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Dear Scott

Proposed Film Studios, Wanaka: Preliminary Assessment of Transportation Matters

Further to our e-mails, we have carried out an initial review of the key transportation matters regarding a proposal for film studios near to Wanaka. As discussed, this is a 'high level' overview, and is intended to review the primary issues relating to site access, to ensure that there are no major impediments to the project progressing to a detailed assessment in due course.

Background

From the information provided, we understand that it is proposed to establish and operate film studios at 707 Wanaka-Luggate Highway (part of State Highway 6), around 6.8km east of Wanaka town centre and 2.4km west of Wanaka airport.

Figure 1: Site Location

The proposal includes sound stages and a workshop, as well as production offices and other facilities. It will also include film tourism activities, cafes/restaurants to serve cast and crew (and the tourism activities) and some film-related retail elements. There may be additional phases of the development in future but we understand that these are not currently proposed (and therefore have not been assessed).

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Figure 2: Proposed Site Layout (Extract from Tilt Architecture Drawing)

Existing Transportation Networks

Road Geometry

Adjacent to the site, Wanaka-Luggate Highway (State Highway 6) has one traffic lane in each direction of 3.5m width. The vertical alignment is generally flat, although there is a slight crest curve to the east of the site and a 'no overtaking' centreline. The alignment is similarly mostly straight, and although there are horizontal curves to the east and west, these are relatively gentle and there are no advisory speed limits at each. The speed limit on this part of the highway is 100km/h, and given the alignment of the highway, we consider that operating speeds will be in the order of 110km/h.

Photograph 1: Example of Cross-Section of State Highway 6

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The legal width of the highway is around 38m and the formed traffic lanes lie towards the southern boundary of this. This results in a grassed verge of around 4m on the southern side of the traffic lanes, but a verge of 20m on the northern side.

The site is currently served by two points of access.

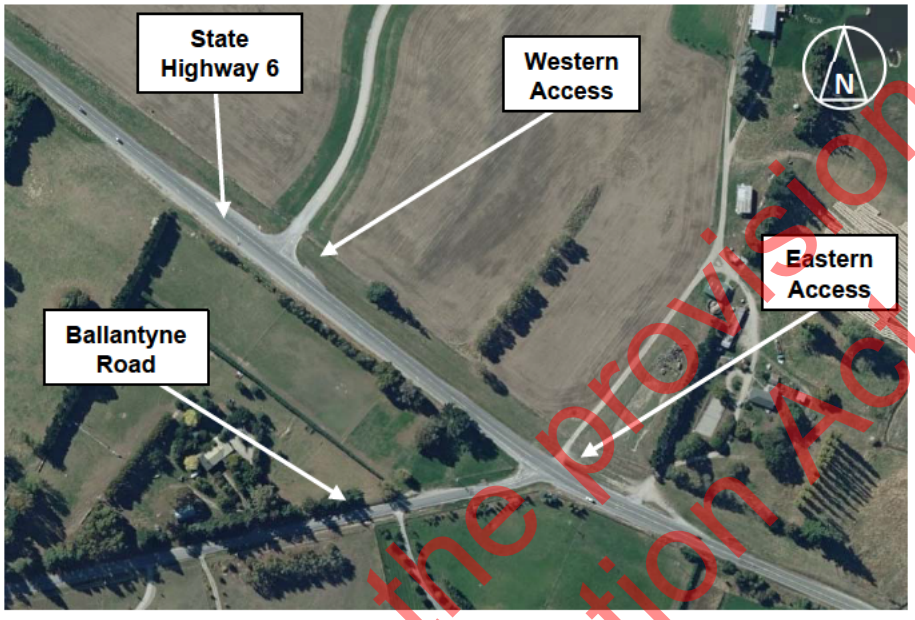

Figure 2: Existing Site Accesses

The easternmost access is located directly opposite Ballantyne Road, a Collector Road in the operative District Plan which links the highway with southern parts of Wanaka. This access onto the highway is visually formed as a driveway having just a single traffic lane which is unsealed. There are no auxiliary turning lanes at this location.

Photograph 2: Easternmost Site Access, Looking West (Ballantyne Road on Left)

The second access is located 240m towards the west, and is formed with a typical intersection layout to Diagram E of the Planning Policy Manual, with shoulder widening for the left-turn movement into the site and widening on the westbound shoulder. The access itself provides two

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traffic lanes, and is sealed with a 'give-way' traffic sign and associated markings. The shoulder widening for the westbound traffic is around 5m wide and is marked with hatching to ensure driver are aware that it is not a traffic lane.

Photograph 4: Westernmost Site Access, Looking East

Traffic Volumes

The New Zealand Transport Agency has a number of traffic counting stations on the state highway network, and the closest counting station to the site lies around 2.4km away (counter 00600895). In 2019 the average daily traffic flow recorded was 5,280 vehicles per day, with a typical morning peak hour volume of 470 vehicles (two-way) which occurred between 8am to 9am, and a typical evening peak hour of 515 vehicles (two-way) which occurred between 5pm to 6pm.

The direction of the peak hour traffic volumes was as follows:

- Morning peak hour: 205 vehicles away from Wanaka and 265 vehicles into Wanaka
- Evening peak hour: 240 vehicles away from Wanaka and 275 vehicles into Wanaka

This pattern is unusual in that in the peak hours, most traffic travels in a westbound direction (towards Wanaka).

The Austroads Guide to Traffic Management Part 3 ('Traffic Studies and Analysis') sets out a process by which the level of service of a road can be calculated. This showed that under these traffic flows, Wanaka-Luggate Highway provides Level of Service C. This is within the zone of stable flow.

Traffic growth over the past seven years (the length of time that the counter has been in place) has been an average of 4.0%, expressed as a percentage of the 2018 traffic flow.

According to the MobileRoad website, Ballantyne Road adjacent to the state highway carries around 450 vehicles per day. The low traffic volume is not surprising, because sections of this part of the road are presently unsealed. The daily volume suggests peak hour volumes will be in the order of 45 to 60 vehicles (two-way).

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Road Safety

We have used the New Zealand Transport Agency Crash Analysis System to identify reported crashes on this part of State Highway for a distance of 250m on either side of the site accesses.

Over the past five years, two crashes have been reported and both occurred at the State Highway 6 / Ballantyne Road intersection.

- One crash occurred when an eastbound vehicle turning right into Ballantyne Road initially pulled onto the shoulder to let following traffic pass, but then turned right directly in front of another vehicle. The crash resulted in minor injuries.
- One crash occurred when an intoxicated driver fell asleep, and their vehicle left the road and it struck a tree. The crash resulted in minor injuries.

We do not consider that the crash record indicates any underlying road safety issues on this section of the highway.

Because of the wide verge on the northern side of the highway, the sight distances at both access points are excellent. The Planning Policy Manual requires a distance of 282m to be provided, and this is achieved (and exceeded), although in most cases, the sightline passes over the verge.

Traffic Generation of Proposed Development

The traffic generation of film studios is not easily assessed because it depends on the nature and scale of the production. The information provided shows the following activities are proposed:

- Four sound stages plus an outdoor green screen: 10,210sqm
- Workshops: 2,043sqm
- Workshop storage: 1,672sqm
- Offices: 5,644sqm
- Food and beverage: 1,161sqm
- Retail: 1,858sqm
- Trailer park for cast/crew and car parking areas: 8,826sqm

This would suggest the following traffic generation:

- Four sound stages plus an outdoor green screen
  - No data available
- Workshops: 2,043sqm
  - Assess as light industrial hence trip generation rate of 1.4 vehicle movements per 100sqm GFA
  - Hence peak hour traffic of 29 vehicle movements (two-way)
- Workshop storage: 1,672sqm
  - Storage areas do not generate traffic in and of themselves
- Offices
  - Standard trip generation rate of 2.5 vehicle movements per 100sqm GFA
  - Hence peak hour traffic of 141 vehicle movements (two-way)
- Food and beverage
  - This is assumed to serve only the people visiting or working on the site
  - Hence no net traffic generation

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- Retail: 1,858sqm
  - This is assumed to serve only the people visiting or working on on the site
  - Hence no net traffic generation
- Trailer park for cast/crew and car parking areas
  - These activities do not generate traffic in their own right

Overall then, the traffic generation of the site will be 170 vehicle movements, plus the crew associated with the sound stages. The latter is difficult to quantify because it will depend on the nature of the production. Furthermore, it is possible that a proportion of the vehicle movements will be made outside the weekday peak hours. However the overall traffic engineering outcomes are in the main not dependent on this, as discussed further below.

Form of Access Intersection

The warrants for turning lanes are set out in the Austroads Guide to Traffic Management Part 6 ('*Intersections, Interchanges and Crossings*'). For an operating speed in excess of 100km/h, and peak hour volumes of 470 to 515 vehicles, then a right-turn lane is required when more than 15 vehicles turn right into the site. We consider that this is highly likely to be achieved, because even if most personnel stay in Wanaka (west of the development site), the threshold of 15 right-turning vehicle movements is easily reached. The warrant is slightly different for a left-turn lane but such a lane is required when 100 vehicles turn left into the site in the peak hour. Depending on whether crew stay in Wanaka, this may or may not be achieved.

Consequently we consider that an auxiliary right-turn lane should be provided, but that the layout should be devised in such a way that a left-turn lane can easily be added if required. This will mean that the seal width of the highway will need to increase by at least 3.5m (for an auxiliary right-turn lane) and potentially 7.0m (if two auxiliary lanes are provided for).

As set out above, the legal width of the highway corridor is in the order of 38m, and the alignment of the existing carriageway is relatively flat and straight. Consequently even if the greatest extent of widening is required, then this can be easily accommodated within the legal corridor.

The western access is properly formed and sealed and is currently able to accommodate a greater level of traffic than the eastern access, but it does not currently include any auxiliary turning lanes. However given the existing formation, we consider that a lesser amount of physical works will be required at this location than at the eastern access. Furthermore, under the NZTA Planning Policy Manual, there is an expectation that an access is located at least 200m from any intersection. This is achieved by the western site access but not at the eastern access (which is directly opposite Ballantyne Road).

Overall then, we consider that the western site access is easily able to be upgraded to meet requirements for auxiliary turning lanes within the legal highway reserve, and also achieve NZTA requirements. We recommend that the eastern site access is not used for the proposal due to more substantial upgrading works plus not meeting NZTA requirements for access spacing.

Performance of Access Intersection

We have carried out a preliminary assessment of the potential queues and delays associated with an access to the site, with a right-turn lane but no left-turn lane, using the computer software package Sidra Intersection. Given that the volume of traffic exiting the site has not been confirmed, the approach we have taken for this has been to test the access iteratively until the point at which the practical maximum capacity is reached is found. Since there is no agreed definition of 'capacity', we have identified the points at which the level of service changes from C to D, and from D to E,

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both of which have been used by NZTA in the past to determine this. In practice, this equates to the point at which drivers experience a delay of 25 seconds and 35 seconds respectively, and since the highest values will arise when the number of people exiting the site is greatest, this must necessarily be in the evening peak hour rather than the morning.

Our results show that Level of Service C changes to Level of Service D when 335 vehicles exit the site in the evening peak hour turning right. Level of Service D arises when 370 vehicles exit the site in the evening peak hour and turn right (the number of vehicles turning left out of the site does not affect this calculation).

As set out above, the workshops and offices would give rise to 170 vehicle movements in the peak hours. Therefore the intersection has the capacity to accommodate a further 165 to 200 vehicle movements without any capacity issues arising. Consequently, given that the sound stages will not be fully used all of the time, and when they are used, vehicles will not necessarily travel in the typical peak times due to production schedules, we consider that a priority intersection with an auxiliary right-turn lane but no auxiliary left-turn lane will have suitable capacity.

Performance of Highway

With the addition of a further 370 vehicles in the peak hours onto the highway, the approach set out in the the Austroads Guide to Traffic Management Part 3 ('Traffic Studies and Analysis') show that Wanaka-Luggate Highway would provide Level of Service D. Although this is one step lower than current conditions, it remains within a zone of stable flow, albeit that there would be fewer opportunities for vehicles to pass and average speeds are likely to be a little lower.

Safety of Access Intersection

As set out previously, sightlines at the western access are currently excellent in each direction. We consider that there are no reasons why this would be different in future even with a widened seal.

The adjacent topography is not particularly challenging, meaning that there are no reasons why the layout of the access intersection cannot meet current design guides and standards in full.

Consequently we do not consider there are any reasons why any safety-related adverse effects would arise as a result of the proposal.

Internal Layout

Although this review has focussed on the external effects, we comment that the site itself is large and as such, we do not consider that there are any reasons why compliance with relevant District Plan transportation matters (such as the number and size of parking spaces, or layout of internal access roads) would not be achieved.

Conclusion

Based on our assessment, we consider that the existing western site access would be the more suitable for serving the development, at this is able to meet NZTA requirements for access spacing. However it should be upgraded with a right-turn lane, and the design should allow for a left-turn lane to be constructed in future. There are no reasons why the layout of the improved intersection would need to deviate from current design guides and standards.

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With the access intersection improved in this way, it is able to accommodate the traffic generation of the proposal without extensive delays to exiting (or entering) traffic. The highway is able to accommodate the increased traffic volume and remains in a zone of stable flow, although there would be some reduction in ability to overtake and in operating speeds. However there is no requirement for any widening of the highway (such as the addition of a second lane).

Sightlines for drivers are currently excellent meaning that there are no reasons why any safety-related adverse effects would arise as a result of the proposal, even when the access intersection is upgraded. The internal layout of the site is unlikely to have non-compliances with District Plan requirements due to the large size.

Consequently we confirm that there do not appear to be any transportation-related impediments to this project progressing. We therefore recommend that it is able to proceed to a more comprehensive assessment of effects.

Please do not hesitate to contact me if you require anything further or clarification of any issues.

Kind regards
Carriageway Consulting Limited

Andy Carr
Traffic Engineer | Director

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