

**BEFORE THE KĀPITI COAST DISTRICT COUNCIL**

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**IN THE MATTER** of the Resource Management Act 1991

And

**IN THE MATTER** of an application for construction and operation of a Countdown supermarket at 160 Kāpiti Road, Paraparaumu (RM210151)

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**STATEMENT OF EVIDENCE OF ANDY CARR  
ON BEHALF OF TEMPLETON KĀPITI LIMITED**

**15 MARCH 2022**

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## **Qualifications and experience**

- 1 My full name is Andrew (“Andy”) David Carr.
- 2 I am a Chartered Professional Engineer and an International Professional Engineer (New Zealand section of the register). I hold a Masters degree in Transport Engineering and Operations and also a Masters degree in Business Administration.
- 3 I served on the national committee of the Resource Management Law Association between 2013-14 and 2015-17, and I am a past Chair of the Canterbury branch of the organisation. I am also a Chartered Member of Engineering New Zealand (formerly the Institution of Professional Engineers New Zealand), and an Associate Member of the New Zealand Planning Institute.
- 4 I have more than 32 years’ experience in traffic engineering, over which time I have been responsible for investigating and evaluating the traffic and transportation impacts of a wide range of land use developments, both in New Zealand and the United Kingdom.
- 5 I am presently a director of Carriageway Consulting Ltd, a specialist traffic engineering and transport planning consultancy which I founded over eight years ago. My role primarily involves undertaking and reviewing traffic analyses for both resource consent applications and proposed plan changes for a variety of different development types, for both local authorities and private organisations. I have also previously acted as a Hearings Commissioner for Greater Wellington Regional Council, Ashburton District Council, Waimakariri District Council and Christchurch City Council.
- 6 Prior to forming Carriageway Consulting Ltd I was employed by traffic engineering consultancies where I had senior roles in developing the business, undertaking technical work and supervising project teams primarily within the South Island.
- 7 I have been involved in a number of proposals which have involved assessing the traffic generation and effects of large commercial developments, including evaluating supermarket proposals in Lincoln, Nelson, Christchurch, Rolleston, Queenstown, Cromwell and Dunedin. As a result of my experience, I consider that I am fully familiar with the particular traffic-related issues associated with such resource consent applications.

## **Code of Conduct for Expert Witnesses**

- 8 I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2014 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is within my area of expertise. I

have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

### **Scope of Evidence**

- 9 In this matter, I have been asked by a submitter, Templeton Kāpiti Limited, to review and comment on the transportation-related aspects of the proposal for a new supermarket at 160 Kāpiti Road.
- 10 To date I have reviewed not only the original application documents but also the various responses to Requests for Further Information. The specific documents are:
  - a. Appendix 5 (Integrated Transportation Assessment (ITA)) of the AEE
  - b. E-mail response to Request for Further Information dated 1 July 2021
  - c. Response to Request for Further Information dated 12 August 2021
  - d. Response to Request for Further Information dated 29 September 2021
  - e. Response to Request for Further Information dated 21 December 2021
- 11 All of these documents have been produced by Tim Kelly Transportation Limited.
- 12 I have also reviewed the Statement of Evidence produced by Mr Kelly, and the s 42A report produced by Ms Marnie Rydon, consultant planner to Kāpiti Coast District Council. This relies for transportation matters on the Statement of Evidence of Neil Trotter, Transport Safety Leader at the Kāpiti Coast District Council. I comment on these as appropriate within my evidence.
- 13 I provided a review of the information available to me at the time, and this formed part of the submission made by Templeton Kāpiti Limited (Carriageway Consulting letter report dated 10 November 2021). To some extent, Mr Kelly has responded to these concerns, and so within this Statement of Evidence, I have focussed on the two primary areas where I consider that there remains the potential for a significant adverse road safety and efficiency effects to arise – the matters of traffic growth on Kāpiti Road, and the issues associated with any necessary improvement schemes at the Kāpiti Road / Friendship Place / Site Access roundabout. These matters are addressed within paragraphs 40 to 49 of Mr Kelly's Statement of Evidence.

### **Executive Summary**

- 14 Based on my review of the application documents, I am concerned that the analysis relies on traffic flows on Kāpiti Road either reducing each year or remaining

constant. In my view this is a very unlikely outcome, and rather, I consider that it is most likely that there will be an increase in traffic flows over the next few years on Kāpiti Road. This is not a scenario that Mr Kelly has considered.

- 15 None of the improvement schemes that Mr Kelly has devised are based on any traffic growth occurring on Kāpiti Road. I therefore consider that there can be no certainty that they are appropriate to mitigate the adverse effects on queues and delays of the supermarket in the event that traffic flows increase.
- 16 I support in principle Mr Kelly's suggestion of a condition of consent to monitor the traffic-related effects of the supermarket with a view to implementing improvement measures at the Kāpiti Road / Friendship Place / Site Access roundabout in future. However, such a condition of consent is only appropriate where there can be certainty that suitable measures are able to be constructed. In my view, Mr Kelly has not shown that this.
- 17 I therefore do not consider that the traffic-related effects of the proposed supermarket have been appropriately modelled or assessed, nor has it been shown that the adverse effects are able to be adequately mitigated. I am therefore unable to support the proposal from a transportation perspective.

#### **Concern 1: Traffic Growth**

- 18 The issue of traffic growth is important to consider within the context of this resource consent application because Mr Kelly has assessed the effects of the additional traffic generated by the supermarket for a 'design year' of 2026. In short, the question is whether in 2026 (and without the supermarket), traffic flows will have reduced on Kāpiti Road compared to 2018, stayed the same, or increased.
- 19 In the ITA, Mr Kelly establishes that the Saturday peak period is the period with the higher traffic flows. Within his Statement of Evidence, he sets out (paragraph 41) that his initial assessment showed "*a trend for Saturday peak period traffic volumes to decline*".
- 20 Traffic volumes declining on any road in the country over the medium term is a highly unusual trend. I am aware that when fuel prices reached \$2 per litre, there was a short-term reduction in personal travel and thus a short-term decline in traffic volumes, but this lasted for less than a year. I am also aware that Covid-related travel restrictions have led to short-term reductions in traffic flow, likely due to a combination of lock-downs, changes in personal travel (such as working from home) and few overseas tourists. However these too will also be temporary.
- 21 I do not agree with Mr Kelly's view that there is a "*trend*" for traffic volumes to reduce, because in fact, it is just one observation, taken between 2019 and 2020. Within my letter attached to the submission, I set out the reasons why I considered

Mr Kelly had observed a reduction in traffic flows between these two years, when growth in traffic was seen in the previous two years between 2017 to 2019. I refer to my earlier letter for a more detailed explanation, but in short, I consider that the likely reason is because a different amount of travel is undertaken in different months of the year (this is known as 'seasonality'). The 2020 traffic count was taken in November and the 2019 traffic count was taken in August, and so I would expect that the 2020 will show less traffic due to seasonality.

- 22 In the ITA, and again in his evidence, Mr Kelly states that in his view, a plausible explanation for the reduction in traffic flow is 'peak spreading'. This is a phenomenon which arises on congested road networks, where drivers change their travel times to make journey either earlier or later than they would do otherwise, in order to minimise their experience of delays. However, peak spreading does not result in reductions in the peak hour traffic flows. It is simply that as more drivers attempt to use a road, congestion increases and so a proportion of drivers travel at a different time (earlier or later). In other words, the peak hour traffic 'spreads' to be earlier or later. Traffic flows do not reduce.
- 23 I have shown this conceptually in Annexure A.
- 24 I therefore do not agree with Mr Kelly that peak spreading is a reason for the observed reduction in traffic flows. By way of further examples found in Mr Kelly's data, if the road was able to carry 913 vehicles per hour westbound in 2019 and the road was operating at capacity such that peak spreading occurred, this should mean that the traffic flows would remain around this value as the peak 'spreads'. Volumes should not reduce by 10% to the 820 westbound vehicles that were observed in 2020. Furthermore, there is no evidence of peak spreading in the graphs provided by Mr Kelly in the ITA (Figure A2).
- 25 That said, for the sake of argument, I have considered the outcome if Mr Kelly was to be correct in his assertion of peak spreading. In this regard, I consider it is important that in order to assess the effects of the proposed supermarket, Mr Kelly has not only calculated a recent reduction in traffic flows, but then also applied this into future years. That is, he has extrapolated from the one data point (the reduction in traffic flows seen between 2019 and 2020) and applied this year-on-year to find traffic flows in 2026. Again, this approach has no foundation in the notion of peak spreading. Bluntly, even if peak spreading was to be occurring, this does not mean that traffic flows in the future will reduce (or continue to reduce).
- 26 From a practical perspective, I am unaware of any road in New Zealand where traffic volumes are expected to steadily reduce by 1.5% per annum for the next few years. In the absence of any information to show that Kāpiti Road is somehow unique in the country, I again consider that a regular reduction in traffic flows is unlikely.

- 27 As a final point regarding an ongoing reduction in traffic flows on Kāpiti Road, in his Statement of Evidence (paragraph 55), Mr Kelly sets out that in considering traffic growth he has not taken into account any future development. In my previous letter, I noted that a considerable amount of development could occur in the immediate area, and in particular at the Airport Mixed Use Precinct where an assessment of transportation effects is only required when a cumulative gross floor area of 43,050sqm GFA is exceeded. However I am now advised that up to 102,900sqm GFA could take place as a Controlled Activity. This is, while a resource consent application is required and conditions of consent can be imposed, it cannot be declined. Development of this scale will inevitably generate new traffic on the road network. Mr Kelly's Statement of Evidence clearly shows that he has not taken this into account.
- 28 In summary then, I therefore remain of the view that Mr Kelly's calculation of traffic volumes in future years through assuming a year-on-year reduction in volumes is not correct. Not only is it based on just one data point, but this has then been extrapolated into future years without justification. Further, the reduction in traffic volumes seen between 2019 and 2020 is not explained by the rationale of peak spreading that has been put forwards. In short, ongoing reductions in traffic volumes are not seen on roads within New Zealand.
- 29 Ultimately this creates a future year scenario where up to 102,900sqm GFA of new development can occur within the Airport Mixed Use Precinct while simultaneously Mr Kelly expects traffic flows on the adjacent Kāpiti Road to reduce. This is an extremely unlikely outcome, at best.
- 30 I acknowledge that within his letter report of 21 December 2021 and again in his Statement of Evidence, Mr Kelly also evaluated a scenario where there is zero traffic growth on Kāpiti Road. That is, current and future traffic flows remain the same. However if the 102,900sqm GFA of new development within the Airport Mixed Use Precinct generates any traffic at all, then zero growth cannot arise – there must be an increase.
- 31 Taking all of the matters above into account, I am unable to support a scenario where traffic flows on Kāpiti Road reduce, and it is unlikely in my view that they will stay the same in future. Rather, I expect traffic volumes on Kāpiti Road to increase by the design year of 2026 that Mr Kelly has used.
- 32 Having reviewed the Statement of Evidence of Mr Trotter, the Council's Transport Safety Team Leader, included with the Council's s 42A report, I note he also expresses concern regarding the use of ongoing reductions in passing traffic (his paragraph 7.8). Mr Trotter notes that he requested an assessment adopting zero traffic growth but as discussed above, I do not consider that even this reflects likely outcomes.

## **Concern 2: Improvements to the Kāpiti Road / Friendship Place / Site Access Roundabout**

- 33 The matter of traffic growth is important because it determines the environment into which the supermarket will add its own traffic. The approach taken within the ITA was to assume that traffic flows on Kāpiti Road reduced by 2026, and then to add on the traffic associated with the supermarket. This led to the outcome where the future year scenario was little different to the current year (this was because the traffic reduction applied was very similar to the extra vehicles generated by the supermarket). Unsurprisingly, this analysis went on to show that the Kāpiti Road / Friendship Place / Site Access roundabout would operate satisfactorily.
- 34 Within his Statement of Evidence (paragraph 42), Mr Kelly describes that with zero traffic growth on Kāpiti Road, that is, future passing traffic flow remaining at the same level as at present, adding the additional traffic generated by the supermarket on the Kāpiti Road / Friendship Place / Site Access roundabout would mean that Level of Service F would arise. He rightly notes this (footnote to paragraph 20) as being the worst level of service on a scale of A to F, and represents “*heavily congested*” conditions. This is supported by the analysis of the roundabout carried out by Mr Kelly (his letter response dated 21 December 2021) which shows that with zero traffic growth, and no changes to the roundabout, there would be delays of nearly three minutes per vehicle for drivers attempting to enter the roundabout from Friendship Place.
- 35 As well as representing a high level of delay, Level of Service F also results in adverse road safety effects. This is because once delays become substantial, drivers tend to accept shorter gaps in the opposing traffic stream, with a consequential risk that the gap is too short and a collision occurs.
- 36 To reiterate, the ‘zero growth’ scenario assessed by Mr Kelly does not allow for any growth in traffic flows whatsoever in the passing traffic on Kāpiti Road. In the event that there was to be any increase, or an increase in the amount of traffic using Friendship Place, these delays would be even higher.
- 37 In order to reduce delays, Mr Kelly has proposed two potential upgrades to the roundabout. One of these upgrades is the provision of an additional traffic lane on Friendship Place. In the ITA, Mr Kelly identified that this is needed even assuming that traffic flows on Kāpiti Road are expected to reduce in future. A second lane will be therefore also be required if traffic flows remain constant or increase.
- 38 Within my letter accompanying the submission, I highlighted that the information provided at that time did not give confidence that the scheme to improve Friendship Place was viable. For example, Figure 3 of the ITA shows the site layout but includes an annotation that the additional lane on Friendship Place is “*indicative, to be confirmed*”. Mr Kelly’s letter report dated 21 December 2021 noted that “*no*

*detailed design has been undertaken*” for adding the second lane, and the last page of Mr Kelly’s Statement of Evidence includes a scheme but I note the drawing is entitled “*Indicative Road Layout Changes*” (my emphasis).

- 39 From a practical perspective, the solution of adding a second lane onto Friendship Place will increase capacity. This is because when there is a gap in the approaching traffic, two vehicles will be able to enter the roundabout at the same time (one from each lane) rather than just one vehicle. However, as an approach widens to form a second lane, at the initial stages of the widening there is still only one traffic lane provided (albeit a wide one). The second lane only commences at the point where two vehicles are able to be side-by-side. This means that for two cars to queue side-by-side at the roundabout, there has to be enough width in the approach for them to pass.
- 40 I have assessed the layout attached to Mr Kelly’s evidence. Initially I applied a standard vehicle swept path to show how a car turning left at the intersection would be able to manoeuvre into the left-turn lane. I then looked at the width remaining for another car to pass the first. This is shown below:



**Figure 1: Cars Passing on (Widened) Friendship Place**

- 41 The Figure above shows that when there is one car waiting to enter the roundabout (in this case shown in yellow), another car (in this case shown green) is able to pass to wait alongside. However immediately behind the yellow and green cars there is only enough width for one subsequent car to wait (in this case shown red).
- 42 In other words, while Mr Kelly’s improvement scheme certainly provides an increase in capacity on Friendship Place, the second traffic lane is only the length of one vehicle and so the increase in capacity is not large. In the event that traffic



growth on Kāpiti Road is greater than assumed (which as set out above I consider to be the case), the improvement scheme may not be sufficient.

- 43 The second improvement scheme proposed by Mr Kelly is an additional (but short) traffic lane on the northwestern approach of Kāpiti Road. Although no scheme (indicative or otherwise) has been provided to show this, Mr Kelly sets out that this additional lane can be constructed without requiring third party land (paragraph 49).
- 44 In my experience, it is not possible to simply ‘add a lane’ to any roundabout approach without affecting other key design parameters, such as the need to provide appropriate vehicle deflection around the central island<sup>1</sup>. Consequently, it is typically necessary to make other adjustments to the roundabout geometry. In this case for example, widening the northwestern approach on the eastern side by breaking out the kerb would tend to reduce deflection, and might also mean that vehicles turning left into the supermarket site do not enter onto the circulating carriageway whatsoever. Both of these would create adverse road safety outcomes. Adding the extra lane would also increase pedestrian crossing distances on the northwestern (Kāpiti Road) and northeastern (site access) legs of the roundabout.
- 45 In my view, none of these effects of the additional traffic lane have been properly identified or assessed by Mr Kelly. As I set out in my letter accompanying the submission, in my experience it is extremely common for any development that requires a roading improvement to provide a layout at a scale that can be assessed (by both the road controlling authority and submitters) to ensure that it is appropriate. No such layout has been provided in this instance. Without such a layout being available, I do not see how Mr Kelly can assert (paragraph 49) that all works can take place without the use of third party land. Rather, without a design, it cannot be shown how a complying design is achieved, and thus the extent of land required cannot be known. I note that Mr Kelly also makes no mention of whether he has certainty that the upgraded roundabout would meet relevant design standards/guides.
- 46 Mr Kelly suggests (paragraph 49) that a condition of consent should be put in place to monitor changes at the Kāpiti Road / Friendship Place / Site Access roundabout, with a requirement to upgrade the roundabout if required. I am familiar with this type of condition of consent and have proposed similar arrangements on other projects with which I have been involved. However this approach cannot be progressed in my experience without having confidence that it is possible to implement the improvement scheme that is ultimately adopted. In this case, I consider that there are two significant risks – firstly, that third party land might be

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<sup>1</sup> Without such deflection, drivers tend to ‘straight-line’ the roundabout, and the consequential higher speeds lead to adverse road safety effects. Hence a minimum amount of deflection is required to be provided at every roundabout.

needed, and secondly, that it will not be possible to improve the capacity of the roundabout while meeting all standards/guides.

- 47 In my view, if this condition of consent was to be accepted on the basis of the information presently available, it will mean that when an improvement scheme is needed, there can be no certainty that it can be implemented. It might require land outside the applicant's control, and thus the scheme cannot be constructed. It might create a non-standard design, meaning that the Council would either have to accept the departure from standards (and any consequential adverse effects on, say, road safety) or accept that the levels of congestion cannot be resolved.
- 48 In my view this risk is increased even further in this case, because the assessments of the roundabout undertaken by Mr Kelly (and the potential improvement schemes) are based on traffic flows on Kāpiti Road reducing year-on-year or remaining at current levels. I set out above that I consider both of these to be unlikely outcomes. However there has been no assessment carried out of what improvement schemes will be needed for even a small increase in the passing traffic flows.
- 49 In the event that it is not possible to devise a suitable roundabout layout that provides sufficient capacity in a manner meeting standards/guides and without using third party land, it may be necessary to move to a different form of intersection. Given the nature of the Kāpiti Road corridor, I would expect that this would be traffic signals. However Mr Kelly has not considered whether traffic signals could be accommodated within the available land.
- 50 Finally, I highlight that under Mr Kelly's assumption of traffic flows reducing on Kāpiti Road in future, in the ITA he sets out that an improvement scheme at Friendship Place is still required. Consequently, even if such a condition of consent was to be progressed, this does not remove the need for an immediate widening of Friendship Place.

### **Conclusions**

- 51 Based on my review of the application documents, I am concerned that the analysis relies on traffic flows on Kāpiti Road either reducing each year or remaining constant. The explanation of peak spreading given by Mr Kelly does not, in my view, explain the situation. Rather, I consider that the seasonality of the road is the more likely reason. Further, even if (hypothetically) peak spreading was the case, this does not mean that traffic flows will continue to reduce in each future year as Mr Kelly has assumed.
- 52 I further highlight that when considering future years, Mr Kelly has not taken into account any development that could arise in the Airport Mixed Use Precinct. This

again shows that expecting traffic flows in the immediate area to remain the same or to reduce is not realistic.

- 53 I therefore consider that it is most likely that there will be an increase in traffic flows over the next few years on Kāpiti Road. This is not a scenario that Mr Kelly has considered.
- 54 Consequently, all of the improvement schemes that he has devised are based on a situation where passing traffic flows on Kāpiti Road are either lower than presently occur or they are constant. Since none of the improvement schemes make any allowance for traffic flows on Kāpiti Road to increase, I consider that there can be no certainty that they are appropriate to mitigate the adverse effects on queues and delays of the supermarket.
- 55 Mr Kelly's analysis shows that an extra traffic lane is required on Friendship Place to accommodate the supermarket traffic even under a scenario where the passing traffic on Kāpiti Road decreases. The scheme he has shown provides only a slight increase in capacity, and so in my view, when an allowance is made for some level of growth in passing traffic on Kāpiti Road, there can be no certainty that the short length of additional traffic lane will continue to be appropriate.
- 56 I support in principle Mr Kelly's suggestion of a condition of consent to monitor the traffic-related effects of the supermarket with a view to implementing improvement measures at the Kāpiti Road / Friendship Place / Site Access roundabout in future. However, such a condition of consent is only appropriate where there can be certainty that suitable measures are able to be constructed. In my view, Mr Kelly has not shown that this is the case because he has not evaluated the appropriate scenario (of allowing for growth in traffic on Kāpiti Road).
- 57 I consider that my concerns would be addressed if Mr Kelly was to allow for an appropriate level of traffic growth on Kāpiti Road, model the effects of this, and then devise an appropriate roundabout layout (with improvement measures as necessary) which could then be checked against relevant standards/guides.
- 58 In the absence of this however, I do not consider that the traffic-related effects of the proposed supermarket have been appropriately modelled or assessed, nor has it been shown that the adverse effects are able to be adequately mitigated. I am therefore unable to support the proposal from a transportation perspective.

**Andy Carr**  
15 March 2022

## Annexure A: A Simplified Explanation of Peak Spreading

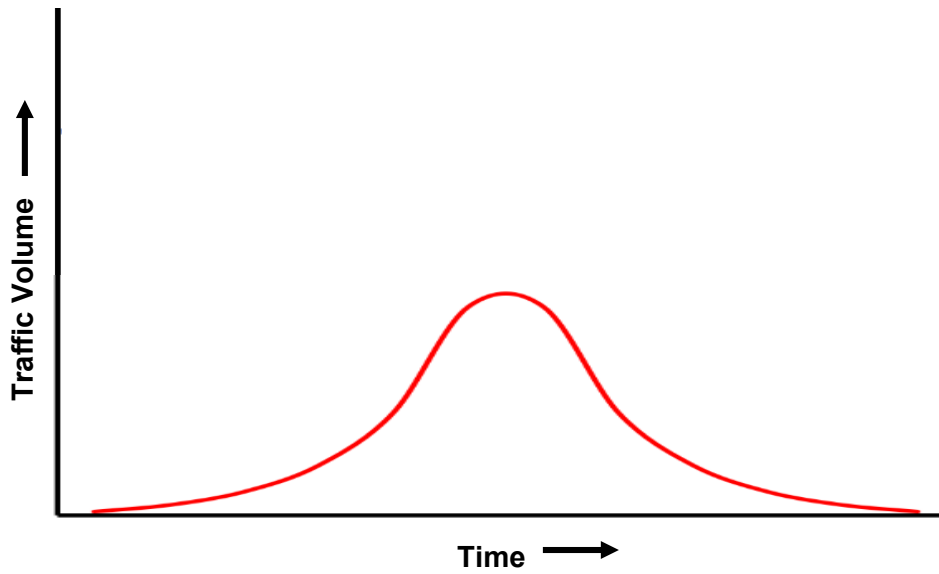


Figure 1: In the peak hour, traffic volumes build up, and then fall away again. Conceptually this can be shown on a graph as above.

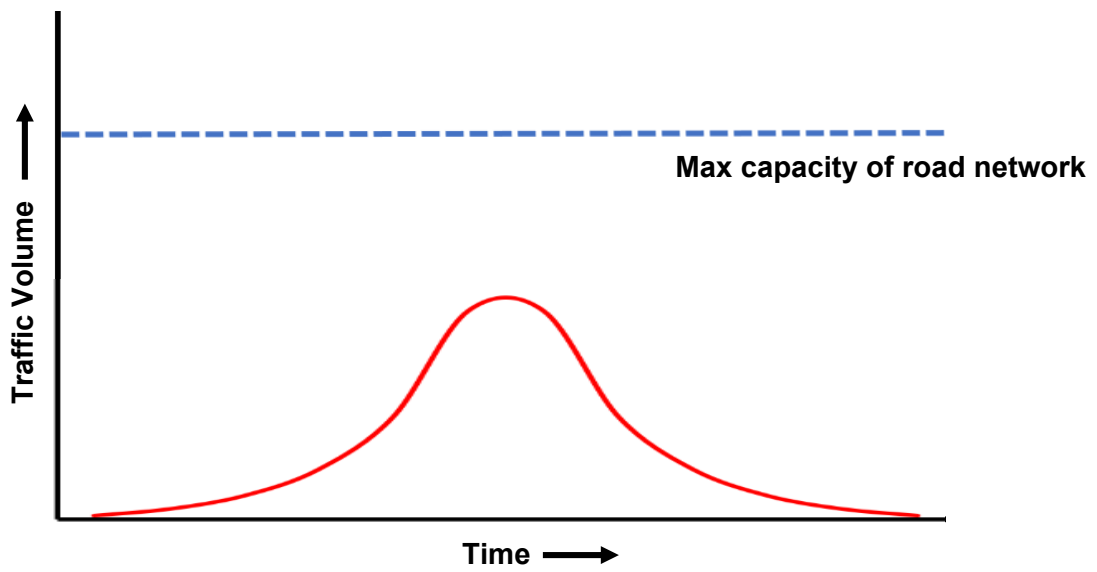


Figure 2: However, the road network has a finite capacity.

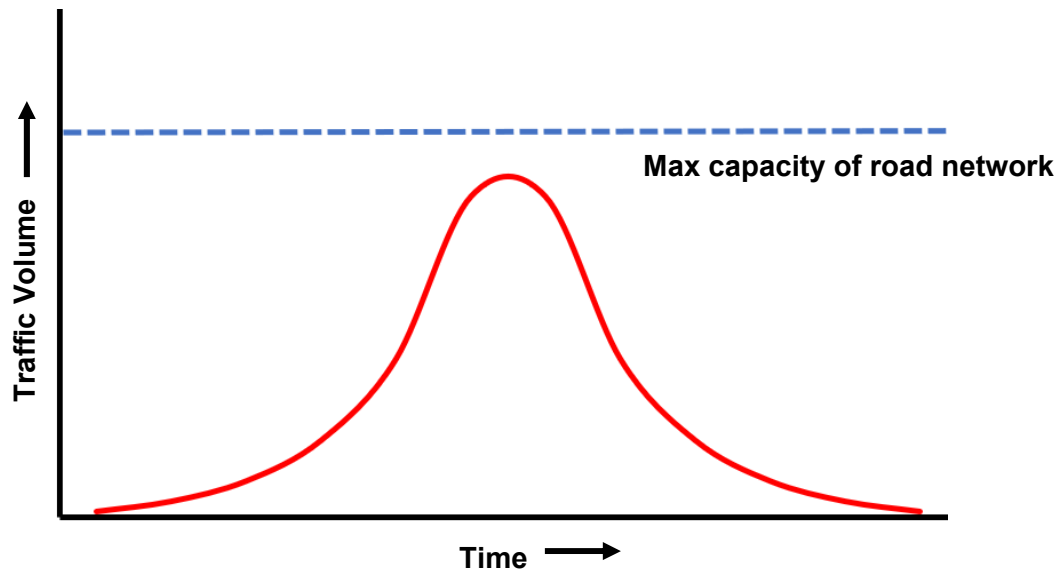


Figure 3: Traffic generally grows over time, as more land use development takes place that people travel to and from (such as new residential areas and new employment locations). This means that volumes on any given road increase over time. As traffic flows increase, this also means that the amount of traffic gets closer to the maximum capacity of the road.

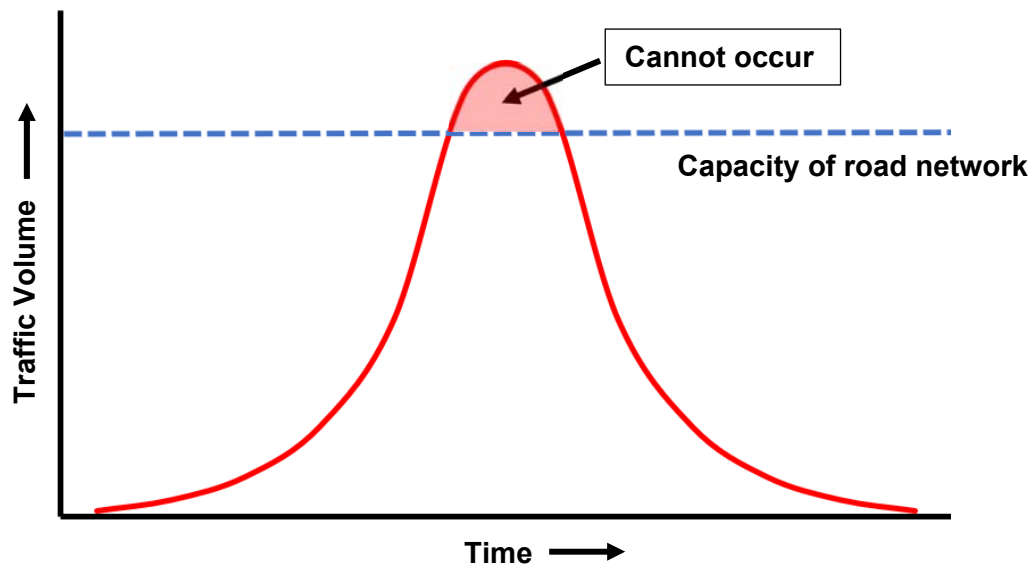


Figure 4: It's not possible to have more traffic travelling along the road than its maximum capacity. This means that there comes a time at which the road simply cannot carry any more traffic.

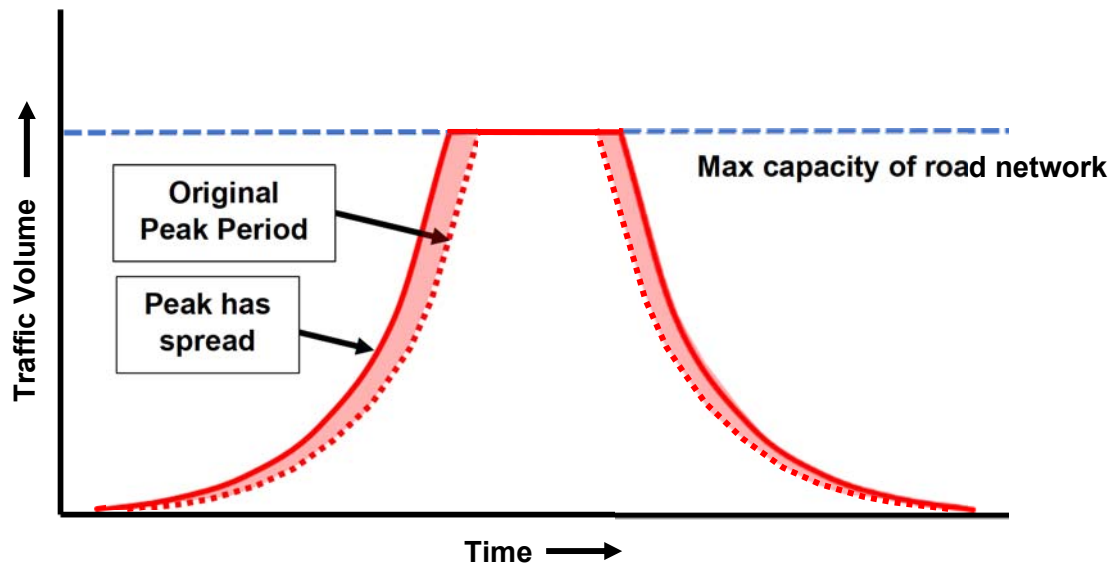


Figure 5: When a road reaches this point, queues and delays for drivers are substantial. There are several things that could then happen. Some drivers are able to change their route and use another road. Other drivers switch to a different mode of travel, such as cycling. However a common change is drivers choose to travel earlier or later than their original time. This means that the time of the peak traffic flows 'spreads'.

Some drivers cannot change their travel time and therefore continue to travel at the busiest time (and have to accept the congestion). At the same time, new land use developments occur which continue to add traffic onto the network. So as some drivers change to travel earlier or later, new drivers are continually added into the network. This means that the road continues to operate at its maximum capacity and the peak 'spreads' further. Traffic flows do not significantly reduce.