

APPLRG / *pteg*: Light Rail and the City Regions

Transcript

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Session 2 – Oil Depletion Analysis Centre / Light Rail UK

Questions 19 - 40

Q19 Paul Rowen: The second section is going looking at peak oil, climate change and health. And, again, same sort of procedure as before. David, would you like to give us a short introduction?

David Strahan: Yes, thank you very much, I'm happy to kick off. Just to clear up - I hope I'm not here under false pretences, I don't know very much about trams, but I hope to be able to give you a thumb-nail sketch on where we are in the peak oil debate, and what that's looking like at the moment and why I think that clearly peak oil is yet another reason to be very interested in expanding tram networks. I'm a freelance journalist, author of a book called 'The Last Oil Shock', which then led to becoming a trustee of ODAC, Oil Depletion Analysis Centre, which is a registered UK charity, basically dedicated to raising awareness of peak oil. First thing really to say is that a couple of years ago this was a really kind of outré and controversial idea, but now it really is not. There's been a huge coming together of the poles in this debate and really we've got a fairly narrow - there are still some outliers as you would expect - but fairly narrow consensus that peak oil will occur some stage within the next ten or so years. You've even got Shell for instance, their modellers saying 'global oil and gas production will come off plateau during the 2020s. Recently, just a week or two ago, the UK Energy Research Council produced a fine report - very rigorous academic study, took them eighteen months - and their conclusions were that peak oil was likely before 2030, and that there was a significant risk that it would happen before 2020. What do we actually mean by peak oil? To be clear about the term, it's clearly not about running out of oil in terms of getting to the bottom of the last barrel on the planet; it's about a fundamental change in trend, the end of growth in the oil supply because of geological constraints, and the onset, eventually, of decline. What's it going to look like? I think we've just found out. We've just had a dry run, in my view, with hundred and forty-seven dollar oil last year and a subsequent collapse in the oil price. There is this sort of persistent myth out there that peak oil is going to mean persistently high oil prices, that oil shortage will mean persistently high oil prices. And I think that's wrong - I think we're going to see extreme volatility, and what we've just seen over the last eighteen months or so is a taste of what's to come. There are a few forecasts out there, for instance Deutsche Bank recently said they're expecting a hundred and seventy-five dollars a barrel by 2016. And there are a clutch of similar forecasts from bottom-up modellers, as they're called, who are just looking at the planned oil capacity investments and what they expect to happen to demand and where they expect prices to go in the next few years. My honest admission is I'm not a forecaster. But really, the crunch that is widely expected in the middle of the next decade, which is often attributed to lack of investment, will actually turn out to be peak oil, more or less. So the IEA, when it talks about a supply crunch in the middle of the decade, Deutsche Bank and others, that will be the real event. So I think that gives us quite a good idea of what it will feel like to start with. Not, I don't think we're going to go into instantaneous decline in the oil supply. I think there's going to be a bumpy plateau, and that is going to cause its own problems. As I say, I think we're going to have these persistent - or, I should say, repeated - spikes in the oil price, which are going to dunk us into recessions I think. The hundred and forty-seven dollar oil was a

very significant factor in our current economic difficulties. We know that oil price spikes are very closely correlated to recessions historically and so that seems to look like a reasonable deduction. So that, I think what it's going to feel like is that we're going to have spikes and collapses in the oil price, along with demand, and that's going to continue for some time. Really what it gives us is yet another very good reason to get off oil as quickly as we can. But the fact that there won't be enough of this stuff and we will discover that repeatedly, and that the way we discover it is essentially through the price mechanism. So every incentive to get off oil as quickly as we can. What would be the appropriate response to that? Not time to go into clearly all of them, but I think one key thing would be to electrify ground transportation, whether that's in the private or the public sectors. Why do I say that? Because, well, electrification has the very great advantage, I think, of being workable. Whereas none of the alternatives, so-called, are. To list them briefly: bio-fuels, not enough land remotely, whichever generation of bio-fuels you're talking about, but we can unpack that a bit if you like; hydrogen, very wasteful of energy and simply a wasteful way of producing electrified transport actually - why not do it directly or through batteries which is massively more efficient? The other reason I think for electrifying ground transport is that it will cut our emissions even on the current grid mix. Just to talk briefly about the private sector - talk about small vehicles, cars for instance - the common misconception, again, that because so much of our electricity comes from coal or gas, that somehow the electric vehicles might actually be more polluting at the moment, than internal combustion engines running on, on petrol or diesel, and that it all depends on our de-carbonising the electricity supply. But actually that's not right because, yes the grid electricity is more carbon intensive per kilowatt-hour than petrol or diesel. But the electric vehicle is so much more efficient, in three, four, five times more efficient (and they haven't really tried very hard yet, in my view, on this) that changes the slant entirely. So if we had enough time, we might all find ourselves running around in electric cars. I suspect we haven't got enough time before this crisis hits to have any, as it were, a kind of smooth and market-driven transition to that. In which case one would hope for a massive investment in Light Rail. And one would assume that the benefits of Light Rail will be that much greater than those of private vehicles because in addition to the cleaning up the emissions instantly, you've got all the benefits of modal shift. And I should say that I mean to finish the climate benefits will become greater over time because the single biggest job that we've got to do is clean up the electricity supply - if we don't do that then we are absolutely nowhere in avoiding catastrophic climate change. So one can presume that electrification of transport generally, and of encouraging trams and trolley buses and so forth as well, will have increasing benefits as time goes on, as the electricity supply gets cleaner. But I'm convinced that it's actually climate beneficial immediately, whether you're talking about the private or the public sector.

James Harkins: Thank you chair. Jim Harkins, chair of Light Rail UK, but I earn a living in the road haulage industry, where it's got an entirely different kind of culture from the passenger transport industry. I got my interest in trams and Light Rail (and I differentiate between the two) from my father, he was a tram driver in Glasgow, in the East End. When I got posted to the then West Germany in the sixties I was very much aware that the operation of the trams was tied in with the regeneration and the rebuilding, especially in areas of decay. It was, and one of the significant things that struck me with the Germans, even as a young lad, they'd gone from a very austere political system, and the fact that they had this movement. And they would tell you it's now democracy. So there's, there's a little bit of my thinking there as well. But what I did notice is the, the change that the tram's done in the Rhine and Ruhr valleys: it made the cities more liveable. Coming forward a bit, I believe that the four ugly sisters - pollution, congestion, peak oil and climate change - they're not going to go away. Sadly our governments, and I say that in plural, because I'm old enough to have lived under a number of governments, they're totally ignoring the benefits of what Light Rail and tram can do. But we've got ourselves in an awful situation here in the United Kingdom that goes back to when Glasgow shut down in 1962, there was a gap and we lost our tramway engineers. And then with the coming of Manchester, well Tyne and Wear first, we then had for street running. At the time they were

talking of putting it through the streets. Excuse me. At the public inquiry there, I raised the issue why, why is the developers paying the then part private utilisation of our utility companies, why are they paying to move it? And the answer was 'it's expedient to get it done because the time, the time constraints and financial constraints window that they had to build it, it was expedient.' Well, again, this leads into, into this, chairman. Basically, because Manchester set the precedent of paying in the moving the utilities has made the cost, and it's culminated in Edinburgh. The last estimates I've heard, you're talking about twenty seven million pounds per kilometre in Princes' Street, because they've got to move utilities. To tackle peak oil using Light Rail, you get a very high modal switch, and it's been recorded as high as thirty, thirty-one per cent, certainly in the Manchester system. But it's, and it's such an obvious way of getting folks out of their cars, to address this. Government, for a number of reasons, a previous speaker has touched on most of them, will not go down that road. I spend a lot of time, because I'm in the fortunate position, going abroad four or five times a year to look at how other folks do it in their cities. And one of the things that's concerned me in the, what used to be the Western Europe and the new Europeans, they invest, the infrastructure investment for post peak oil that's going in, even into industrial areas. They see it as a means of getting their work force to work. My colleague just mentioned that a hundred and seventy five dollars a barrel, when that starts kicking in 2015. Those countries and communities will still be able to function after peak oil. Of course there is the health impact that, I can come back to that in a minute if you like.

Q20 Paul Rowen: Could I start then with you David? In terms of what research you've done, and you talked about what peak oil's likely to look like, but what are the cost implications for that in terms of, you know, we're talking about trams, but if you take the economy and the systems in general?

David Strahan: Well, I think, I can't give you specific numbers, but I think that the impact, broadly speaking the impacts are fairly clear. My view is that we would be in recession now even if we hadn't had the financial crisis - that this is the history of oil price spikes. Almost every recession since the Second World War has been preceded by an oil price spike. You can argue about how causal that is, but it's very closely correlated. A piece of research came out recently about the American economy, which we might use by analogy, obviously the numbers won't be exactly the same. But the analysis showed that the American economy tends to go into recession whenever it spends more than four per cent of its GDP on oil. And at present that stacks up at about eighty dollars a barrel. Now, I think probably for us that number is probably rather higher. We're accustomed to a higher effective oil price because we pay so much tax. And actually changes in, it's not only the absolute level of the oil prices that hurts, it's the speed with which it changes. Because actually it's rather difficult to change your oil consuming behaviour quickly. So therefore spikes are, a sharp spike on a graph is what it looks like, you know it's sharp and it hurts. So I think our tolerance will probably be higher than the American's, but of course we, as a former financial reporter, you know when Wall Street sneezes, London catches a cold. I mean we catch it, we're side swiped by this even if we're not so directly affected by it. So there is a clear correlation between high and, and rapidly rising oil prices and economic pain. And I think, in a sense, that's as much as you need to know. I mean I think if you believe that we are approaching constraints which are pretty unarguable. There is a bit of a head-banging debate going on about, about the exact extent to which the limits are above-ground or below-ground, and I think that's becoming slightly more sophisticatedly viewed these days, as sort of, as symbiotic really. But if you think that the limits that we are approaching are pretty unlikely to be shifted - and certainly the final geological one will be - then we are going to see this repeated pattern, until we substantially reduce our reliance on oil, particularly for transport.

Q21 Paul Rowen: In terms of transport, and if you were going to switch all the transport that you could from diesel to electric, how many wind turbines are we going to need to construct?

David Strahan: I think there are a couple of different estimates I've. Now somebody told me, I read somewhere, I think, that it was about five thousand wind turbines; we've currently got about two thousand wind turbines. That was my own back of the envelope calculation, but I think a slightly more well-founded one, produced by a consultancy, was that we would need something like sixteen per cent more electricity. So, in a sense, to say there's an equivalence between the amount of energy that you consume and the, and the number of wind turbines is possibly a bit misleading because you're presumably going to recharge lots of your battered electric vehicles overnight, when capacity is, when consumption is typically low and there would be higher capacity available. So there's not, I don't think there's a straight line correlation between the additional energy that you require and the additional electricity consumption that, and electricity capacity that you require. So that's not a straight line. And of course the other advantage of this is that actually, in contrast to all the other systems, we already have a distribution system for the energy. The electricity grid is there. It needs to be reinforced, things would need to be done, but basically the system is there. So that's in a sense a great saving.

Paul Rowen: Most of the grid isn't there where you're going to stick your wind turbines.

David Strahan: Well, that has to be done - yes, absolutely - that has to be done, but that has to be done anyway. I mean we are told we're going to have thirty gigawatts by 2020, and I hope we do. I was really talking about a bit further downstream. But the grid connections will need to be built, but that's part of the deal.

Q22 John Attlee: An obvious advantage of electric traction is that you can have regenerative braking, and of course if you've got multiple stops that becomes quite significant. Should we require it? Or are the benefits, and how it affects the economic model, mean that although it's desirable, it wouldn't be sensible to require it? Should we not be thinking about that? We could say 'if you want to have a tram scheme, you must have regenerative braking to make it most efficient.' But actually you could be being too dictatorial. And also it might not make so much difference, and there might be other costs associated with saying 'you've got to have regenerative braking.'

James Harkins: I would say regen braking nowadays should come as standard.

John Attlee: It's standard?

James Harkins: It should come as standard. There are one or two new systems that don't have it, but I would say it goes a long way to balance, balance that cost, especially in peak.

Q23 John Attlee: Okay. Going back to David. We need to clean up the electricity supply to get the maximum carbon reduction. Yes, okay, we can do wind, but it is very controversial. Would you clean it up with nuclear?

David Strahan: I think, I'm sort of reluctant, I suppose a reluctant supporter of another generation of nuclear. I don't think, only a very few people get out of bed in the morning thinking 'yes, we must have more nuclear.'

Tom Harris: I'm one of them.

Q24 John Attlee: But if we don't do that, if we don't go nuclear, how are we going to clean it up?

David Strahan: No, I agree. I think David MacKay, the new scientific adviser, is right: it's going to be a combination of a lot of wind, and it has to be a lot of wind, that's the nearest to market price. You know, there's no getting away from this. Anybody who tells you they don't

want a wind farm in their backyard but says that they like the idea of renewables, is saying 'don't do it for ten years. You know, we'll wait for something else to turn up.' And actually that's what's there. So wind, and I, mind you, on-shore wind is critical. Very handy if we can make it work off-shore. I mean to make all of this work, and I was actually rather pleased to read in the papers the other day that the government is considering finally putting floor under the carbon price. I think that's an absolutely critical factor here. It's the one broad policy that will make most difference. The government seems to struggle with a lot of energy policy, does a lot of micro policy, may say a bit, rather badly. But the one big single thing that could be done to encourage all of this, and that story was reported as support for nuclear, but of course it would be support for both nuclear and wind. I agree, I think that if we, as some insist, close down all our nuclear power stations, it would be another some nine thousand wind turbines you would have to build just to get back to the starting line. So just on a numerical base, I don't think, regardless of what you think about expansion - I would be quite happy to see an expansion of forty per cent - regardless of that bit of debate, if we chop out what we've got already, we really are tying both hands behind our back. And we are woefully behind in terms of building renewable capacity in any event. So, yes.

Q25 Tom Harris: In the briefing paper we got there about ODAC it says 'ODAC argue that transport planning needs to concentrate on modes that reduce reliance on fossil fuels, such as trams.' Is there any tram system in Britain which relies entirely on renewable energy?

David Strahan: I don't know, and my argument would be that it doesn't matter if it does or not. I don't know that, but by analogy, the remarks I was making about electric cars, I can only assume are even truer about trams. That's to say that the impact is to reduce emissions even on the current grid mix.

Q26 Tom Harris: There seems to be a distinction that's being drawn here between pollution at point of use, and this seems to be the great attraction of tram system - that it doesn't create pollution as you get on the tram. But to me that is a double-edged sword because the pollution is still being created a hundred miles away at a coal powered power station; I'm not quite sure I see the difference. I mean even an electric car that's plugged in overnight is drawing its energy almost certainly from carbon-based fuel.

David Strahan: Indeed. If you want to hear in detail about this, the person to hear from is a chap called Gary Kendall, who's a director of a consultancy called Sustainability. He's a former Shell chemist who bailed out of Shell after ten years, couldn't bear it any more, and went to work for the World Wildlife Fund, produced a report on electric vehicles, on precisely these issues, this whole issue of what's called the long tail-pipe problem. And I was talking to him about this yesterday. If I can take the electric car as, as analogy, if you take your little electric car to Australia, and plug it in and charge it up - and Australia is overwhelmingly coal fired electricity, it's almost a hundred per cent over there - you would still produce less emissions than if you, than the same car fuelled with diesel.

Tom Harris: Because of efficiency.

David Strahan: Because of the efficiency. So if that is true of private vehicles, like for like private vehicles, when you add the other benefits of trams - the energy efficiency, the people moving efficiency and the modal shift and all that - I can only assume this, but it makes complete sense to me that that would be a cleaner and more climate beneficial thing to do than to do something else. I mean, as I say, as the electricity supply gets cleaner, the benefits will increase. But I can only assume that they are immediate reductions in emissions by installing, by running trams even on current grid mix.

Q27 Tom Harris: In terms of security of supply - and correct me if I'm wrong here because

generally this is not an area I know a great deal about - my understanding is that, for example, wind power generated electricity cannot be stored, has to be used as it's generated. Does that not create a major stumbling block in terms of security of supply for a transport system?

David Strahan: It's the big technical issue which has to be dealt, but I don't think that there are any deal-breakers here. There are two ways of addressing that: one is that you spread your sources of renewable energy very, very widely - create a super grid, so-called, which means building not only wind turbines but a high, an HVDC, high voltage direct current cables connecting us much more to the continent. And if you find your wind is coming at times from Morocco, and at times from the North Sea, and at times from, you're getting hydro from Norway, the aggregation of all that variability has been shown and demonstrated by big computer models, will even itself out very much. So that you would, you'd get yourself much closer to what you would call a dispatchable, reliable supply. The other way of doing it of course is, the other given in the energy debate at the moment is that when you turn the light on, the service is provided instantaneously: that demand is king and that supply must meet it at all times. I think super-grid idea is a great idea, it's a vast one, it is going to take some time to build, even when there is the political will to do it. Rather easier to tackle the so-called smart-grid end of the debate, which is about shifting demand in ways, when you can. For instance turning your, instead of turning your washing machine on and expecting the thing to work instantaneously, you say the effect of pressing your intelligent button on is to say 'I want my clothes clean by the morning,' and the combination of the smart-grid, the price of electricity or the signals coming from the utilities tell the appliances when, effectively there is a lot of wind power, because the price will fall or the signal will be sent out that there are surplus renewable power at that point, and that's when the preponderance of the appliances work. It could be that, that electric vehicles form a big part of that - okay, there's a big additional draw, but it's also something that you have some control over when it happens. So those two things combined, the two broad approaches that and I think the smart-grid, the demand approach will be more likely to transpire sooner than the super-grid approach. But be aware that when people talk about Denmark getting, for instance, twenty per cent of their electricity from wind: this is done with a lot of dumping of their electricity over the border into Germany, and return trade as well. Spain has got very high penetrations recently, this year has, at times, got some forty per cent of its energy, of its electricity from wind, on particularly windy days. It's backed up with gas, which is easy to fire up and fire down in response to the variations of the wind. So, there are ways of accommodating much, much higher concentrations and penetrations of, of renewables than we currently have.

Q28 Tom Harris: I have to say I admire your optimism that you'll persuade any politician to come up with an energy policy which told their constituents that if they wanted to turn on the television to watch Coronation Street, they would have to set the Sky Box to record it at some point between then and the morning.

David Strahan: I don't think that's what's suggested; I think it's the fridges, it's the washing machines.

Tom Harris: Fridges?

David Strahan: Yes, fridges. Well, fridges, I mean actually I don't know if you perhaps saw this yesterday, Indesit has just done a deal with a thing called RL, RL Technology, which is a very, very clever bit of technology which just - it's simple but it's clever - which detects when the frequency of the grid dips below fifty hertz. And that tells you that the grid is struggling to provide sufficient energy. So what happens is your intelligent fridge says 'am I cold enough? Oh yes, I am. I'll switch off.' And because your fridge and your freezer is not powered up for large periods of the day - it doesn't need to be because it's insulated and a small amount of intelligence is written into the circuitry of these things, so that whenever the grid can't provide

enough power, fridges turn off. And there is actually also some rather clever algorithms in there to, to make sure they don't all switch off at the same time, because if they did there would be a problematic fall in demand. So what this can do is shave peak loading, as called, this kind of approach has actually been able to avoid the construction of coal fire power stations, for instance in Florida and other parts of the world. Very simple technology, actually even simpler than the one I was just talking about. So it's not necessarily about denying people the ability to do what they want to do, when they want to do it; it's the ability to shift the load when it's not necessary to happen at peak time. I mean a facile example - well, quite serious one really I suppose - in Florida they have what's called ripple control. So there's a little ping that goes down the electricity supply at four o'clock. People who have signed up for a particular tariff, their swimming-pool heaters turn off, because that's the peak - you know, four to five o'clock is, is peak demand - their swimming pool heaters turn off. Why they need them in Florida I don't know, but anyway, that's what happens. And they have a, a slightly discounted rate for the electricity by agreeing to do that. And then at six o'clock, five o'clock they turn back on again. This is all desperately simple stuff - very, very simple stuff - but it does require to be extended, you know, rolled out in a fairly sort of rigorous and comprehensive way.

Q29 Clive Betts: Let's come back then to trams. In terms of, don't know if mentioned before, it's not just about the sort of energy that we're going to get to power the trams, but can we make the trams more efficient? Because the general assumption is trams are efficient, they're green, they're cleaner - that's it, we've done it. Are there further improvements and developments that are worth looking at to make sure they're even better advantage?

James Harkins: Yes, there is. In answer to Mr Harris's question: is there any UK systems... Metrolink last year done a deal for a lot of green energy to power the trams. Merseytravel have got some wind generators feeding into Merseyrail. Karlsruhe, they've gone down a different road from wind generation, and I think it's a sensible way, they've gone for photo-voltaic or solar panels. Basically what they've done there is they've taken most of the municipal buildings, and looked at them, and put photo-voltaics on the roof. And you can actually go on the site and the evidence is actually provided. And that will produce somewhere between forty and sixty per cent of the electricity needed to run the tramway system, even on a day like this. The technology for trams, it's well known as, as being very, very efficient. It can use local power generation, so it can go round the political problems as such, and having to record Coronation Street at a different time, of the super-grids. It's also, because you can use local power generation, what it does is, it takes away the pollution at the point of use - but with the smaller local schemes it's easier to put scrubbers, if there's burning fossil fuel, on one generator than on several thousand cars. So it increases the, the climate control in the area and the ambience of the city.

Q30 Clive Betts: Just a thought in terms of the design of the trams themselves, I mean there are a whole range of different sorts of vehicles around, and I wonder how much thought is given there to energy use. I mean some of the trams you see are almost like trains on tram tracks; they're very heavy vehicles, and surely they can't be nearly as energy efficient as a much lighter vehicle. Is much thought given to all that?

James Harkins: Well, I'm in agreement with you there Mr Betts because, as I was saying earlier, we've handed over the Light Rail industry to the heavy rail engineers, and they've taken us down the road where we're building, as somebody mentioned, train-sets in the street. I think maybe we want to re-discover some of the first generation values and use the technology which is still in service, which is low cost and affordable, and is very efficient, which is still being used on the European mainland.

Q31 Clive Betts: Are there any particular examples there that you'd like to draw our attention to?

James Harkins: Yes, there is. A fortnight ago we went over to Spain and Portugal, and we looked at where they've gone down the road of, say, starter lines, where they've just got a small, short section which is affordable, as opposed to the enormously expensive systems we've got now, and have been building on it. Kassel is a very good example, where they had the advantage, they still had the urban tram system. Over a period of time they've extended it using low-cost, affordable - what we call low-cost and affordable, but in actual fact has been traditional tramway practice, as opposed to heavy rail. So they've increased that incrementally. And that includes the tram train, which, wearing the hat of Parliamentary Light Rail Group, I took a party of MPs over - think it was last year or year before - to Kassel to actually look at it. So yes, the technology is there, and the low-cost, efficient technology is there. Just here in the UK we seem to be mesmerised by bells, whistles and flutes. And the promoting authorities, they've almost got the town hall syndrome of the last generation: 'mine's is going to be bigger and better than yours.' But in actual fact if they come back to basics they become much more affordable.

Q32 Paul Rowen: Can I ask you about health? Because you put some figures in here Jim. About the health consequences of pollution and congestion. You quote quite a lot of figures for people with asthma, and deaths through related diseases, but if you were to, what, in terms of impact, for putting a tram system in? What is the reduction in terms of pollution on the streets?

James Harkins: Quite considerable, Mr Chairman. The British Thoracic Society, the report which I refer to, came out in 1998, and they talked about hundred and, hundred and forty-five thousand folks, young and old, dying of respiratory illness, which is a greater number than heart disease. Depending which government figures, and it's extremely difficult to work your way through the labyrinth, between twenty-five and forty per cent of those figures are down to tailpipe emissions. You asked the previous speaker, has anybody spoken with the government on this? I took a number of people there, including Mr Willsher, on the NATA refresh consultation. It was quite clear the Department for Transport were not taking into account the cost to the nation; they were not, not having joined up thinking. The figures you see there, we calculate by, by accepting the fact that a tram is a generational thing, and not just a, a ten, fifteen year, but a generational thing.

Q33 Paul Rowen: Well, how can you prove that? I mean in Cairo it's quite simple, I was hearing on the radio yesterday, you know, they're getting this black smog descending now, and will be for the next few months, because all the farmers are burning off their rice you know where it's come from. I can look outside there now, I can't see any visible pollution. So how do I know that that's the result of the car? People are dying because of the cars whizzing round Westminster?

James Harkins: Because cleverer people than ourselves have done the studies, and it's there. It's akin to the clean air act that came out in 1956. We could see the pollution then because, just like they're burning the rice that was coming out the lungs or out the chimneys, and you could see it. The Clean Air Act came along and changed it so you couldn't burn bituminous coal. It cleaned the air up. Since then, because of the increase of the internal combustion engine in the streets, it's almost an invisible pollution, but it's still there and it has been measured. In fact, I believe the government will be getting prosecuted under the world health legislation for having dirty air quality in our streets. So it is, it is there.

Q34 Tom Harris: Can I just ask supplementary to this, because I think we're in danger of getting in the same debate that we got into when the House of Commons decided to impose a smoking ban based on figures that related to the ill-effects of secondary smoking. Figures which even now are disputed, and nobody can actually say hand-on-heart exactly what the health consequences of secondary smoking actually are. You give these very, very specific

figures of the people who suffer, I think from asthma, is that what...?

James Harkins: Yes, respiratory illness.

Q35 Tom Harris: Right. That's been peer reviewed, has it? I mean that's a definite, agreed figure, you know, as accurate as we can be, taking everything into account, that that is a very specific figure of people who are suffering as a result of car emissions? And there's no doubt over those figures?

James Harkins: There's no doubt, no doubt at all. It's just that the variation in the scale used in the NHS figures, it varies between twenty-five and forty per cent of the hundred and forty-three thousand folks who have died in the British Thoracic report. Lancaster University recently came out with another paper, pointing out, basically confirming it. And only in The Times coming down today there's been a report coming from California, indicates that the PM10s coming out of the diesel engine results in a high number of miscarriage. So the evidence is there.

Q36 Tom Harris: Oh no, I mean I'm not suggesting that, that car emissions are good for you, or don't cause any health problems. What I'm questioning is the analysis and the methodology that leads us to sometimes suspiciously round figures about the number of people who suffer from respiratory illness as a result of car emissions. And I sometimes wonder, I never see the same figure quoted by different sources, it's always different figures from different sources. My suspicion is there's an absence of a real robustness in the methodology used to calculate these basically hypothetical figures. You know, if you're asking government to spend millions, possibly billions of pounds on a particular scheme, and that we should take the health consequence into account. Now, there was an earlier discussion, this was part of the earlier discussion about the Treasury taking into account dis-benefits of people getting out of cars. That's a specific calculation that we can make because we know how much petrol costs, we know how much it costs to run a car, and we can get a very accurate picture on that. On health as benefits, all I'm saying is I think we should be quite cautious about the various organisations, all of whom, I guarantee, will come up with widely different figures for the number of people who suffer respiratory problems as a result of current car usage.

James Harkins: Well, going on the British Thoracic Society, it was a closed report, but being the kind of guy that I am I was able to acquire a copy of it. Speaking with the senior medics on it, they consider that it's quite a conservative figure. They've been able to drill down...

Tom Harris: Does conservative mean inaccurate?

James Harkins: No, I'm not going there, Tom. I would say they're being, using minimalist numbers. The feeling that I got, it was a greater number than actually was in the report. But they've been able to calculate the costings for the number of beds, operations, morbidity and the whole cost to the nation. This is excluding the cost for...

Q37 Tom Harris: I don't deny that they have. All I'm saying is that's one organisation has made that calculation. You know, get another organisation to do the same calculation, I bet you find a very significantly different figure, that's all I'm saying. It's very difficult to come up with an accurate number. So I don't want to prolong it, chair, I just think it's, the point I'm trying to make is that sometimes when these particular benefits to this kind of tram system is concerned, I just think we have to regard the predictions for the health benefits with some caution, because I don't think there is a generally agreed methodology for putting a specific and accurate figure on the number of lives saved or the number of people who will not suffer those respiratory illnesses. I think by definition it's incredibly difficult to come up with hard and fast figures, that's all I'm saying.

James Harkins: I would agree it's difficult to come up with hard figures; however, looking at other reports of a similar nature, they're coming along with generally broad-brush similar results.

Q38 Paul Rowen: Accepting what you're saying Jim, and we want to come forward with some recommendations, and I want to try and tie the two aspects together. If we were to say to the government the appraisal system needs to take account both of climate change, taking peak oil as part of reducing carbon emissions, cost of oil, etc. And the increased ill effects of pollution, what sort of model would either of you be able to suggest or to point to where those two issues, the climate change agenda and the health agenda could have some basis, accepting what Tom says, in some form of appraisal that can be used? Do you want to start first David?

David Strahan: I'm not sure I quite understand the question. A model to give an economic value to ...

Q39 Paul Rowen: Well, yes. Normally when a scheme is put forward and assessed, there is an appraisal mechanism that's used and that takes account of a number of factors. We heard earlier on the effect, the fact the department are trying, the Treasury is going to lose fuel duties is one of the factors that's taken into account as a dis-benefit. Now obviously with the climate change agenda, we were talking about reducing the CO2 emissions, we've got targets as a nation, transport's got to contribute to that target. There ought to be a means by which any system that's put in can measure its carbon emissions compared to accepting there's a modal switch, that's one method and equally taking on board what Jim said, if there is a health cost to car pollution and again, by putting a tram system in there's a modal switch, therefore there are fewer cars on the road, therefore there's fewer pollution, how do we try and factor something like that into an appraisal mechanism that will stand up?

David Strahan: Well it seems like a very large and complicated job to me. I mean I can't point to you to anybody who's done this but, I mean, presumably the transport planners would be able to estimate, I mean this is going to rely on, presumably, on a combination of estimates and trying to calculate the carbon and fuel saving benefits ...

Q40 Paul Rowen: I'm sure they know, the Department of Transport must know the, you know, the amounts of CO2, we get it on our cars now, don't we? We're banded according to our CO2 emissions.

David Strahan: Yes, no, I mean, all those numbers, somebody must be able to do them, you know, if not the Tyndall Centre, then somebody appropriate must be able to do that study, I just can't point you that anybody who will just pull that out of their back pocket. I suspect it would have to be created from scratch.

James Harkins: On that one Mr Chairman, in my evidence, if you have a look at page twenty-six there's the Oslo report where they looked at the rubber wheeled vehicles and they've done a breakdown of the exhaust from the combustion engine but also the asphalt wear, tire wear, break wear and the grinding of the larger particles already torn from the road surfaces. This breaks it down to again point, two point five which on a windless day will hover up to about between six and ten feet, which if that's built into an equation as requested, I would say, I would say that we go for steel on steel electric trucks, certainly in a central area.

Paul Rowen: Thank you and thanks very much for your time, appreciate that, very interesting.

ENDS