

**Note: this transcript has been produced verbatim and includes all the quirks and idiosyncrasies of the speakers.**

**Dallas**

Hello and welcome to episode seven of the KTN Geo4Earth Podcast Series. I'm Dallas Campbell, one of your presenters, I'm a science and technology television presenter.

**Suzie**

And I'm Suzie Imber, a space physicist, we'll be with you throughout this series, chatting with some of the finest minds with all topics related to climate change.

**Dallas**

Okay, right in this episode we have got Paul Campion from TRL.

**Suzie**

And Andreas Zachariah, TravelAi. And this is episode seven. We're chatting about how we can best green the transport sector, and what role geospatial data plays in this.

**Dallas**

Hope you enjoyed the series. Hope it gives you lots of food for thought lots of things to think about, hope it's getting your brain fizzing. Enjoy this episode. I'm so excited about this conversation. We've got two really, really, really, three times, interesting guests on today.

**Suzie**

Yeah, we've got Paul Campion from TRL and Zac from TravelAi. So I guess the first thing we'll ask them to do is just introduce themselves and find out a little bit about them and their background. Why don't we start with Paul?

**Paul**

Well, hello, thank you. I'm Paul Campion, I'm the CEO of TRL. It turns out that not everyone's heard of TRL.

**Dallas**

Who are TRL? You guys have been going forever and I've never heard of you.

## **Paul**

Not quite forever but it was the day after forever that we got started. We've been going eighty nine years. And look, part of the thing is the name changed a couple of times, it started as the Government's Road Research Laboratory in 1933. I think the Road Research Laboratory 1933 always sounds a bit like a Busby Berkeley movie to me. Anyway, it's always been focused on the future and there's a lot of interesting history to talk about that, but I don't really want to.

The claim to fame, which I most enjoy is the fact that TRL invented the zebra crossing, because before someone told me that, I suppose I thought the zebra crossings had crawled from a swamp with gills, or been handed down on a mountain on some tablets, it never occurred to me someone actually invented it. But it's quite, as well as being a sort of a fun thing, actually, I think it's quite revealing and interesting about the way that transport becomes just a totally, taken for granted part of our lives.

I'm sure we'll come back to this in the conversation because that conscious deliberate thought which said, how can we help pedestrians to stop getting sacrificed to the motor car which was done in the 1950s actually. It is a perfect example of the incremental but at the same time, actually quite radical invention that we continually need to do, to meet the challenges of decarbonisation, levelling up any other things that you can think of that we need to do.

## **Dallas**

I'm just amazed that in the 1930s, they were thinking about things like zebra crossings, were they that many cars?

## **Paul**

Well, actually zebra crossings were 1950s, but in the 1930s, they were thinking about really fundamental things, like how do you design roads? The UK has got one of the safest road systems in the UK. And that isn't actually because UK drivers are sort of fundamentally better or indeed, perhaps as we like to think, more polite or more respectful than other countries, actually not the truth. It's because our roads are designed better and the environment that people find themselves in, the signage, the literal layout of the road, how tight corners are, how things merge into that, these have really, really deep important impacts on our ability to use them safely. That's the sort of thinking that TRL was doing in the 1930s of course, the world has moved on a lot, but we still care about the same problems. We approach them differently.

## **Dallas**

Sorry, we're gonna have to do a whole other podcast just on roads because you know the thing that I don't understand, just really quickly, is when they were originally designing road layouts, whose idea was it to say, okay, you've got cars coming in opposite directions, these sort of two tonne automobiles, bits of metal coming towards each other at sort of 50 miles an hour, I know what will separate them, a white line.

## **Paul**

Well, of course, originally someone had to invent the white line and worse than that, when motorways were being deployed for the first time in the UK, you know, the famous Preston bypass in the 1960s, very late 50s 60s. There was no central barriers, so never mind 50 miles an hour, cars were approaching each other at 70 miles an hour, closing speed of 140 miles an hour. Actually, it's worse than that. When motorways were first introduced, there was no speed limit. Now the cars didn't go as fast as they do today. But it's literally true that you could drive as fast as your car would go and there would be someone driving as fast as their car could go and there would be nothing physical separating you at all in those days.

So what they learned and so what we call, what we casually call crash barriers, which are more properly called vehicle restraint, is the technical term, is all about making sure that on a motorway, you can't hit someone else coming at 140, you could conceivably hit them going at 70, which is honestly bad enough, but not 140. That's exactly the sort of innovation that has saved countless lives, motorways, of course, absolutely the safest roads you can drive on and one of the ways is because the safety is engineered in.

## **Dallas**

Wow. My dad always had a good safety idea for cars, sorry, I'm gonna go off on a tangent, prevent me from going off on tangents. He always said, basically, what you want to do is on the steering wheel, you want to weld on a big metal spike and then that way, everyone will be really careful how they drive.

## **Paul**

We're going to spend a whole podcast on the history of transport if you're not careful, because actually in the 1960s, there was a guy called Ralph Nader in the US.

## **Dallas**

Yeah, Ralph Nader, he's the politician guy. Yeah, didn't he invent the seatbelt?

## **Paul**

He did and he [unintelligible] because essentially, you didn't need to weld one on, that's how a steering column worked. Because the cheap way to engineering steering column is a piece of metal that goes from the roundy thing, you know, to a cog, when you hit something, that piece of metal would tend to go straight through you. So you can engineer it to be safer, you know, you have it in two sections, which is how it is now, right? But you don't need to put a spike on. Once upon a time that's literally and exactly how it was, you were driving in front of a big spike and if you hit something that spike would have an effect. So again, you know, the engineering that goes into the safety has taken decades and decades and decades and decades.

**Suzie**

Oh, it's so fascinating. Interesting to hear about the history and how much the design has changed over the years and how much consideration and thought has been put into it. But yeah, today we're going to focus on what's happening now and what we're looking forward to and I guess it's a good chance now to have a chat with Zac and find out a bit about his history and interest.

**Zac**

Hello, and good afternoon. So yes, I'm I'm Zac, I'm CEO and Co-Founder of TravelAi and EV Serious and we are potentially future looking, or forward looking because we're in the business of using technology and generating data to solve, address problems around transport. I lead a beautiful team of engineers and problem solvers. And yeah, we've been at this strange intersection of trying to make it more sustainable, make it better understood, and present a sort of bottom up view of the world. Yes, I am the son of a stewardess and a pilot but prior to that I was a prop trader in banking, and my heart and soul are in engineer.

**Suzie**

Oh, so data is your thing. Tell me a bit about the kind of transport that you were looking at. Is it me and my car? Is it me on a bus? Is it a mixture of public and private?

**Zac**

I think the best way to describe it, is to be able to tell the story of you and pretty much anyone else. So to be agnostic about whether it was public or private, whether it was a car or a bike, if you're walking, it's just a case of trying to tell that story from kind of holistic perspective and to be agnostic about whether it's in London, or whether it's in another part of the world. Because yeah, these days we have that freedom to move around as we please.

**Dallas**

Great. Well listen, thank you so much for joining us, both of you are concerned with transformation and the great problem is how do we make transport greener, more efficient, more integrated? So perhaps this is a question to both of you? Can you just sort of give us a brief overview of the state of the problem if you like, who are the worst offenders? Which bit of the transport sectors need radical overhaul?

**Paul**

You want us to name names?

**Dallas**

I want name, names.

## **Paul**

Let's start at the top. Okay. No surprise to anyone that we have got a climate crisis on our hands, it's man-made, it's to do with emissions. And I'm sure most people know that transport as a sector, is the single largest emitting sector. So you know, there you go. There's a mandate for change, right there. I actually think there's an equally important, though potentially less existential challenge, which today in the UK is called levelling up. But you know, this isn't unique to the UK and we could use lots of different phrases for it, but [unintelligible] the problem of inequality. Transport inequality is holding a lot of people back, therefore holding us back as the societies and economy and I think those two forcing functions, decarbonisation and levelling up mean we've got a non negotiable deadline to get stuff done. Now the good news is and this maybe is where I, you know, we collaborate with Zac and Zac's taking the lead, is that at the same time, we have opportunity, we have enablers, particularly from technology. My background is from IT, data, digitalization. Like Zac, I'm sure we both have a common view that digitalization is a critical component of the toolkit that we got to solve this stuff. So the good news is we've got tools that we can work with, even though the challenge in front of us looks pretty astronomical.

## **Suzie**

Yeah, interesting. Zac, what do you want to sort of add on on the topic of the challenges and the need to transform the sector?

## **Zac**

Well, I think the mobility and the opportunities it affords anyone in society cannot be underestimated. So it's how easy can someone get to that job opportunity? How accessible is it? How much effort is getting to that school, the school with a better stats? What happens when you have an area around the city where because the transport is bad, the house prices are lower? So one of the things that struck me as very interesting, living in London for the last few decades, is what happened when the overground became a sort of pseudo South and North Circular and bits started to connect up and there were pockets of London, that until then were out of reach of public transit.

But creating those connection points, creating more accessibility opportunities in terms of paths that you could take to get inwards, then opened up those areas. Also the other way of thinking is, where there is privilege, in terms of the kind of access that you get, what it can do is it can take the pressure off that and what I mean by pressure is the people who want to go there, the people who create that real pressure. So it's a very neat equalising force at a much larger scale, when you look at house prices, as much as it is an enabler about you know, offering you or presenting you with more opportunities.

## **Dallas**

That's very clear how how transport affects inequality. But how does that then link up to environmental issues as well?

## **Zac**

I think at first blush, I would say because the change in the environment, air pollution, all of these things affect all of us. It's not really possible that, okay, yes, there are pockets where you can say it's localise, you know, pollution tends to be higher around city spaces. But in real terms, we're all impacted by it, and the benefits of decarbonizing the benefits of going greener. Also, in essence, decarbonizing transport will almost without question be primarily driven by electrification. You know, that's the other great thing. So there are a lot of gains that many people can be impacted by, and that they can enjoy, because it's easy to also forget air pollution. You know, they say that in London alone, the numbers could be as high as something like 20,000 people a year are very seriously impacted by the air quality.

## **Paul**

So Zack, I'm not quite going to disagree with you. But I'm going to sharpen maybe some of those points, because I think there's quite a lot of evidence that the impacts, you mentioned pollution, the impacts of pollution, the impacts of climate change, bear down particularly hard on the less advantaged. So I think these two things actually align. And if we just solve decarbonisation, particularly if we said the answer is just electric vehicles, then we will make inequality worse, not better. We know that electric vehicles at the moment, that's not going to change overnight, are just more expensive than internal combustion engine vehicles. That means the faster we force electrification of the fleet, the more burdens we're imposing on the less well off and by the way, electric vehicles create a tonne of nano particulates anyway, there's brake dust, tyre dust.

So we all think of diesel as being the big issue, which it is a big issue, but it's by no means the only one. So, you know, I think, yes, we will all bear the impacts of climate change. But you know, you don't have to think too hard to recognise of the seven billion people on the planet, there's a billion or two billion who are really, you know, who are going to literally die or have their life chances dramatically changed by climate change over the next few decades. Whereas the likes of us, the global 1% we're gonna have to make some adjustments. Maybe life isn't going to be quite as pleasant as we thought it was going to be, but we'll be okay. So, there's that fundamental inequality, I think lines up across these two dimensions.

## **Zac**

I mean, just to follow up when I talk about electrification, that's not just exclusive to road transport. Because when you look at the table for electrification and to the railways around Europe, you would find that the UK would be ranked number 26, in terms of its electrification of its railways. The type of diesel that is used in the rail space is pretty damn ugly. So you, you take that into account and then you also look at, for instance, I don't think many people realise that the percentage of the Indian railway network that is electrified, is higher than the percentage of the UK railway network. That's a pretty astounding fact for the nation that one could say birthed the steam railways. When I was talking about cities and urban environments, yes, we know, because you tend to find disadvantaged communities primarily in greater

concentration, in cities. So electrification and EVs are not the silver bullet, there is a much larger opportunity around electrifying all of transport. And, you know, the way we look at public transit, especially, because if you look at the unit of energy, when you're converting it into kinetic energy, and the efficiency gains that you have with for instance, electrification, those could be potentially savings that you then pass on in the public transit sphere to the public transit user. Just on the final thing, with the particulates, typically newer EVs have regenerative braking, the regenerative braking mechanism doesn't have brake discs, it's a closed system, so you don't get particulates. It's older EVs that still use an ice style disc brake, which then creates the particulates. But in real terms, yeah, regenerative braking doesn't generate particulates.

## Paul

That's true and we shouldn't argue over detail, there's still [unintelligible] there's no zero. But look, there's a huge amount of truth in what you say Zac. Do you mind if I just expand the lens just slightly here though, because it's very easy, in debates about transport to do two things, first of all, to think about personal mobility. Then, by the way, to think about getting to work, as sort of being the thing, but the largest category of trips in the UK is actually leisure outings, not going to work at all. There are several segments of transport use for personal mobility that are more important than commuting to work. But actually more fundamentally than that, if we ignore freight, then we're ignoring the bit that's growing.

So over two or three decades, there's been a trend towards people making fewer trips, personal mobility on a per person level has been declined, the population has been growing, but your people are making fewer trips. We can imagine why that might be. It might be the ability to do meetings like this, it might be the ability to do internet shopping and all sorts of reasons why personal trips might have been declining, freight is going up. Because if I do that internet shopping it's still got to move around on or near to the Earth's surface to get to me.

So if we think about the problem as not just being [unintelligible] then then we get a fuller picture. Transport professionals are very fond of saying, well transport is a derived demand, an economist phrase, meaning that no one travels for the sake of it. First order approximation anyway, right? You don't travel just for the hell of it, you travel, to go and see your mum, to get your kids to school, to go shopping, to go to work, to go to the cinema, to go to the pub or go and see a mate, whatever it is you're travelling for a reason. And, of course, that's true. But we could take it even one step further back, because the travel choices that I make, and the freight demand that I create, because of the purchases I make and the clothes I wear everything you buy has got what, 10% of its value is embedded transport. These are constrained by the society we live in, by the built environment. You know, I live where I live, my work is where my work is, my children's school is where my children's school is, my shops are where my shops are. There's actually quite a limited ability I've got, once I've put myself in that network to dramatically shift my travel behaviour either direct or induced.

On the margin, I can do some things, I can do some things, clearly I can buy an electric vehicle, clearly I can cycle instead of take the bus, you know, there's some things I can do on the margin. But fundamentally, those choices are built in to the city

or the town or the place I live and so we have a really long time cycle that we have to think about, as well as the short term choices that we often focus on. So I'm sorry if that's actually sort of exploded the conversation too big to be useful.

**Dallas**

Not at all.

**Paul**

But it's incredibly important context I think.

**Dallas**

That's a really good context. It's a good point, actually to talk about solutions and particularly, you know, Paul, you talked about how technology can free us from some of these problems.

**Suzie**

Yeah, I was going to ask Zac, actually a little bit about how geospatial data underpins the transport network? Because you have a company that specialises in analysing data around movements. I think Paul thrown open the door to us, to have a much broader conversation. I'm just interested in the data side of things from you, Zac.

**Zac**

Yeah. So, for instance, let's take a little example. Sometimes you see adverts on television, if you see an advert for a cosmetic product on television, but one of the things I find quite amazing is there'll be in very small print, it'll say, okay, this is a survey of 57 people. And you know, they will have spent hundreds of thousands, if not millions on their advertising campaign, and they'll have tiny sample sizes. One of the extraordinary things that amazed me when I came into the transport space, and I started to see how data is collected and who has it, is that something as foundational as the national travel survey or in other countries, it's called the household survey.

The sample sizes are very precise, they are designed to get a cross section of groups in different parts of the country, across a 52 week period. But if you take 8000 household surveys or up to 10,000, for the DFT, and you take them across 52 weeks, and all the different regions, what you actually end up with are weak samples, that are actually quite small and really what's much more interesting, surely, especially in somewhere like the UK, where our temperature varies much more, is to tell the story of the individual across seasonalities, across weather temperatures, across weather situations, across different modes, because the other thing was something like a household survey, or travel survey is it's the user puts the data into a survey. So it's very different to when you kind of autonomously put it in.

But of course, then there are other sources, like you look at something like the Oyster card system, and it has an incredible view of all of its Oyster card users



tapping into the tube and the bus. Paradoxically, of course, it can't really know when you get into a car and you drive around, even though in London, the ANPR, which is the Automatic Number Plate Recognition system, will pick you up and try and track you and if you're speeding, send you a ticket or if you've gone into the wrong zone and you haven't paid for it, remind you that you need to pay. So it's a system that then sits within its own silo.

To some degree, what also surprised me was the discovery that even within the UK, a different train operators view of their own customers is siloed, it is incomplete. If you are a major Train Operator servicing lines into London, once your traveller arrives into central London into TfL's fiefdom, you no longer see them, you no longer get to find out anything about how they use the system. And so that is even more extraordinary in a world where you're using paper based season card.

So you know, to use an analogy, you go to Las Vegas, and the favourite customer of any casino is the whale and the whale turns up and they get the get the players sweet and everything because they're more likely to put money into the casino. Well, a season ticket holder is a whale for the transport space, there are very few services that you or I buy, where we will pay 12 months upfront for that service, we're now accustomed to paying on a monthly rolling basis and you know, it might be one month in advance, but 12 months in advance.

So it's an extraordinary privilege in some sense, or how the system works, that it has this, but it's also a strange dichotomy or paradox, that they then have so little about these customers. And what or how we might travel on the weekend, what other forms of transport we use to get point to point, these end up being mysteries. Again, that strikes when it has been a missed opportunity, because I think part of the solution of a greener and more decarbonized transport system is one, not where we turn up and figure out how we get, the system has been designed how it wants, but it's a system that's much more sympathetic, it takes a joined up view and understands what may have happened before or after.

So for instance, thanks to working with European Space Agency, I spent almost two years living in Holland and so there on an annual basis, they put together the train timetable understanding the flow between different stations, to the point where there are certain stations which they know or interchanges, they will make sure that a train where they know people are getting off at this station, and more likely to switch to another train, to go to another destination, they run them on the other platforms next to each other. So people just walk a few metres. And they even allow the driver the discretion to hold back his train a few minutes in case the other one is running late.

And that's just an extraordinary joined up way of thinking of the world when you're planning something like the train system in the Netherlands, you know, notwithstanding how wonderful it is to be a cyclist there as well.

## **Suzie**

What you're describing sounds so logical.

## **Dallas**

I'm a London cyclist and it's a hellscape.

**Paul**

So what Zac said actually, that's actually an example of the 10 pound voucher you get if you are a participant in the national travel survey.

**Dallas**

Paul's holding something up to the camera.

**Paul**

Yeah, it's a 10 pound voucher. So I've been paid for my data to enter the national travel survey. There you go.

**Dallas**

I'll tell you what I'd like to do, I just want to pause for a second here. So basically, you know, the upshot is we now have a lot of data, which means we can plan better, we can be much more joined up in our thinking, how does that then convert to being more green?

**Paul**

Actually, I think if we answer your question, we can make a huge amount of progress, I think there's a different question we can ask which potentially unlocks even more. Think of it this way, since the Big Bang, until roughly last Thursday, no one knew where anything was or where we wanted to go to and our entire transport, our cities, our lives, everything, everything had been designed on the basis that you don't know where stuff is. We've invented technology on the ways to make up for that. So a timetable and a bus stop are pieces of technology that enabled you to coincide in time and place with a means to transport. But you have to do that, you have to arrange to be at this place, at this time, because you don't know where stuff is.

Now, because of the technology that we now have, the fact that we've all instrumented ourselves, we're all carrying around mobile phones, everything that moves now is essentially GPS tracked, connected to the network, for the first time in the universe's history we know where where stuff is and a lot of it, we know where it's going. I mean, my diary on my mobile phone tells me where I'm going to be for the next few weeks, right, that's available. So people know, could know, what journeys I'm going to make, the supply chains, we know stuff. What we haven't yet done is rethink the design of cities, our society, everything else to reflect that new reality, because it has only happened last Thursday, maybe the day before. But it's intensely recent and it enables us to rethink things from the bottom up.

So the examples that gave are fantastic examples of making the current system better. I'm more ambitious, I want, I want a new system.

## **Dallas**

We've got a bit of a catch up problem then, as technology gets better and better, the way that we design, the way that we manufacture things has to catch up. Paul, we were talking about how much we hate airport design just before we started recording. Is something like this going to affect things like the way that we build airports and make them less horrific?

## **Paul**

Well again, the airport is based on the assumption that even though we know the names of the people who are going to be on the flight and where they're going to, you've got no ability to predict what's going to be where. So the fundamental design point behind any piece of transport is you designed for peak demand. Right? Why are we designing for peak demand instead of being able to predict now what the demand will be and designing for the actual demand? Let me take a different example. Let's take the road system, the road system is designed for peak demand, it used to be it isn't anymore since the pandemic but it used to be the nine o'clock Monday morning rush. Okay, and if that was congested, you would create a spreadsheet that said if I can save everyone 10 minutes time, then it's unjustified in spending a billion pounds on building a new road. That's basically what we used to do.

But actually, why can't we use our knowledge of what needs to go where and our knowledge of psychology, build economic technical systems to incent people, reward people, help people, advise people to use the thing differently rather than building new roads. We could actually begin to think about how to use the 25% of the road capacity, it's just completely idle and I mean the road capacity between midnight and 6am. No one uses it, completely unused, all that capital sitting there unused. Why are lorries clogging up the M1 at 10 o'clock on a Monday morning, when 25% of the road network is not used?

That's a way of rethinking the system. And actually, to do that we need exactly the sort of technology that Zac's using. But we can use it to ameliorate what we got, or we can use it to build a fresh. I think the challenges are so big, that we should welcome the opportunity to think super big, and really think about, how do we want to live? How do we help people to have flourishing lives? How do we help sort inequality? We've got a completely new toolkit in front of us, let's stop reaching for the old solutions,

## **Suzie**

That sounds fascinating to think about the way that we even change people's behaviour. Zac I want to talk a little bit with you about data. Because I know that you take data from a whole tonne of different sources to try and address some of these issues, can you tell us a bit more about where your data comes from, and how you're using it to change the future of the transport system?

## Zac

So actually, the only source we take our data from is right down from the smartphone centre of an individual and that then becomes kind of almost the source of truth or the the origin of the breadcrumbs from which we then try and rebuild or try and figure out how was that they moved around through time and space. And the opportunity there is then to take an agnostic view of whether they took public transit or private travel or whether they walked or if it was motorised, and try and get that joined up view of them trying to navigate getting from from A to B.

One of the reasons why we kind of insulated ourselves from other data sources is so that you, you can do more around the spectrum of privacy. So for instance, it is our premise from the very beginning that when we generate this data, and we've been approached many times by people in the location based services space, so specifically advertising, that we will not and do not want to ever, we practically find it insulting as a team, for this data to work its way into that space. Because to look at the transport animal, the problem, the opportunity, the beauty of this incredibly important system, is to see that it is better and there's more value in using the data very narrowly to solve the problems around the transport space. Because if you can have that feedback loop and you can show the user how you're solving a problem with their data, and you're not abusing it, you're not selling it to someone else, then that's a proper value proposition.

And that for us is kind of the strange thing, because of course, today, it's the tech companies, you know, they've carved up their universe, they've almost exhausted tech services and so what they're now doing is they're looking at other verticals. And those verticals are health, finance and mobility and the people who know the most about how we use mobility systems are first Google, head and shoulders, then you would say, second, Apple, and then you might have a an arm wrestle between the likes of Amazon or Facebook. I'd probably put Facebook above, really, and they are picking off data points from the apps that we use and the services that we use. The value for them is if you look at someone like Google, and they're running Waymo, which is an autonomous vehicle service, which has been built up over years, when they decide to launch Waymo, they will know which city to launch it and where will be most successful and serve a need greatest because they understand the need of the customer.

And that from our point of view, as someone or as a group of people who enjoy technology and data, has for us been the hardest bit of the translation, or the education equation when interacting with the transport space, which is that you can and you should get closer to your customer. In doing so you will solve their need and you will build up a relationship that moves from being a hostage situation to one that is a genuine, you know, provider and customer situation. So right now, yeah, the people who have the most data are the ones who are perhaps thinking how it is that they can enter the space and it's a shame that the people who are actually providing the services, and who could do the most with it, and make the biggest impact and who are ultimately closest to the customer are probably missing that.

**Dallas**

Brilliant! I knew this was going to happen. We're already over time. This is the problem when you've got really interesting guests, we should get less interesting guests on.

**Paul**

We've only just started!

**Dallas**

I know that's the annoying thing.

**Paul**

Switch the recorders off, we've got a lot more to discuss here.

I know, we could just go on and on about this. Suzie, finish your point then and then what I'm going to do is Paul, think about this question. I want you to think about 10 years in the future, what the transport system is going to look like very briefly? But Suzie finish your point first.

**Suzie**

I just wanted to ask Zac a little bit more about kind of where his company then sits. We've got these big data company that are collecting lots of data about us. We've got the people that we interact with that don't have access to the data. Zac, are you somewhere in between the two taking the big data, translating it into data products that some of the the other companies can use, like Transport for London or the road designers? Where do you sit in this space?

**Zac**

Well, what we're trying to be is a an advocate, a friend from the tech universe, who actually wants to work with the providers for the express purpose of creating a virtuous circle where this data can feed into a better service. When that's potentially optimised. Maybe it's cheaper to run, maybe it's made more efficient, maybe you can even reduced the costs. But you know, I think at the same time, almost to segue to Dallas' question, which is what does 10 years begin to look like? Well, I think you'll have a larger component of things being delivered by demand responsive services, that can start to deal with almost like okay, what's a what's a core or fundamental level of service? And things that need to happen and then like a variation margin, especially where I always feel like rural areas tend to be forgotten because if we look at something like the bus network, bus timetabling, it's pretty [unintelligible].

Yeah, I know, I couldn't agree more, I live in a very rural place.

**Dallas**

This is Suzie's big gripe in life. You're living the dream though, Suzie. I live in central London, which is hyperconnected. All I want to do is get out.

**Suzie**

I live in the Peak District. So it's a different world. But let's go over to Paul.

**Dallas**

Yes. Okay. This is final point from Paul, 10 years tell us our utopian travel future?

**Paul**

Well look, 10 years is 2032, which is two years after the deadline or a whole bunch of deadlines. We're gonna stop selling a bunch of obsolete technologies, aren't we? We're gonna have a much bigger proportion of decarbonized power trains and vehicles around the place, in one way it's gonna look quite different, be a lot more shiny vehicles. In other ways of course, the road outside my house or indeed the houses you're speaking from, is going to be the same road. Right? These much bigger changes in how we plan society, how we help people, is going to take a long time to unfold.

So I'm, I'm a techno optimist in the sense that I think the things that Zac's doing, the things that we're doing, the things other companies are doing, will provide a whole new set of opportunities. I'm a political realist, in the sense that a lot of the barriers that Zac's talking about, all of the barriers that we see day in and day out are not technical barriers, we have the technology to do much better things than we do at the moment. It's like Zac's example of why don't we schedule the trains to come in on platforms next to each other? The answer is nothing to do with technology, nothing to do with planning, it's to do with incentives, it's to do with economics, it's to do with political priorities, it's to do with the way we organise society, that stuff isn't going to change a lot over 10 years, I'm afraid.

But as a technical community, as a technology community, I think we can help to accelerate that and the way we do that is by helping to tell better stories. We're dreadful in the technology industry and the transport industry for using jargon. We don't talk about trains and buses and things we talk about modes. So the jargon is terrible, terrible, terrible and we allow people to say, you know what we need is road user charging, I'm sorry, that's dead in the water. Just listen to the name. No one's ever gonna buy that thing. We need to tell better stories and politicians are the storytellers, they're the people we licence in our society to tell stories about better worlds.

We, as a transport technology community, I think, can over the next 10 years get a lot more skilful, by helping those people to tell better stories, to break down the real barriers, which are not technology or behavioural, they are economic, they are political, they are commercial, it's that gritty stuff.

**Dallas**

Good stuff. I think that's a good place to end. Talking my language Paul. Thank you very much indeed and thank you very much to Zac. Okay, that's it for this episode. Hope you enjoyed the discussion as much as we did. That was excellent. Thank you very, very much to Paul and to Zac, for taking part. Thank you, most of all for listening. We look forward to your company next time.

**Suzie**

Don't forget you can get in touch with Luca Budello or Andy Bennett at KTN if you'd like to collaborate with them on any of the topics we've been talking about today, and of course, as always, the link to the publication Meeting Net Zero and the Power of Place, which goes alongside this podcast series can be found in the podcast description. See you next time.