KAIWHARAWHARA BRIDGE – THE BIG SIDEWAYS PUSH

SMART INFO

February 2015

Creating another northbound lane from the Aotea on-ramp to the State Highway 1/ State Highway 2 split is an important part of achieving the objectives of this project.

As part of the effort to find space for the fourth lane, an unused bridge stub is being brought back into service. The bridge stub is left over from when the Thorndon Overbridge was built in the early 1960s. The original plan proposed an interchange at Ngaio Gorge with on and off ramps at Kaiwharawhara, but these were never fully put into action. The two-span bridge stub (each 30m long and 11m wide), unused for decades, is about to be pushed into a new millennium and a new lease of life.

RE-PURPOSING THE BRIDGE MAKES SENSE FOR A FEW REASONS

1. At the Aotea Quay end of the site, the Thorndon Overbridge requires widening to fit the fourth lane. Widening a large structure like the overbridge would need a significant amount of structural work. And because the stub off-ramp bridge is very near, it's more practical and cost-effective to move and re-use that structure, rather than construct a whole new bridge clip-on.
2. The bridge stub is generally sound. Its foundations were upgraded as part of the Thorndon Overbridge seismic retrofit in the late 90s.

TECHNICALLY CHALLENGING

It's a technically challenging task to lift and move a 300 tonne, two-piece bridge. To achieve the task, the team will use up to eight hydraulic jacks, each capable of lifting 100 tonnes. The jacks are linked and controlled by a computer which synchronises them to within a 1mm tolerance. This ensures each part of the bridge is lifted evenly and equally as any significant difference could cause the structure to crack, reducing its integrity.

The lifting and moving process

1. The stub bridge is lifted approximately 150mm off its foundations.
2. The jacks hold the bridge in its lifted position for a day while a temporary steel holding structure is assembled in place.
3. The bridge is lowered onto its temporary holding structure.
4. Existing foundations are demolished and new ones built in the correct position and height.
5. The bridge is lowered one metre onto, and connected to, its new permanent foundations.
6. It's pushed 1.5 metres sideways to its new position, approximately 800mm from the existing roadway on the Thorndon Overbridge.
7. Steel reinforcing rods are drilled and inserted horizontally into both the stub bridge and the overbridge.
8. The rods are connected and concrete is poured into the space, closing the gap and 'stitching' the bridges together.
9. The road surface is laid over the top, and a new lane is created.

FINDING SPACE FOR THE EXTRA NORTHBOUND LANE

The team is using every trick in the book to find the space for the new lane. For example, a small grass verge just north of the Aotea on-ramp, as well as an unused bridge stub at Kaiwharawhara will be put to use as part of the new lane. Also, replacing the existing gravel-filled median barrier with a narrower concrete extruded barrier will provide an extra few metres of valuable road width.

TIMING

It'll take at least two months to prepare, move, and then settle each 30m span of the stub bridge into position. The first span will be moved in March, and the second in April.