weakening in their current state. There is a lot more to be gained from the redevelopment and continuing with some town centre type provision, but actually the provision of additional housing as part of those redevelopments provides quite a substantial opportunity and they tend to be in single ownership.

That leads on to my last point. London could look, as referred to previously, beyond its boundaries. Outside the green belt, because if you apply that same thinking, how many towns do we know of in Hertfordshire and Buckinghamshire and so on where you have those kinds of same situations, the 1970s invested shopping centre, town centre heart, where relatively small numbers of ownerships exist? They are easier to pull together and easier to construct a quite substantial change in terms of housing delivery at the core, where it is less intrusive and has less impact on existing residents because there are fewer of them, particularly in new towns. I worked for English Partnerships for a while with the Commission of New Towns and I would say there were many, many such opportunities, actually, Stevenage and Harlow. There are a number of towns which have those kinds of opportunities for this and it all comes to relatively few land ownerships. That is what we should be looking for.

**Nicky Gavron AM (Chair):** Densification?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Densification of the centre before we necessarily densify the very edge or expand the very edge, I should say.

**Nicky Gavron AM (Chair):** Yes, yes. What do you think about that, Andrew?

**Lord Adonis (Labour Peer):** I entirely agree. Picking up Jerome's [Frost] point about estates and densification, in terms of meeting housing targets on brownfield sites, this is going to be an absolutely critical issue over the next 20 years. Having looked at the patterns of ownership in some of the inner London boroughs, the most striking fact is the dominance of local authorities still as landowners. The figure that sticks in my mind is the London Borough of Southwark, where 43% of the land in the London Borough of Southwark is owned by Southwark Council. In most inner London boroughs, it is between 25% and 35%, mostly in respect of existing estates, most of which have not been redeveloped in the last generation. As Tom [Copley] has said, there are big issues around those, but so far the approach has tended to concentrate on the doomed estates.

You mentioned Elephant and Castle where the degree of social crisis is so great that some form of solution has been thought to be imperative and the opportunities for densification much more widely are there. Having a proper plan in place – which would involve really serious collaboration between public and private sectors and between the Mayor and the boroughs – is going to be a really big issue for the next 20 years.

**Tom Copley AM:** Yes, absolutely. It is interesting because on the Housing Committee we are looking at this very issue at the moment. The issue of whether or not you refurbish estates, whether or not you knock down, rebuild, increase the density, cross-subsidise and things like that. I suppose there are good examples and there are bad examples. There is certainly of course a worry amongst residents, not just about losing their homes, but also about, in some cases, the fact that there is less affordable and social housing than was there before, despite the fact you are building a whole load of private housing as well. There are other examples, for example, in Camden, where they have increased the amount of council housing through doing this, so there are good and bad examples.

We are in danger of straying on to some of the work of the Housing Committee, but is part of the problem access to finance for local authorities? Southwark Council might own 43% of the land, but it cannot leverage the finance to develop it itself and it ends up going into partnerships with developers, sometimes which perhaps do not deliver necessarily what the community wants. Then there is also the issue of designing places that people want to live in. We talk about density and intensification, but you actually need to build homes that people want to live in. It is something that the Create Streets project is very keen on, actually, the design of the homes as well as the amount of homes that you get. Do you have any thoughts on that and how you can build decent communities that people want to live in?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** If I could take the opportunity, sorry, Chair, may I be given leave to depart at this point, as I have a speaking engagement in about 45 minutes which I need to get to on the Infrastructure Plan?

**Nicky Gavron AM (Chair):** OK. We did not know that, sorry.

**Lord Adonis (Labour Peer):** Chair, I need to leave in a few minutes too.

**Nicky Gavron AM (Chair):** Yes. We had better --

**Tom Copley AM:** Can I get a final comment just before you go, Jeremy?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** Yes, quickly.

**Tom Copley AM:** Can I ask you about the Heathrow issue? One of the scenarios in the Infrastructure Plan involves this new borough of Heathrow and a huge number of new homes and jobs there. Now that the Airports Commission has rejected that, will that be taken out of the Infrastructure Plan?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** I have not yet had the opportunity to discuss that with the Mayor.

**Tom Copley AM:** OK. Would you like to express a view as to whether it should be taken out of the plan?

**Jeremy Skinner (Senior Manager – Growth & Enterprise, Greater London Authority):** I think, as you know, that would be stretching my impartiality.

**Tom Copley AM:** Yes. Some of our other guests might want to express a view – I am not sure – as to whether or not that should come out.

**Lord Adonis (Labour Peer):** Clearly it should come out because it is not going to be going anywhere, is it?

**Nicky Gavron AM (Chair):** Andrew, we just wanted to check – sorry, we did not appreciate you were leaving just now – on deliverability. You were anxious to add some more comments on that and as we are going to look at that section **quite soon**.

**Lord Adonis (Labour Peer):** There is a big missing middle section in moving from the consultation on this plan to --

**Nicky Gavron AM (Chair):** Do not worry. We will make sure Jeremy [Skinner] gets a transcript.

**Lord Adonis (Labour Peer):** Yes, and there are two aspects to it. The process of agreeing with central Government what the plan will be in respect of London and also the fiscal devolution issue and how the Government is intending to handle the issue of devolved resources. The relationship between devolved resources and London itself then financing more of its infrastructure is going to be a critical issue – whether it chooses to relate devolved resources specifically to projects which are in the Infrastructure Plan like Crossrail 2, or to leave these resources entirely at the disposal of the Mayor, the GLA and the boroughs. I imagine the Committee will have views on that, but this is a very live issue not only with the Government, but with my party as well as to how that issue is handled and we would welcome your advice.

I was particularly keen to attend this afternoon. If we are going to be devolving significant additional tax revenue, particularly the proposals in the Travers Commission [an independent Commission chaired by Professor Tony Travers to examine the potential for greater devolution of both taxation and the control of resources] for incremental property taxes, then the relationship between that and key infrastructure priorities over the next 10 or 20 years is going to be crucial. Just to elaborate a little. My best prognosis is that central Government would be very reluctant to devolve significant additional resources without any connection made to specific infrastructure priorities, which otherwise it would fall to central Government to at least partially fund thereafter. How that relationship is established between devolved resources and key infrastructure priorities will be critical to decisions taken on fiscal devolution, and taking forward the Infrastructure Plan.



**Nicky Gavron AM (Chair):** You, above all, I guess, would accept the fact that the Mayor has – sorry, it is just because you are about to leave – had a lot more authority, power and investment in terms of transport than he has had in virtually any other area, and that has allowed him to actually prioritise and invest and so on.

**Lord Adonis (Labour Peer):** It is true. There have been significantly wider powers in respect of transport than other citizens and devolved institutions enjoy. However, what I am struck by is that the principal power of the Mayor, when it comes to significant new infrastructure projects, is not the use of his own resources. It is his capacity to influence the Government in the use of its resources, and prioritising projects within national infrastructure spending and being prepared to, in initiatives like the supplementary business rate, essentially create vehicles which, though they may have wider application, have been essentially established for London. It is very, very telling that in respect of fiscal devolution the debate has started with London. It was [Professor Tony] Travers and the London Finance Commission --

**Nicky Gavron AM (Chair):** Which triggered this Infrastructure Plan.

**Lord Adonis (Labour Peer):** -- which triggered the whole thing, which triggered the Infrastructure Plan and has also, of course, triggered the wider debate about devolution. Clearly London is going to be ahead of the pack when it comes to the capacity actually to develop a plan which could take advantage of devolved resources. As I say, the biggest thing here is the collaborative relationship between the Mayor and the GLA and central Government in, on the one hand, identifying key infrastructure priorities which will drive growth located in the capital and, on the other, being prepared to devolve resources in respect of them with some degree of flexibility for the Mayor and the GLA in how those resources are used and how they are packaged with other devolved resources. This is clearly going to be a pivotal moment in policy in this area.

**Nicky Gavron AM (Chair):** That is helpful. Do you want to add anything, Tom?

**Tom Copley AM:** No, that is fine.

**Nicky Gavron AM (Chair):** Unless, Andrew, you have any --

**Lord Adonis (Labour Peer):** The detail of infrastructure priorities in the areas we have discussed, I defer to my colleagues, who are much more expert than I am.

**Nicky Gavron AM (Chair):** OK, thank you. All right, we will let you have the transcript. Tom, you are in full flow.

**Tom Copley AM:** Yes, question 6, we covered quite a lot of it.

**Nicky Gavron AM (Chair):** Have we covered it all?

**Tom Copley AM:** It was about maximising available space and how we can maximise available space by unlocking land for development, which we have pretty much covered, have we not?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Just picking up your last point about design, it is absolutely the case that good design – in both the public realm and the buildings in any sort of redevelopment process – is absolutely crucial to the process of convincing and making the case for the transformational change. There is a very good case study of this in the athletes' village in that it was the highest-density development – and still may well be the highest density development – permitted in London. It certainly was at the time and there were many, many critics. In fact, I had to face up to many, many critics in my last role in the Olympics that called it 'Eastern European bloc' design and so on. However those critics have

ebbed away the more that you see the way in which it now has been delivered and is being occupied by residents. The reason it works is the combination of good design in the buildings and, perhaps more importantly, the relationship with good design in the public realm that relates to those buildings.

Incidentally, the public realm includes all the infrastructure layering that we have talked about. The swales, the recycling of water and so on form features within the landscape which form part of that. I took a walk around the athletes' village the other day and I really do feel it now feels like a piece of London that could be replicated elsewhere, where even I might admit the jury was out until we saw how it was occupied and how it was being used. I do think there are some benchmarks there, both European as well as now UK benchmarks, that we can draw upon, where higher-density better design can lead to a convincing case for improvement and densification.

**Tom Copley AM:** Yes, and obviously because we do not want to repeat the mistakes of the past, building places that are not well designed and then you are stuck with them until --

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Yes.

**Tom Copley AM:** Great, OK. I think that is me done.

**Nicky Gavron AM (Chair):** Can I just ask while we are on deliverability? It would have been helpful to have Jeremy [Skinner] on this, but I know the Infrastructure Plan talks about the silos. You have talked about the silos to a certain extent between utilities, but in terms of deliverability I am terrifically aware of the way different sectors of the industry do not join up. It is great that we have two sectors of the industry working together on this panel, but do you know what I mean? We have the chartered surveyors and the mechanical engineers and the electrical engineers and so on with all their institutions and many other institutions. Noel Farrer is in the audience, the President of the Landscape Institute. I am just interested in whether you think we are getting the collaboration that we really need and how we can incentivise more collaboration. I do not know who wants to have a go at that.

**Michael Henderson (Associate Director – Sustainability, AECOM):** Just in my area, water service and design, it comes very simply to me as to the stage in the design process at which the water companies are engaged in the discussion around drainage and water management, and if you can get them engaged earlier, there is an opportunity to influence those designs and influence how a community will look and feel, much like the athletes' village. The reason those places are a success and the Olympics was a success is because the delivery of those things were thought out much earlier in the design process than they will have been usually, when you just get a planning application and you sort out my drainage connection or whatever it might be. That is one.

Then, similarly, there is the link between green infrastructure and transport corridor routes, which I do not think we have really touched on. There is a lot of transformation around the upgrade of roads and the changing of roads, particularly when you bring in cycle paths and things like that. All those buffer areas between the road and where people are cycling could be green strips, which could have a water management function, but they are not at the moment. If you see any of the designs, they are all quite hardscape, so it is all really about where it comes in in the design process, and if that could be teed up right, then it would work more effectively. That is down to organisations such as ours as much as some of the providers.

**Nicky Gavron AM (Chair):** It is down to the organisations and the institutions, you think?

**Michael Henderson (Associate Director – Sustainability, AECOM):** Yes.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** That is a fair comment. As organisations, we have a duty to be more joined up and certainly we are making the effort. I am sure you are making the effort in your organisation. The thing I would comment on is the strength of the client and the relationship that clients in these development projects form with the institutions.

I keep harping on about the Olympics, but we had a wonderful relationship with the Landscape Institution, with the Royal Institute of British Architects (RIBA), with the Institute of Civil Engineers and with all of those institutions. When we needed to make strong cases for the utility provider perhaps doing something different or a different aspect of design to be emphasised or rejected, we could rely upon those institutions actually to back our cause and they proved very valuable in doing so. They proved valuable both individually and also in concert with each other. That sort of push-and-pull kind of relationship between a strong client – and I would advocate that the ODA was a strong client – and the institutions and a planning authority actually that is prepared to say no as well as yes into design.

The layering of design aspects was a critical element that led to a successful design on the Olympic Park and actually in most cases around London. If you take King's Cross, the same is true there, where you had a private sector developer with a similar sort of relationship with the institutions and so on. That sort of tripartite relationship, institution, planning authority and strong client lead is what can deliver change in the behaviour of consultants, utility providers and all of the different elements involved in the delivery of a good outcome.

**Nicky Gavron AM (Chair):** Yes. You have chosen two examples that really stand out and one is where you have in a sense public sector led but with an enormously intelligent multi-headed client, yes?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Yes.

**Nicky Gavron AM (Chair):** The other a private developer, also a very enlightened developer.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Very enlightened, but not to be underestimated. The relationship that Argent LLP [Property Development Services] formed with Camden in that example in King's Cross was crucial.

**Nicky Gavron AM (Chair):** OK, so the two working very closely together?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Very, very powerful. A local authority who wanted to see change and was prepared to both say yes and no in order to get a good quality outcome from what the developer was promoting. As well as that relationship then with the institutions, who helped the argument around public realm, around the quality of design and around the utilities investment.

**Nicky Gavron AM (Chair):** How could we make that happen in a more ubiquitous way more generally?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** We relied quite heavily on the Commission for Architecture and Built Environment (CABE) at the time, to shout loudly about the advantages of that kind of relationship. I am sure there are other institutions now and the GLA actually, in fairness, does also shout quite loudly about that and make case study examples of those kinds of good practices, but it is difficult to require it. It is very difficult to require it through planning. It is much more an advocacy-type role, I would have thought, and a promotional one where institutions are the key.

**Nicky Gavron AM (Chair):** Right, OK. Yes. There is somebody in the audience, Cedo [Maksimovic, Professor of Urban Water Systems, Imperial College London]. Is Cedo here? Cedo was going to just give an example. You might want to just comment on what you have heard, actually, and introduce yourself.

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** Yes. To introduce myself, I am a Professor at Imperial College London and I am co-ordinating a project called Blue Green Dream. It is about the way of bringing together spatial planners and all the other infrastructure planners, civil, water and eventually landscape, biodiversity, noise and so on.

**Nicky Gavron AM (Chair):** Can you give us an example of where it really worked?

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** Yes. The example is actually we have done it together with Arup and some other British consultants in Singapore. Where the integrated first residential area has been built and where all these principles of integrated water management and other infrastructure have already been implemented. My plea for this project, this planning process and document is to try to be more proactive, more brave, more engaged, in a sense that all these little pieces which Jeremy [Skinner] has been talking about and that we see the good examples in Christchurch, in Hong Kong and in faraway places and why they cannot happen in London and why London has to lag behind in this. Jeremy [Skinner] has mentioned these fantastic opportunities. I am talking also about fantastic lost opportunities for London in terms of Crossrail, Elephant and Castle and many other infrastructure projects. Where they could have implemented these integrated processes and integrated solutions, which also Michael [Henderson] is speaking about and they simply are not there. They are simply not being implemented.

This planning document is an excellent opportunity to introduce this multi-functionality and the multipurpose solutions in this process. All players, including Jeremy [Skinner], have been talking about the developers and the designers at all different institutions. This is the opportunity to be a bit more pushy and more proactive in that respect. It is not only what the developer can sell - Elephant and Castle cannot sell healthy air, low noise, health and so on - but the city has to be involved in that because this is in the public interest. The future solutions should go for these integrated solutions and interactions, and not only just to talk about them. They have to be built in as part of the process. They have to be modelled, quantified, documented and costed. Whole-life costing has to involve that, regardless of whether they are paid by the developer or the city. It is something which Government or local government or city has to be involved in.

**Nicky Gavron AM (Chair):** Thanks. Yes, that is helpful. Just one final comment on deliverability, the Deliverability Board is being set up now, is it not?

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** In the autumn, yes.

**Nicky Gavron AM (Chair):** We are in the autumn, are we not? It is October, so now. It says in the autumn. Jeremy [Skinner] is not here to talk about that, but I just wonder whether you think it is going to have the teeth it needs and whether it is going to be able to do this. All of you mix with other parts of the sector and so on and with a great range of people. Are you getting the feeling that there is a buzz around this and that people want to collaborate and want to make it happen?

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** It has been mentioned here, just this is very important to me --

**Nicky Gavron AM (Chair):** Not just the Blue Green Dream, all of it.

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** No, it is all of it. In the very initial phase, as the consultation has to involve all these players, not to let them go to get the building permit and then it is too late. In the beginning, when they draft the framework of this solution and before they apply for the permit and before they do even the terms of reference for the tender, this is a very

important consultation process. All these players sit together, they agree on the concept and then it is much easier and it is deliverable. This planning process is an excellent opportunity for the next 50 years. Otherwise, this opportunity will be lost.

**Nicky Gavron AM (Chair):** Jerome, do you have thoughts about that?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** My comment would be that it is happening in London, but the point you made is that it is rather sporadic. There are good examples. This image is one we do not normally see at the Olympic Park, but the Olympic Park flooded in the middle of winter. It flooded nine times last winter and it was very deliberately so. It is a flood retention base and that protects 5,000 homes to the south. If you tried to pay for that as a flood retention piece, you probably would not be able to raise the money at the moment. However, if you pay for it as a park for the provision of a new community and incorporate within it the flood retention capacity, then you deliver something that both Londoners buy, as well as deliver that infrastructure sort of benefit from it.

There are good examples of the way in which things are being delivered very positively in London. I do believe you are right that we could be much more consistent in the way in which those principles can be applied across the piece, but I also believe that it is very difficult to enforce that through planning. Planning plays a very, very strong role, it is about knowledge and it is about advocacy and getting that guidance out there more consistently.

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** You are right. This is an excellent example that it can happen and it should happen all over the place. Specifically, if you are planning for the next 50 years, it has to happen all over not only London, but also other places in the UK. London has a unique opportunity now to be in the driving seat, rather than plugging behind and ten years down the line buying this technology from the Dutch or from whomever else.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I would make a final comment on that. I do think the industry is up for it, I really do think the industry is up for it and there has been a transformation in the industry in the last three or four years, in terms of confidence and its ability to work across disciplines.

**Nicky Gavron AM (Chair):** Across these institutional barriers we are talking about?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** Yes.

**Nicky Gavron AM (Chair):** That is great, that is good. Are there any other final comments on deliverability? Then we will just end on the circular economy.

**Michael Henderson (Associate Director – Sustainability, AECOM):** In terms of us, knowledge is key and at the moment we do not have the London-wide sort of master plan that we have been talking about, to be able to say where benefits can be realised. Where we think about more traditional uses, it occurs across a number of different themes. We need to understand where the benefits and opportunities are and where they can be linked together.

**Nicky Gavron AM (Chair):** Thank you. I have just heard that Noel Farrer [President, Landscape Institute], whom I namechecked, would just like to say something. Do come up for a moment.

**Noel Farrer (President, Landscape Institute):** I just have to start with deliverability and perhaps supporting what Jeremy was saying. Yes, thank you for the opportunity. I am President of the Landscape Institute. I am one of those bodies. I would say there is a big difference between the Olympic Park and

perhaps King's Cross, because the Olympic Park is really truly successful. There are not any swales in King's Cross. I am not knocking King's Cross, it is a great scheme.

I just wanted to say that actually the most important part of that agenda actually is the quality of the thinking and it is something that when you are saying the industry is up for it, it is really true. London has - and it should not be underestimated in the London Plan and in the Infrastructure Plan - such a dynamic group of thinking, creative people in this city like no other. We are designing all of the rest of the world and we certainly should be exemplar in designing our city here. There is something about that potential and therefore I would ask you to be challenging within this plan. On the notion of, "We do not quite know what is going to happen to the green belt in 2025 onwards; we know where we are up until then", I would really suggest that you simply be clear. The reality is that the green belt has some real value, as Michael [Henderson] was saying.

**Nicky Gavron AM (Chair):** The reality? Sorry, I missed that.

**Noel Farrer (President, Landscape Institute):** The reality is that the green belt has real value for this city and Michael [Henderson] was alluding to that in terms of how it could do so much more within the context of it being green belt in terms of recreation, in terms of what it really offers dynamically and in terms of water management, green and blue, for the city, and therefore let it do that. You should be very strong about saying, "No, we are not going to build outside our boundary and we are not going to ever", because I believe critically it is absolutely possible that creatively, we can work within it.

I have sat in the audience. I was doing a scheme in Islington, as Councillor Tom Copley was mentioning earlier. We are putting 70 homes into an existing council estate that is a 1960s housing estate and those 70 homes because of London values - London has this amazing propensity in terms of values - are paying for a £3.5 million landscape improvement across this degraded concrete estate to transform the lives of --

**Nicky Gavron AM (Chair):** Which estate is this?

**Noel Farrer (President, Landscape Institute):** That is Dover Court, just off Southgate Road, to transform the lives of all the residents on that estate. That could be rolled out. It does not have to be *grands projets* like Nine Elms and Elephant and Castle where there are different agendas, perhaps. These are absolutely projects that could really go to deliver the London Plan right the way through, as you were saying earlier, and I would encourage you very much to do that.

Just finally to say that great cities - and London is a great city and needs to remain so - are absolutely about public realm space. You have mentioned it earlier. The quality of all of the environments, whether we are retrofitting them - and dynamically we can, just in the example I have just given you - or all of the new places that we are creating. It is all about desirable places for people to live so that they can have whole life experiences there. This notion that I know the city plan is about it having very much a middle, rather than being abrogated outside, I completely applaud the notion of what we are talking about in terms of the towns beyond the city centre. However this notion that the green belt is a resource and that therefore the city looks outward for those aspects of its resource, but inward in relation to work on density in terms of where we live.

I believe there is a model that can work very, very effectively within what it does, but it is green/blue in terms of green infrastructure (GI) in infrastructure terms, but the social infrastructure that the landscape provides also starts to hint at some of the critical issues in terms of where you can make some money here. The link between landscape and health, you have just touched on it, but it seems to me there is a real opportunity between now and 2050, where you are going to see landscapes that are dealing with healthy lives. That is a vast amount of money saved to the Government. Whether you can turn that into something that you get because you invest in that I do not know, but it seems a real opportunity.

Perhaps the last one also is food and, as Michael [Henderson] said, food is a fantastically interesting topic but, again, the landscape has the dynamics for London to start thinking about growing its food and it should. These are things that are coming and by 2050, with a world population of 9 billion, as projected by then, are critical issues.

**Nicky Gavron AM (Chair):** That is really helpful. Also, I just want to say to people it is a huge issue, but we are going to have a whole session on brownfield and green field --

**Noel Farrer (President, Landscape Institute):** Great.

**Nicky Gavron AM (Chair):** -- because we just could not do justice to it. We cannot begin, you can tell we are scraping the surface in a lot of it, but I am very grateful for the way you have managed to go beyond the surface and come down and brought out some really great nuggets as a panel.

If we can leave it there, Noel, because just in the last few minutes we wanted to go back to the circular economy, which, to be absolutely frank, you can see in the Infrastructure Plan that it has just been kind of added. It sort of sits there rather at the last minute. It is important that we look at it because it is one of the growth industrial sectors for this city. We have the biggest supply of aluminium, plastics, waste paper and so on. We have such resources here. We have an urban forest, we have an urban mine and we have these vast supply chains and we are not stimulating demand or actually co-ordinating the supply. I just want to hand it to Dominic for a minute in terms of the opportunities.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Thank you very much.

**Nicky Gavron AM (Chair):** Also, should we call it the circular economy? It is one of the questions in the consultation document.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Should we call it the circular economy? I always go back to a friend of mine who got chucked out of university. He once said, "If you ever hear of a new book, go and read an old one". Sometimes we do repackage ideas and I am not sure that conceptually there is a great deal that is radically new. With the circular economy, one of the issues is how it gets defined by whoever is using the term. We talk about it as though it some sort of entity that exists out there and that somehow we can grasp this thing called the circular economy. Whereas in reality, if we think about it, there are things that arguably are slightly circular than others and when we have an economy that is circular, will we really know?

My take on what is in the Infrastructure Plan as it stands at the moment, is that the concept has been taken to mean principally the sort of new business models whereby industry is looking to retain the value of the materials and indeed of the workmanship in modules of products. And instead of rebuilding them from scratch, as it were, either repairing them, reusing them or remanufacturing them. That might involve using modules of those products to rebuild them and to thereby retain the value and the workmanship in some of those materials for a longer period of time, to keep them in what I call the cycle of utility, basically. In that way we reduce demand on primary resources and this is the driver in most of the documents around the circular economy. The driver for the private sector supposedly getting much more interested in this is that commodity prices in real terms have shot up since the beginning of the last decade, and supposedly they are going to go up in real terms for the next 30 years as well.

I am an economist and I do not actually necessarily agree with that. We know very little about the future of commodity prices and in fact, over the last three years, those same commodity prices have fallen. What that

says to me is that we should not rely, if we want to drive our economy in a more circular direction, on the presumption that commodity prices are going to go up and up and up into the future as being the prime motor for that change. We are going to have to do some other things to make it happen. The question is what does that mean in terms of the Infrastructure Plan? To me, it is not entirely obvious and the plan is probably right to say that that would be a private sector-driven type of investment. I noted the work that was done by Arup on the cost, because that is the only place you could really go to find out what was being considered as regards what the infrastructure might look like. I was trying to unpick those numbers a little. To be honest, it is not that straightforward, but at least it is fair to say there was an attempt to conceive what that might imply for infrastructure in the future, and various levels of reuse applied to what the circular economy might mean.

On the circular economy, if we really are talking about major electronic equipment manufacturers getting involved in this and taking products back for remanufacture and reassembly, I do not think that is the type of reuse facility that we are conventionally talking about and which the London Waste and Recycling Board has successfully supported in recent years. That infrastructure looks a little different. It is probably a little like the existing factory, but with a separate line alongside it, where the materials are going to get remanufactured and so forth, or it might be that it is re-shored to this country, which is the exciting thing potentially and you have locations for remanufacture of products that are different to the ones from which they have tended to originate.

**Nicky Gavron AM (Chair):** Like?

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Obviously many of our electronic goods are coming from South East Asia and have done for some time and making things --

**Nicky Gavron AM (Chair):** No, you said remanufacturing was something different. Material innovation is what I thought you were talking about. Maybe I have it wrong.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** No, sorry, I did not mean different products, effectively the same type of products. I meant the difference would be in the location.

**Nicky Gavron AM (Chair):** Sorry, I must have missed that.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Yes, sorry. It is difficult to understand exactly what that might look like and it is difficult also to know exactly how you really drive it because, if the driver is the value and the materials, then one is rather reliant upon global commodity prices to do the work for you or indeed for policies that would probably have to be actually at the very least national, but probably beyond national, to drive those changes forward. It is actually, in my personal view, not such a straightforward transformation to envisage.

On the other hand, the other part of the circular economy, if you like, the slightly more conventional one which we are familiar with in our daily lives in our recycling, then clearly there is a very long way that that can go. The distance that can travel over the period out to 2050 is really very interesting to speculate upon indeed, not least because we will have a very different-looking ways. Exactly how different I do not know, but I would like to think that at the very least the way in which the circular economy will work through is in making products more simple to dismantle, and to actually segregate or separate into the various material streams that make them useful back into the economy. How the balance of that plays out is very difficult to anticipate over a period out to 2050.

There are a number of companies who are clearly looking at trying to make their products more circular, but I would say it is a challenge for many of them and it is a challenge particularly in making that work financially.



One of the things that have actually not been very well understood in several of the studies that have been undertaken about this is actually the cost of the reverse logistics. It is going to cost money to get many of these materials back, particularly if, for example, as Apple, you want to remanufacture only iPhones – not phones generally. You do not want necessarily a Samsung, you really want your iPhones back – then you have to get a clean stream back to your remanufacturing location.

**Nicky Gavron AM (Chair):** Yes. I can see that on the whole the examples given were mainly multinational companies, were they not? Yes, multinational.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Yes.

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** Could I add a comment?

**Nicky Gavron AM (Chair):** Sorry, who is speaking? Cedo?

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** Yes. The circular economy in terms of urban planning should be taken a bit broader. It has huge potential and all the discussions tonight about the planning is about circular economy. You have a house. You drink a lot of water. You produce a lot of waste. Water and the hot air, all these can be recycled, and it has to be recycled if you want to have sustainability in your cities. The circular economy has a much broader framework and it is very, very important that this principle – you can call it circular economy or something else, there is a question on it – of replacing this horizontal flow of resources to our properties with a bit more vertical, generating, recycling. It is essential for all future city planning for houses, railway systems, tunnels, substations, energy, anything. It is very, very important and it is a bit broader than just recycling.

**Nicky Gavron AM (Chair):** That is a very helpful comment. Do you think it is synonymous? These terms are used. ‘Closed-loop economy’ is another example of that. Is that not the same thinking, ‘closed-loop economy’ and ‘circular economy’? That is different.

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** You can call it differently, but this is a very important principle which is based on the same philosophy.

**Nicky Gavron AM (Chair):** Yes. We have heard examples of it today during the panel.

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** A few of the examples Jeremy [Skinner] has given.

**Nicky Gavron AM (Chair):** Exactly, so --

**Cedo Maksimovic (Professor of Urban Water Systems, Imperial College London):** This is essentially future planning.

**Nicky Gavron AM (Chair):** When we do our consultation response, we will make these points, but in fact quite a chunk of what is written under circular economy is actually what I would call the secondary materials economy, which is looking at largely what you do with municipal waste. I would like you to address that, Dominic, as your final point.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** There was an earlier question about what is missing in the Infrastructure Plan. It does only talk about municipal waste and construction and commercial

industrial waste in terms of the infrastructure. Therefore the interesting thing there is in terms of, for example, construction and demolition waste, and how that might change. There is a major opportunity to design out a lot of the waste in the first place there also.

In terms of consumer products, where we are relying on people to effectively deliver things back in very clean products, more or less product-specific streams back to manufacturers, the cost of those reverse logistics is not negligible and it is one of the reasons --

**Nicky Gavron AM (Chair):** Even in municipal waste?

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Definitely in municipal waste, yes, so in terms of --

**Nicky Gavron AM (Chair):** What, you mean in separated municipal waste?

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** For recycling, that is easy. OK, in secondary materials markets, we are still dealing with materials in relatively aggregated levels. If you were to look forward at a genuinely circular economy approach and what it might look like, then what you would have is you would have secondary materials markets replicating more what primary commodity markets look like today, with very specific grades of material for clearly defined end uses. At the moment, we have grades that even in the mature recycling markets are relatively broadly defined, and they are not down to the detail of the material that you might want to see in terms of extracting all of the value of the materials that you might to extract, in a sort of circular economy type model. If we are going to do that, you need even tighter separation than we have --

**Nicky Gavron AM (Chair):** Much tighter.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** -- and you are probably looking at things like deposit refund systems for phones and for small electrical items and so on.

**Nicky Gavron AM (Chair):** OK. I do not know. Are there any other comments on aspects of the circular economy?

**Michael Henderson (Associate Director – Sustainability, AECOM):** I would agree very much with Cedo [Maksimovic] in that this applies to a natural circular economy as well, and particularly around the water cycle, but I would urge two cautions. One is one of scale and where it is most effectively applied, and I do not think we necessarily have that sorted out. I do not think it is particularly simply on a house that we can do all things. If you go back to the Olympic Park black water treatment, if we are not making that sort of thing work, where it goes right next to the northern outfall, and have a network already in place and we still cannot join up that circular loop, then we have a problem.

The other element is a lot of the infrastructure is still seen in its silos and we have talked a lot about having a board that looks over it, but actually, improving water efficiency and water quality and all those things takes a lot of energy. Thus you might be getting benefits in one location and you might be losing them elsewhere. That sort of integrated mapping is very important to understand where all the pros and cons are of each different initiative.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Can I say? It is why you have in the plan something that looks almost like a throwaway element around the circular economy and then you have a more

conventional bit around what we need in terms of waste infrastructure. If we were to look genuinely forward in a really radical way, forward to 2050, we would not be seeing waste growing, full stop.

**Nicky Gavron AM (Chair):** No. I tried to make that point, nor would we see incineration grow.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** It is always a difficulty when you are trying to make waste projections of any kind and I mentioned earlier the £1 billion that has been dematerialised in terms of downloads and there are lots of other things happening.

**Nicky Gavron AM (Chair):** Explain 'dematerialised in terms of downloads'.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** There was £1 billion of downloads. What would people otherwise have purchased for their Christmas presents 30 years ago with that money? It would have been things and actually, if you go around waste trucks just after Christmas, you will find that some of the poorest areas are the ones whose bins are fullest, because they are often the ones who are getting presents they often did not really want or that broke really quickly. It is actually just so depressing for all sorts of reasons, social as well as economic and environmental, but there are things going on already that make it really difficult for me to believe that household waste is really increasing and likely to increase. It is a big debate at the moment, but we have projections in the plan up to 2050 with significant increases. OK, what is the purpose of the projection?

**Tom Copley AM:** To make the projection less.

**Michael Henderson (Associate Director – Sustainability, AECOM):** The circular economy relies very heavily on the supply chain and changing the supply chain is going to probably have more of an impact on spatial planning and in turn infrastructure delivery. Take the point that you cannot future project a lot of things because the technology is not there, but the advent of 3D printing and the need not to actually go anywhere to get something is fundamentally going to change the way in which we locate our manufacturers. The move away from large supermarkets to smaller supermarkets and delivery, and having these large out of town delivery hubs, and the way in which they are organised is changing the shape of planning. And the share economy, the advent of Zipcar and the way in which we are sharing resources and space and things like that, is also shaping the way in which places look and in turn will have an impact on the infrastructure. Just to take the circular economy on its own is actually probably a little bit in isolation of those other economic factors.

**Dominic Hogg (Chairman, Eunomia Research & Consulting):** Yes, and believe me, I am a great supporter of all of the principles underpinning where we might go with this. However, the point I suppose I am trying to make is that within the plan document itself, it feels like you have this segmented element around the circular economy, which is almost trying to separate off something that is only about these new business models for high-tech type goods and so forth. Then you have a conventional sort of waste element that feels like, "We are planning for 2050 with exactly the same sort of infrastructure as we have today". There is this sort of disjuncture between the two bits of that plan, one which is sort of daring to speculate a little but not really knowing – for good reason, perhaps – exactly what the infrastructure might look like, and the other on the other hand saying, "Right, OK. We are going to imagine the world in 2050 looking more or less as it is today". The reality is, if you put them together, you would not have as much waste in 2050 as you have in the plan and the so-called infrastructure would not really be waste infrastructure.

**Nicky Gavron AM (Chair):** That is very helpful and it is a good end point. Jerome, I want to just say. Is there anything you would like to add?

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** I wanted to make one last point and it almost relates to the delivery --

**Nicky Gavron AM (Chair):** This will be the last point.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** It is the last point. It almost relates back to this delivery one, but I just wonder whether there is a point to be made about the tone of the whole document in that what we have talked about today is rather visionary and to a great extent there is a sort of vision here. At the moment, the document reads as a sort of ... what is it? An estimate of the infrastructure required for London going forward for growth but, actually, you have the --

**Nicky Gavron AM (Chair):** And the measures to deliver it.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** And the measures to deliver it.

**Nicky Gavron AM (Chair):** Some.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** You have actually almost 8 million Londoners living here who may be looking at this, thinking, "Christ, not another 20 years of construction to build another railway and a sewer and everything else. What is in it for me?" This is a problem that we repeatedly come across and in the advent of social media actually it is getting worse and worse.

I will give you a case in point. I just came back from Germany. Stuttgart 21 is the high-speed rail development going into the centre of Stuttgart. The residents marched against it and voted the local government out and prevented it from happening. Had it been sold as a town centre regeneration, which is desperately needed in the centre of Stuttgart, they would have bought it and they would have absolutely seen this sort of railway adjunct to the town centre redevelopment as a positive benefit.

To a great extent the tone in here does not quite achieve that. If you are going to sell this to the population of London, it needs to demonstrate that there is a benefit to the population of London that comes from it. Not just a benefit to the new population of London that might come in the future, if you like. There are tremendous benefits from what it describes, but they are not necessarily articulated in the strongest fashion in the way in which it is presented. There is a narrative that is required in order for it to be more positively publicly received perhaps.

**Nicky Gavron AM (Chair):** Very interesting.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** It is the biggest single preventer of infrastructure investment moving forward that we are encompassing around the globe at the moment, public opposition to new infrastructure, and that largely comes down to the narrative attached to why we need it and why we are investing in new infrastructure. We do not invest in trains to move people around. We invest in trains for growth, for communication and for trade and that is the benefit that is derived from them.

**Nicky Gavron AM (Chair):** Then you might say you have to engage people more so they feel a bit more ownership.

**Jerome Frost OBE (Leader – UKMEA Planning Practice, Arup):** You do, but as ownership, the majority of people that experience HS2 are not going to be using HS2. They are the people that will be living near the stations and they may never get on the train. Therefore those people have to be engaged in the narrative as to

why HS2 is a good thing, and similarly Crossrail, similarly any of the infrastructure investments I think that are included within here.

**Nicky Gavron AM (Chair):** I know this discussion could go on however we have to close it at this point. What I want to say is, that was another area that we would like to have explored. There are many areas we would like to have explored in more detail, but one of them is new funding, additional, because you have between you mentioned a number of different ways of funding models, but also new business models, new kinds of procurement. It has been touched on, but if you think there are others - because that is where there needs to be more innovative thinking - and if you have examples, we would be really pleased to hear from you because we will add them to our response.

On that note, can I thank you very much, all our contributors, our panel and Tom [Copley], of course? It is very unusual, by the way, that we have meetings this late and I do not think I am going to ever let it happen again. They are usually earlier in the day because it makes it very difficult for people in terms of their later diaries. I just want to thank the audience. We can feel you were very attentive. Thank you all.