Welcome back to this second video that's exploring the modelling and problem-solving exercise that we are constructing for the Further Mathematics module of networks and decision maths. In terms of the information that we are going to construct, we've posed the idea of inner-city streets that are one-way and trying to get to a specific venue via these one-way streets.

So this video will look through the information that we think is relevant, some questions that we believe might be related to the problem itself, some content of mathematics that will be used throughout and then what the Part 1 version might in fact look like as a written presentation. In terms of the information itself and the sources of information it's really trying to network and resource some city streets particularly one-way streets, and of course Melbourne has some, other cities have them, international cities have them.

So looking at a network of one-way streets is your first idea of some information that would certainly be relevant and then as we get into the time element linked to the travel, what sorts of traffic calming devices might actually be used in terms of monitoring street behaviour, car travel, time of travel, et cetera, as you go through. So they're really the two main areas of information that I would be sourcing and of course, any map can be investigated from a central business district idea for one-way streets. Rarely do you find these out in open areas so it needs to be confined to certainly a built up or urbanised area and the traffic calming devices, a general search of these will bring up the main ones that are used in terms of calming the traffic through various networks.

In terms of the questions of interest, these came to mind really from that venue idea and trying to get to it. So if I was looking at just a single city-block where one-way travel was being considered, what could that one-way travel look like around that city block. Could I get to a particular destination, could I get to any destination in that single city-block and that was where a good initial starting point was proposed. That would be reasonably straightforward for most students to then go and undertake, either by diagram or by prior knowledge, the idea of travelling along on these one-way streets.

The network could then be expanded, so more city-blocks, how many could be up to the development of the task. So maybe you move through systematically. One initially, two, et cetera. Maybe it's just a randomization of how many of these city-blocks you would actually like. Maybe it's one initially, two, four, an odd number. See if that actually fits in and then the bigger city precincts and the one-way travel throughout, does it actually make and can it actually make some particular places inaccessible if one-way travel is considered through that network and that was more an exploration of what that might actually look like as you move forward through these particular scenarios of city-blocks and how they then come about.

So trying to get this developed into some sort of a task is then the next part of the process. In terms of relevant material that might be useful for this particular task, graphs certainly, possibly di-graphs, terminology of graphs, the conventions linked to them, the idea of walks, trails, paths, cycles, circuits could certainly be brought into this aspect of the task itself. So even though you are developing a lot of trial and error, if you like, through some of these diagrams the mathematics behind it, even though somewhat hidden, is still actually quite applicable. So quite condensed as well in terms of that content that we are looking at and remember problem-solving and modelling tasks, just like application tasks don't have to contain a large amount of material.

So in trying to develop what the task might in fact look like was really where this element now came in. So considering a single rectangular city-block, describe a journey around a city-block that's a single variety. If you were then going to connect a few of these together how could one-way travel occur through those networks for several different configurations, what might it look like, do you get some areas that are inaccessible, can you make some corners inaccessible. If you were to summarise your findings is there some overall conclusion that you can actually reach? Is there a pattern that you are trying to form throughout this investigation?

And then the third part of that first component, in terms of other city-blocks, I've suggested nine. Initially a square can be formed out of nine. The one-way roads that can actually be drawn into that city-block of nine, configurations that can be constructed, developing whether inaccessible areas occur, corners, et cetera. So there's a good area of development just through these first three parts of trying to get the question in a format that students can now get their 'teeth' into and be able to develop in some particular way and form.

The task itself for the indicative content and this is where the mathematics comes in, so this is a dot point, and it's always a good idea as you are developing each of these questions, problem-solving, modelling, application tasks to have beside you a sheet of paper where you're going to now write down all of the content areas from the study design. There maybe two, three, four, as you develop along. So just listing each of them will then give you the idea that you're covering the mathematics that needs to be covered and it gives the affirmation behind the task itself. That it is being developed in the guidelines of a modelling and problem-solving task particularly with Further Mathematics and then being able to actually see what that looks like. So in terms of the construction of this particular task and noting down levels of content, this is where we begin.

So the next part we would actually be looking at, would be the further development of the task itself. So Part 2 if you like and what that might actually look like as well. So I will see you back shortly where we can discuss Part 2. Thank you.

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