



## Introduction:

who we are,  
what MetService and NZTA do,  
our respective backgrounds,  
roles in the sprint and perspective that we brought

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# The Challenge

To reduce deaths and serious injuries on the Desert Road, where ice is a contributing factor.



So this was the challenge we were facing, to reduce deaths and serious injuries on the desert road, where ice was a contributing factor. On the first day of the design sprint, our sponsor added three words to the end of this statement: "...by winter 2017."

And without going too much into the results, what I can say is that this problem statement is one of the single most influential factors that made this design sprint a success.

It is simple, it is clear and it is time bound. It gave our team constraints where they needed them, the freedom to explore possibilities and created the urgency needed to galvanise the team and focus their energies.

But first, the road itself.



The Desert road is part of the State Highway network, and in this case, a key part of SH1, which in some aspects is very much the “spine” of our nation’s roading network.

The Desert road starts at Rangipo in the north and ends in Waiouru in the south.

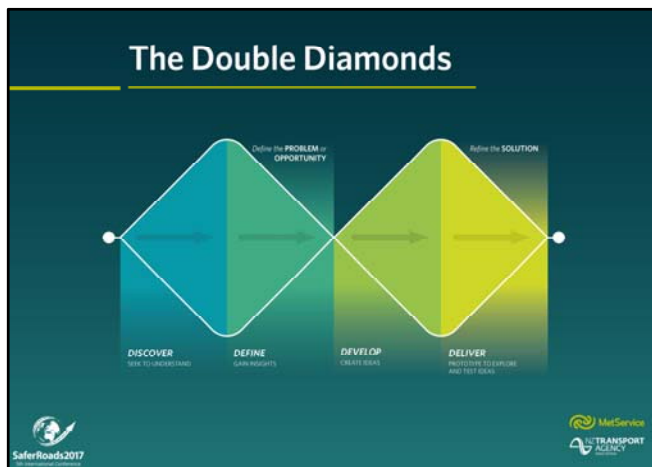
It is used by tourists, heavy freight vehicles and residents of central plateau and during winter is a key route for accessing the central plateau’s ski fields.

As I said, the road is a key arterial route for heavy freight vehicles and so when the road is blocked, it’s a significant disruption to the country’s productivity

It’s elevated and situated in the middle of some extreme terrain – it is hot and barren during summer, and cold and barren during winter. The terrain is forbidding, some of the corners you’re doing less than 25 km/hour and exposure to the sun is variable as well. Long straights exposed to the sun can quickly turn into winding corners with banks casting shadow over the roads even when the sun is at its highest.

During winter the road can be closed due to ice and snow – that might happen four times a year and unfortunately, every winter there are a number of crashes, injuries and also very regrettably, deaths on this particular stretch of road.

In terms of numbers; there is one death a year on the desert road which is one too many, even if it’s not a huge number, but the worrying trend for us is that the number of serious and minor injuries continues to climb and in that respect, 2015 was the worst year in recent times: 6 serious injuries in 2015 and 10 injuries of a more minor nature – so that was what sparked the challenge for us – how do we reduce this instances of these deaths and serious injuries occurring?



A different approach: we wanted to tackle traditional problem with a creative/innovative approach.

Over the last three years we had been building our capability in this relatively new methodology called Service Design and Design thinking. I had started my career at NZTA running a team of Business Analysts and very early on was asked to set up a new team which would complement our business analysis capability but would very much focus on the customer – this is how we came to create the Service Design team at NZTA.

Service Design looks at products and services, or meaty, chunky problems and helps you re-examine them from a very customer centric perspective. And in that respect, Business Analysis and Service Design work very well together – the BA looking at change from a business process perspective, and the SD looking at that same change from a customer perspective – and together, they create great value for us in how we deliver change at the Transport Agency.

So what I have up on the screen is something that any good SD will recognise and live by – the double diamonds. The double diamonds are best described as a set of principles, or a roadmap, or blueprint for how design thinking is approached generally.

#### Quick explanation

The kind of principles a Service Designer would operate by are principles like being very customer focussed – so testing assumptions about what would work for a customer, by going out and actually engaging with customers,

iterating – so developing a prototype fast, testing it and refining it quickly to flush out the good features from the bad and to turn around a solution quickly, so that you can realise your benefits quickly or learn from your challenges quickly.

Looking at the problem we wanted to solve, we settled on a particular method of combining all these traits and proposed to run a Design sprint.

# What even is a Design Sprint?



So what even is a Design sprint?

A design sprint is an intensive and immersive process of understanding a problem, creating ideas to solve that problem and testing and refining those ideas with customers in order to come up with a working prototype or proof of concept.

The emphasis is on two things: the first is that the team drives ceaselessly towards a working prototype and the second is that it is heavily based on being customer driven.

So we created two key expectations right off the bat to ensure we kept ourselves true to the principles of the design sprint.

First; an expectation that at the end of the five days we would be demonstrating the prototype/concept to our respective Chief Executives and “pitching” to them the ideas we came up with. So right from the get go, we have to drive the team towards this expectation that they’re creating something. That the concept they’re delivering is new and exciting and innovative and by the way, you’re pitching to your CEOs at the end of this.

And the second is that it’s heavily driven by the customer.



## Customer Driven



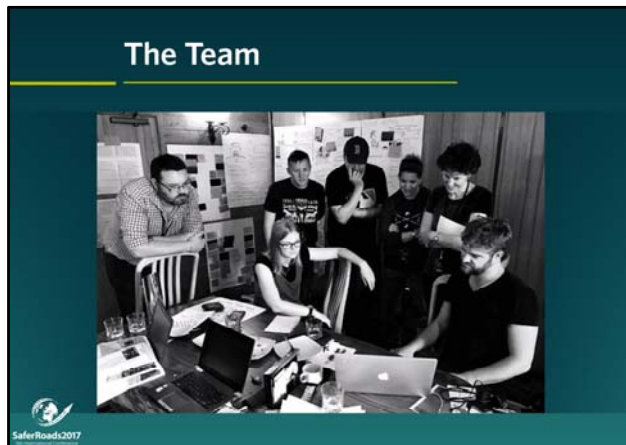
And that meant, we needed to hold the design sprint up in the Desert road

We needed to go where the customers were going to be. The people using this solution are up there driving through the desert road, they're living near the desert road and it's where the experts in this problem are – the highway patrol, the Army at waionaru and our contractors Downers who manage the road for us.

So we based ourselves in Ohakune. That meant we could take the design team to meet with the local highway patrol, the Waionaru army fire corps, who act as first responders for any incidents on the Desert road, and our local contractor Downer's who maintain the road on our behalf. These guys live around and work on the desert road day in and day out so getting their perspective was crucial and we would never have gained the insight we needed to develop a concept like this for users of the Desert road if we had done this from a boardroom in Wellington.

Also, being up there meant we were able to drive the Desert road itself and see the conditions first hand, we spoke to people in Ohakune who were saying different things about the desert road than the people in Waionaru were saying, we busted several myths about the Desert Road because we went and saw the people that worked on it day in and day out. It could not have been done the way we did it, without us being there and seeing it for ourselves.





And the selection of the team is critical. It's really important when running a design sprint to get people who are open to different ways of working, or who have really flexible mindsets. We wanted people that would be able to handle the pressure, move quickly, self organise and work well as part of a team. One of the things we've learned from running these in the past is that this is not a process where you want to take someone along in the hopes that they will possibly open up their mind to new approaches. It's a hard enough process for people who are already pretty open minded, and so every member of the team needs to be on the same page and in the same mindset for it to be a success.

Given we were doing this as a joint MetService and NZTA sprint , we worked carefully with MetService to give them an idea of the kind of people we needed and to work with them to give them an understanding of the kind of pressure their people would be under – because it is a fairly high pressure situation and thankfully they gave us two of the best we could asked for. Thier perspectives, skill sets and attitude really added value and in quite critical parts of the process too.

We also had two NZTA staff members involved who brought an immense amount of value to the process and we asked one of our vendors Heyday (a digital consultancy) to participate in the process because we wanted them to understand the nature of the problem domain from the beginning and not to second guess the customer need when it came to designing a prototype.

In that respect, the team make up was as near as perfect as you could get it. Yes, we had times where people were questioning the process or going waaaaaay out of scope in what they wanted to achieve, but this was coming from a place of excitement and enthusiasm, so they were “positive” problems to deal with. On reflection, we had a fantastic team and I can't thank them enough for the energy and effort they put in to the week.

Finally, the whole process was organised and facilitated by myself and another Designer from the Transport Agency and it was our role to guide the design team through the process and ensure that the overall outcome was achieved.



And so without giving away too much of what the team actually came up with, this is the rough overview of what we did throughout those five days.

### **Monday – Opening and Travel**

- Message from our sponsors (MetService & NZ Transport Agency)
- Team building / Getting to know each other
- Reviewing and agreeing problem statement
- Travel to Ohakune + Driving the Desert Road (4.5 hours)

### **Tuesday – The Voice of Experience**

- Met with NZ Army Fire Corps, Highway Patrol, Downers (Desert Road contractors)
- Spoke to the locals
- Themed insights from all interviews and conversations – this is where we busted some myths....
- Started ideation process – How are we going to solve this problem?

### **Wednesday – “Crunch” Day**

- Ideating
- Storyboarding
- Deciding on a solution
- Testing with the sponsor

### **Thursday – The Voice of the Customer**

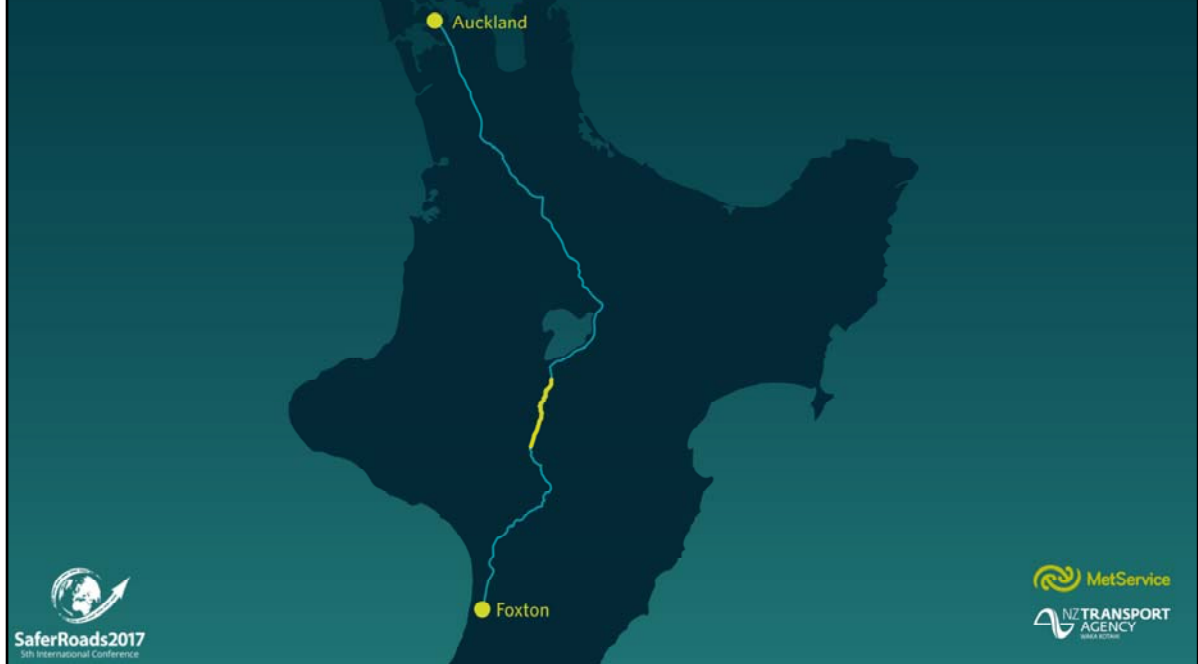
- User-testing
- Prototyping – Low & medium fidelity
- Refining
- Building

### **Friday – Develop the Pitch and Travel home**

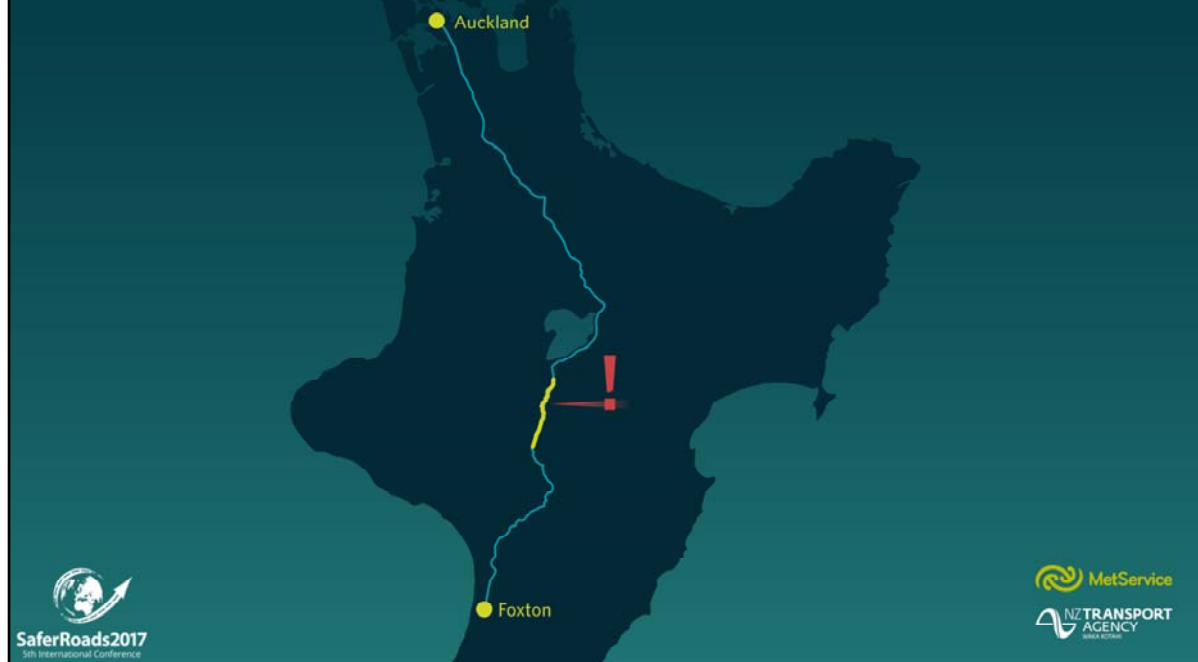
- Final round of user-testing
- Developing “the pitch”
- Drive back to Wellington

The trickiest part for Dan and I as facilitators was to balance leading vs facilitating. There were times where we had to lead the team and push and cajole them through the process and there were times where it was critical for us to step back and let the team make their own decisions about direction or the insight they got of an interview – we didn’t want to watch them go down the wrong path and end up not delivering, but we also couldn’t disempower them and take away the ownership in the design they had come up with.

# Scott's Story



# Scott's Story



# How do we change the story?

## DUSTIN

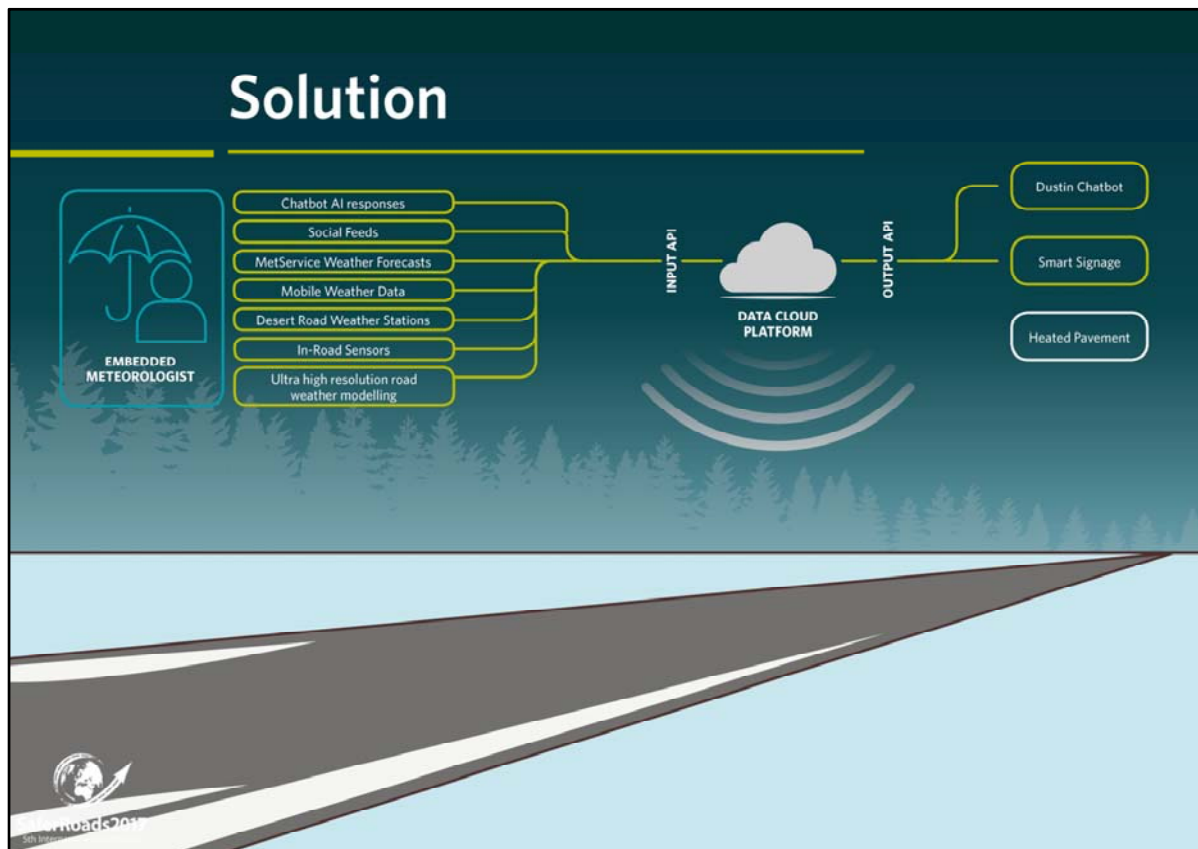


- Preparation
- Precaution
- Prevention
- Connecting people with data

So finally we come to the concept/prototype itself which we named our Dustin; and stands for Desert road User Sensory Travel Information Network.

Dustin approaches the problem from a Safe system perspective, which means we try and address the problem from as many perspectives as possible, and from each perspective we reduce the risk of death or serious injury so that we're not relying just on one aspect of the system to avoid a crash, or we're not just assuming that drivers won't make a mistake, because we're human and we all know that people make mistakes.

The key aspects of our solution are to address it through preparation, precaution and prevention. And all of it is driven by smart, real time data.



And Dustin really is driven and underpinned by a cloud platform that hosts live, real time data to help customers make smart, informed decisions.

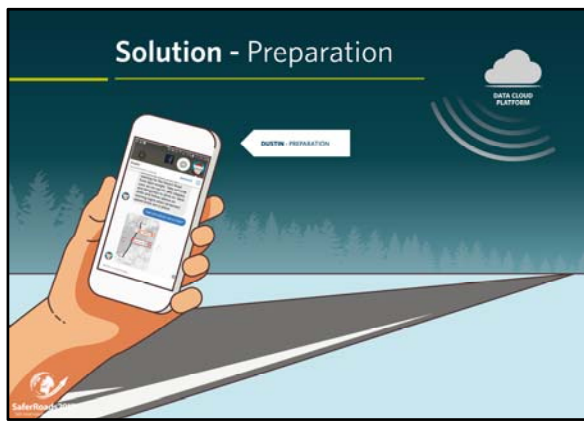
The cloud platform collects data from the MetService forecasts, from sensors on the trucks of our roading contractors and from a system of weather stations along the Desert Road itself. It collates this data into the cloud and then drives a number of different channels.

Finally, the concept calls for a MetService forecaster to be embedded within the Transport Agency assisting with interpretation of the data, providing spot forecasts, and liaising with our roading contractors on the ground.

So what kind of data and information are we talking about?

Peter talks through the MetService weather data.





One of the most exciting parts of our solution concept is the artificial chat bot which acts as the visible face of Dustin. Dustin is a smart little chat bot that you can ask about the Desert Road and through the combination of real time data and a bit of smart programming, can actually have a conversation with you about the Desert road and the weather conditions on the road itself.

For example; you can ask Dustin about the Desert road generally, you can ask him what you can ask him about, you can ask what the forecast is like for the Desert road next week, tomorrow, and what the conditions are like today and you can ask him if there is any ice on the road.

Additionally, he can provide you with a map showing the areas where ice has been detected, and if you're not so sure about travelling the Desert road, he can provide you with an alternate route which hooks straight into Google maps.

There are a couple of great things about this aspect of the solution: The concept of the chatbot means that we're not asking customers to download something bespoke or that has limited wider application. Dustin resides within the channels our customers already interact with – Facebook messenger, twitter, Slackchat and so we're able to use the surrounding eco-systems that come with those channels to advertise and raise awareness of Dustin (for example, facebook boosted adverts)

Also, Dustin is only limited by the data we provide him and how well we choose to configure him for his conversations.

If you can identify the variables, you can configure the chatbot to have a conversation about it. For example; ordering pizza – there are only so many bases, sauces and toppings in the menu, and the process of creating a pizza can be configured in a pretty linear way – ie: let's start with the base, now what type of sauce etc.... The same applies for Dustin. We identify the variables; weather conditions, temperatures, today, tomorrow, next week, and we can configure the chatbot to respond to provide the customer with the information they're after.

He can speak in 17 different languages and if he doesn't recognise what you're talking about, he gives you an option to hand off to a real person.



The second aspect of our solution concept is the dynamic signage.

And there are two types of signage:

Dynamic signage that is situated at the start and end of the Desert road to inform people of the condition ahead.

The signage is large billboard sized and contains feeds from CCTV along the highway, and can show where on the Desert road ice has been detected or where there is a risk of ice forming on the road. This signage is placed at the start and end so as to give customers a place to pull over and see it and to also change their route if they don't like what they see up ahead.

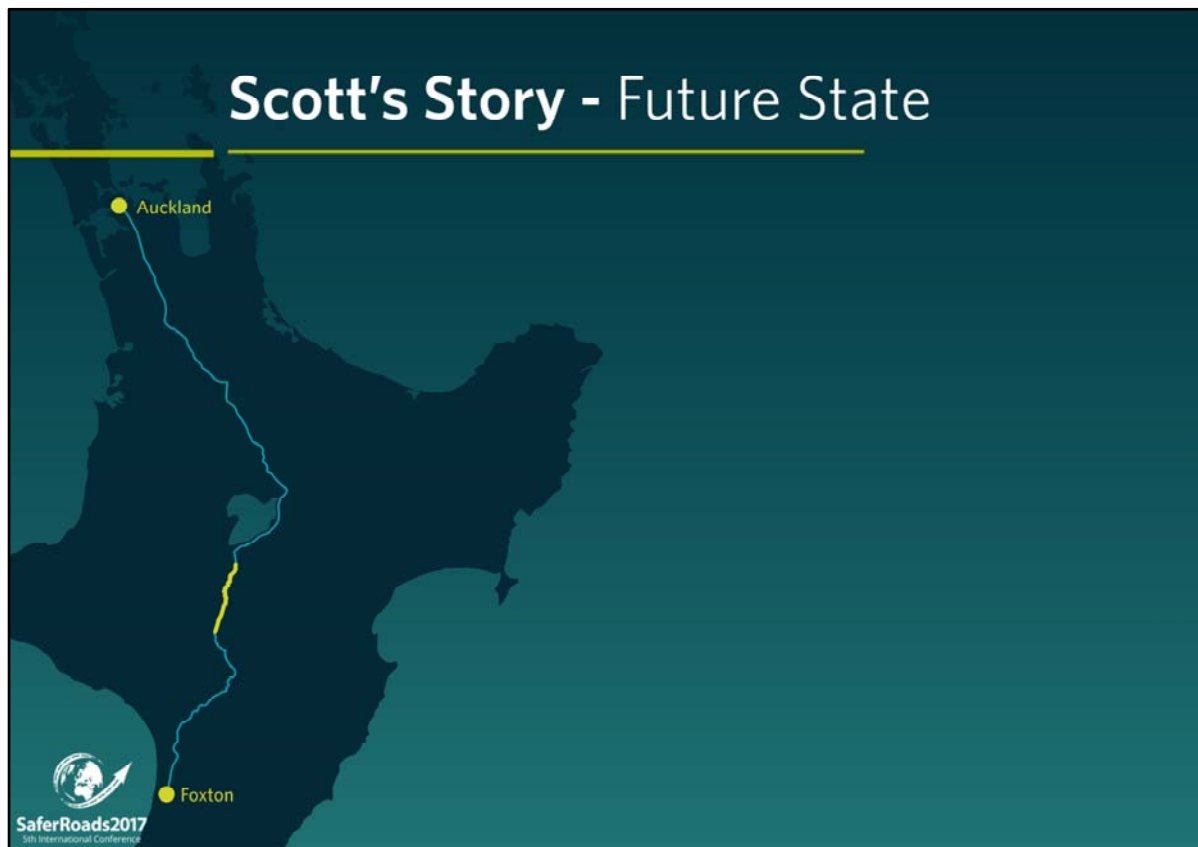
The second set of signage is variable speed signage, where the speed is automatically reduced when ice is detected on the road and again is digital, so that it stands out more for customers, can be operated remotely if needed, and will use emoji type indicators to encourage people to keep to the appropriate speed limit.



Finally, we are going to trial heated pavement at the riskiest spots of the desert road so we can actually prevent ice from forming at all.

There are a couple of ways we can do this – by implanting metal coils in the pavement, which acts in a similar way to the back windsheild of your car – it heats up the pavement by heating the metal coils and therefore ice doesn't form.

Or a really innovative method is to actually shave carbon and metal filings into the asphalt itself, as you lay it, making the road ever so slightly conductive to electricity, and this slight conductivity allows you to heat the road just enough that again, ice can't form.

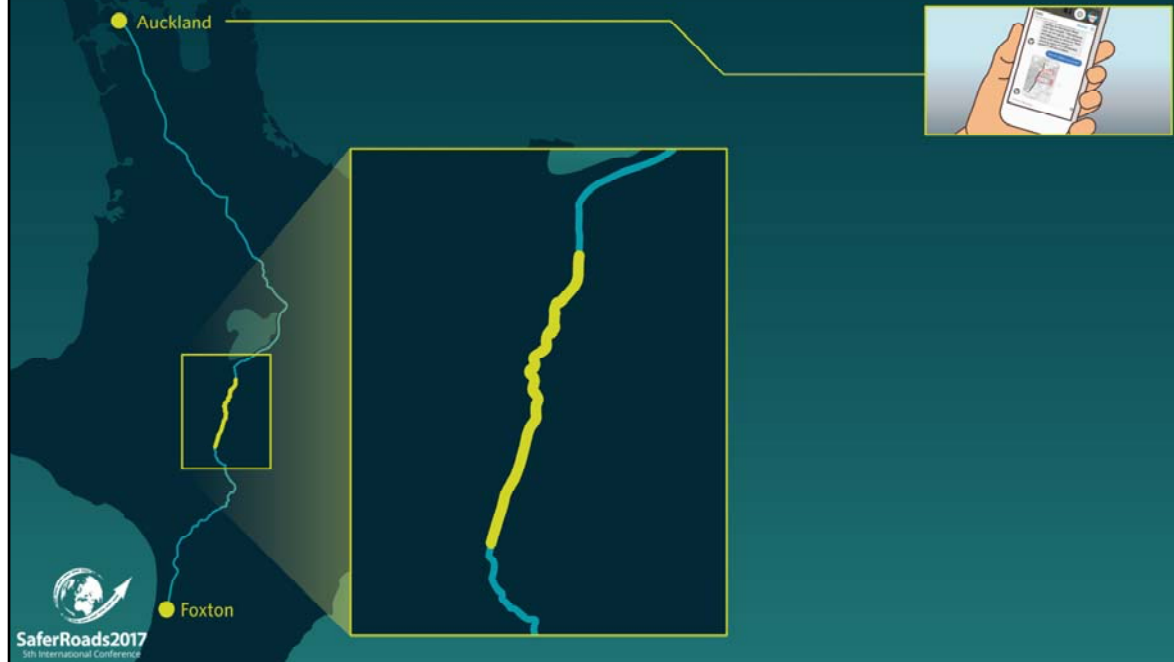


Retell Scott and Amber's story with interventions in place.

# Scott's Story - Future State

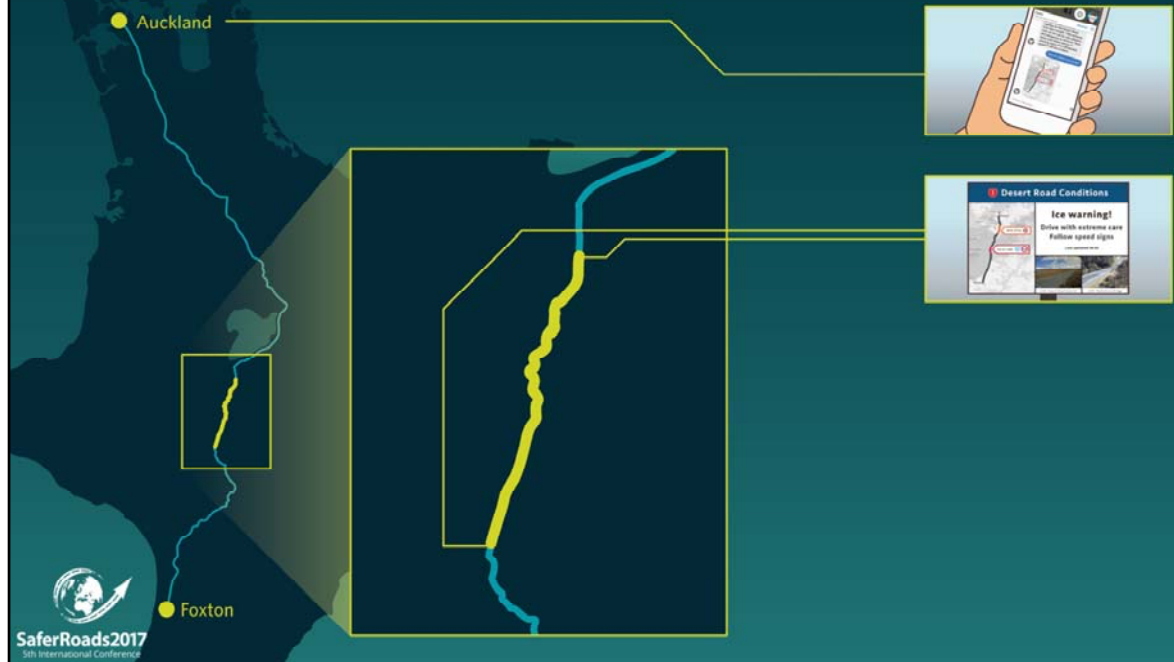


# Scott's Story - Future State

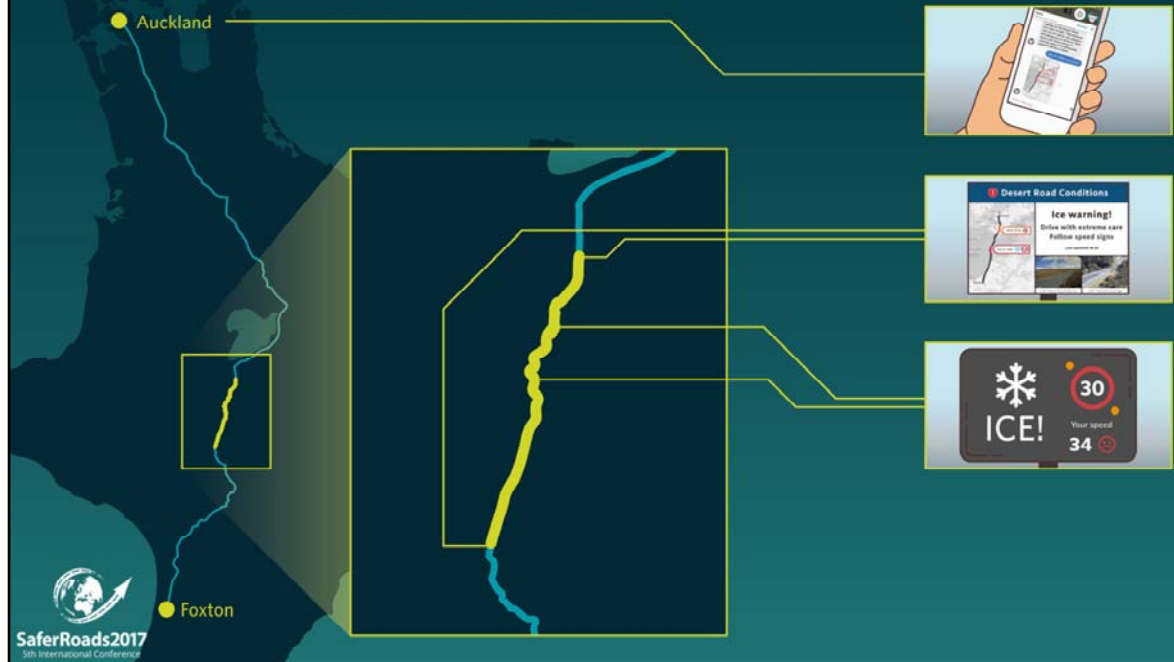




# Scott's Story - Future State



# Scott's Story - Future State



# Scott's Story - Future State





We are proud of our design and we were really excited to present this concept back to our CEs and get a ringing endorsement from them on it. I think the things that we love about it are:

That it connects ordinary New Zealanders with complex data in simple, new and innovative ways

It addresses the problem from many angles, and so we're not looking at attributing blame on the driver or the way the road was engineered – it's a holistic solution.

It's expandable and re-usable – if it works on the desert road, it can work anywhere in NZ or the world. With respect to Dustin, he's only limited to the data and conversations you programme into him – if you're asking him about the weather, what's to say you can't ask him about registering your vehicle?

It enables the customer to make smart decisions about their journey before they've even left home, then at key points throughout their journey, we're giving them more information

And finally, it takes safety to the customer: Dustin isn't something you have to download or go searching for – he's in channels our customers already use, like messenger or twitter, he is the smart signage that you see at Waiouru or Turangi and he's the variable signage that you see along the desert road. We are engaging with the customer actively, in ways that they are already used to being engaged with.

# Lessons Learned / Keys to Success



Peter's reflection

Damien's reflection

# Conclusion



Ultimately, we want the story not to be about the innovative new concept we developed or the stressful near miss Scott and Amber had on the Desert Road.

We want it to be about the uneventful journey they had on their way to Foxton.

Maybe they talk the new signs, or the chatbot or the heated pavement trial they saw along the way and that would be cool, but once Dustin is deployed we expect they will simply have a safe, calm and uneventful journey that allows them to enjoy the evening with their friends and the cricket game the next day.

Because that's what safe journey should look like.



# Thank you



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