Did the bat cross the road? More traffic, less bat activity

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There is uncertainty about whether or to what extent roads impact New Zealand's endemic bats. This has led to considerable debate at the consenting and planning stages of road development. Long-tailed bats have been shown to commute and forage along forest edges, including relatively remote forestry roads and roads within national parks, but given these are low traffic areas it is not clear whether increasing traffic volumes may affect bats use of roads. In order to address this uncertainty the New Zealand Transport Agency funded a research project investigating bat activity and traffic volume.

We investigated the relationship between long-tailed bat activity and traffic volume by recording bats' ultrasound echolocation calls using automated bat detectors. We recorded bat activity in this way at 57 traffic monitoring sites along State Highways with varying traffic volumes. At each site we simultaneously recorded bat activity both alongside the highway and approximately 200m distant from it. We used generalised linear mixed-effects modelling to investigate the relationship between bat activity and traffic volume.

Our top model predicts bat activity to be higher at sites distant from the highway compared with sites adjacent to the highway. It also predicts that activity adjacent to the highway will have a negative relationship with overnight traffic volume, whilst sites distant from the highway will be unaffected. Road side bat activity appears to decline rapidly as traffic volume approaches 1000 vehicles per night. This is equivalent to the overnight traffic travelling down Morrinsville road approximately 4 km from this conference venue; or State Highway 1 south of Tokoroa.

Given that traffic volume in New Zealand is predicted to continue to increase, it is critical to determine whether this impact has any negative consequences for bat populations, and if so to develop effective mitigation measures to counteract this effect.