The Story of Shaky City

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The device of Socratic dialogues to stimulate critical thinking, challenge assumptions and stimulate moral, philosophical and mathematical debate goes back at least as far as the book of Job in the Old Testament and thence through Plato and Descartes and others to remain a feature of contemporary lecture theatres. It is in that spirit that the following story is offered.

Extinguishing a road

We must be careful of aphorisms such as 'once a road, always a road' and similarly 'the exceptions prove the rule.' But roads usually stay roads, and the only exceptions I can think of include: 1) roads can be extinguished by the process of road stopping under the 10th schedule of the Local Government Act 1974 (s342) or Public Works Act 1981 (s116), and 2) when an unformed road becomes part of the foreshore and seabed under the Marine and Coastal Area (Takutai Moana) Act 2011 (s14) it ceases to be legal road.

It has been claimed that a road may cease to be a road when the surrounding land is declared to be a National Park without a statement about the roads being excluded. Indeed some National Park declarations have specifically stated that some roads are excluded from them. However, given the over-riding importance of access to and through land that roads provide, it seems unlikely that the Crown would have intended for roads to be extinguished through land where at least one purpose is to allow for public access.
he merely shrugged and said ‘c’est la vie’, then set about performing prodigious mathematical algorithms to model the earth movement and re-coordinate any shaken-up positions.

The last surveyor, whose name was Mud, wore an “I love monument cadastres” T-shirt especially to reassure the rangatira. He also began by surveying all the marks, but with one important difference — before fixing existing boundary marks, he tapped in a flat-topped nail and measured to this, and for new boundary marks he used next generation marks with well-defined centres. ‘The more marks to reconstruct from the merrier,’ said Mud. He always checked his surveyed positions with a double-tie or an independent GNSS fix, and his best adjusted values he submitted as an Excel file of “observation coordinates”, specifying that the tacked boundary marks henceforward carried the same weight as the origin marks from which they were surveyed.

‘But you have not supplied vectors,’ complained the rangatira in Te Whanganui-a-Tara, ‘and everyone knows that only vectors stay constant when the earth moves.’

‘What don’t you understand about the joins between observation coordinates also being vectors?’ asked Mud. ‘The only downside is that I’ll have to forego the pleasure of calculating all those lovely missing lines.’

‘But hang on,’ said the rangatira. ‘You forget that the coordinates of marks will change over time, especially relative to the far-away PositioNZ mark.’

‘Here’s what I do when a mark gets liquifacted,’ Mud explained. ‘I upload the most recent observation coordinate file to my GNSS or Total Station data logger, and then survey a number of marks in the vicinity to ensure good redundancy – all checked and approved marks now have equal status, don’t forget. I begin by using a 2D transformation to see which marks still occupy the same relative locations and so can be assumed not to have moved.’

‘But their coordinates will probably have changed,’ objected the rangatira.

‘Not the inverses though,’ said Mud. ‘I infer vectors from the two closest unmoved marks, calculate a polar and check polar vector to compute coordinates of the liquifacted mark on my current survey system, and then replace it.’

‘But Landonline was built for vectors,’ said the rangatira.

‘Even if that doesn’t change,’ said Mud, ‘and it may yet have to, a spreadsheet of observation coordinates accompanying each survey would save plenty of time, could avoid copying errors, and would make it easier to derive weighted means that check measurements contribute towards. Granted, there is still an issue with occupation boundaries, because equity dictates that occupiers should not have to move their structures, but with such a dense network of survey control I’m sure something will be possible.’

Gentle readers, who should get the Emersons?

Current debate

The discussion above is relevant because of the recent (and indeed, historical) debate about the legal status of a road from Haast to Hollyford Valley traversing parts of the Fiordland National Park. While I have not fully investigated all the surveys and changes of land title and management in this area, by applying the above principles, I am convinced that the road remains a public legal road.

One of the arguments against the road legality is that it has not been clearly defined by survey; specifically it has not been laid out on the ground. While surveyors routinely seek to mark boundaries on the land, and the cadastre is very much tidier and overt when the boundaries are marked on the ground, this marking is not a prerequisite for a legal road — at least in selected circumstances.

Significant problems remain however, beyond the ‘simple’ question of legality. The definition is extremely limited: only superficial dimensions, alignment indicated on large format very old plans which appear more topographical than cadastral, but clearly a strip coloured burnt sienna. The requirements for a route for a new highway built to today’s standards will be quite different from what is needed for, and currently provided for, a walking track. It may be expected that the original surveyors may have expected a road to be formed sometime in the future, so their intent would have been to set aside a practical route. If the law can take a liberal view of the intent, then there may be no barrier to road construction (apart from cost, environmental impact, loss of unique wilderness, and widespread public objection!).

Any application for construction consent may require the road to be stopped in its entirety and a new as-built alignment legalised by survey. This should obviate the need for a full redefinition of the old (and maybe redundant) survey position, with its attendant problems with boundary intersections, severances and efforts to build within inappropriate boundaries.

While there may be a very logical and well argued case against the construction of this road, the legality of the road does not provide a cause for objection.

Note: full references are available from author.

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