



MEMO

TO: Tarryn Elverd, Yarra Ranges Council
FROM: Caroline Funnell, WSP Australia
SUBJECT: Warburton Mountain Bike Destination – Qualitative Air Quality Assessment
OUR REF: PS114527-AQ-MEM-001_EES Referral
DATE: 11 September 2019

1. INTRODUCTION

Yarra Ranges Shire Council (YRSC) has engaged WSP to undertake a qualitative air quality assessment for the proposed Warburton Mountain Bike Destination project. This memo focuses on the potential impacts on air quality from road traffic emissions contributed by the Project and specifically construction activity emissions and vehicle emissions during operation from visitor trips to the site compared to the existing conditions.

The Project is to be located on Damman's Road, which is a collector road, and will impact Mayer Bridge which feeds into Damman's Road from Warburton Highway (B380). This qualitative assessment addresses the potential future change in air quality from an increase in vehicular traffic due to the development of the mountain bike destination trail head and visitor car park (including shuttle bus services) located on Damman's Road in Warburton. Damman's Road will receive road traffic to and from the car park including visitors, staff and the proposed shuttle bus service which will take cyclists up to the top of Mt Donna Buang and Mt Tugwell trails. This assessment considers the predicted traffic network change at Mayer Bridge (Damman's Road) and Warburton Highway.

2. PROJECT DESCRIPTION

The Warburton Mountain Bike Destination project plans to construct a cycling trail head including a visitor car park and facilities located at Warburton Golf Club. The intention is that cyclists will travel via car and park near the golf course and will use the shuttle service at the trail head to access the mountain biking trails that will be developed at Mt Donna Buang and Mt Tugwell. The potential air quality impacts discussed in this document consider the increased traffic on Mayer Bridge (Damman's Road) as well as Warburton Highway near Mayer Bridge attributed to the project.

The Project includes:

- Development of a cycling trail head at Warburton Golf Club
- Expansion of the existing car park at the Warburton Golf Club including an additional access point
- Shuttle Bus service established consisting of 24 -30 trips per day
- Up to nine staff members to be located at the trail head during its operation.

The proposed area of assessment is indicated in Figure 2-1.



Figure 2-1 Project site and surrounding traffic network

The project involves the construction of a cycling trail head with facilities at the existing Warburton Golf Club. Cyclists will use this as a starting point from which to take a shuttle bus to Mt Donna Buang and Mt Tugwell. Estimates of the usage of the trail head, upon which this assessment is based includes:

- 2,700 cyclists per week to use the trails on 40 weeks of the year once operation is matured
- Highest visitors expected on weekends with approximately 675 cyclists per day and approximately 270 per day on week days at Years 6 – 12, increasing to 845 cyclists and 337 riders respectively at Years 13 – 20
- Large events may attract up to 2,000 visitors on one day but these would be infrequent
- 24 – 30 shuttle buses will operate daily (12 – 15 trips each to Mt Donna Buang and Mt Tugwell)
- 9 staff members stated at the trail head at any one time
- Operating hours will be from dawn to dusk.

3. EXISTING CONDITIONS

3.1.1 SENSITIVE RECEPTORS

The nearest sensitive receptors include residential properties on Damman’s Road and Warburton Highway and a number of hotels / bed and breakfast properties on Warburton Highway to the south and Martyr Road to the east.

Surrounding sensitive receptors were identified as:

- six residential properties on Damman’s Road immediately southwest of the proposed trail head car park
- eight residential properties to the south of the trail head on Warburton Highway
- Birchwood Manor Hotel and a residential property to the east on Martyr Road
- Alpine Retreat Hotel on Warburton Highway to the southeast.

3.1.2 EXISTING AIR QUALITY

The existing air quality within the study area is expected to be typical of a rural environment dominated by emissions from low volume traffic along Warburton Highway and the surrounding road network, with seasonal traffic peaks from tourist visitors to the area.

A review of the National Pollution Inventory (NPI) for 2017/2018 indicated no local industries reporting emissions in the Warburton area. The nearest registered facility is located at Yarra Junction – a saw mill operation over 5 kilometres (km) from the project and not expected to affect the local air environment.

The main sources of emissions contributing to the local air environment include:

- Traffic using the Warburton Highway and surrounding road network
- Managed forest burns
- Logging activities
- Agricultural activities
- Domestic fuel burning (gas, liquid and solid)
- Residential activities (e.g. lawn mowers and barbecues).

These sources give rise to emissions of the following key pollutants relevant to construction and operation of the project:

- total suspended particulates (TSP)
- particulate matter with an aerodynamic diameter of less than 10 microns (PM₁₀)
- particulate matter with an aerodynamic diameter of less than 2.5 microns (PM_{2.5})
- oxides of nitrogen (NO_x) comprising nitrogen dioxide (NO₂) and nitric oxide (NO)
- carbon monoxide (CO)
- air toxics (benzene, toluene, ethylbenzene and xylenes) and
- polycyclic aromatic hydrocarbons (PAHs).

These air pollutants are considered the principal emissions from vehicle traffic and mobile plant machinery associated with construction and operation of the project.

Ambient air quality monitoring data is not available for the study area. The nearest ambient air quality monitoring station (AAQMS) managed by the Environment Protection Authority (EPA) is located just outside Lilydale in Mooroolbark, a residential area with some light industry including a quarry nearby. This AAQMS is approximately 33 km east of the project. The Mooroolbark AAQMS measures PM₁₀ continuously, among other pollutants (PM_{2.5} and ozone). A review of the 24 hour PM₁₀ concentrations at the Mooroolbark AAQMS indicated compliance with the 50 µg/m³ State Environment Protection (Ambient Air Quality) Policy (SEPP[AAQ]) standard, with the highest concentration of 18.1 µg/m³ occurring in April 2017.

Given the urban location of the Mooroolbark AAQMS, ambient air quality at the project site is expected to be lower than this and below ambient air quality standards prescribed in the State Environment Protection (Ambient Air Quality) Policy (SEPP[AAQ]).

3.1.3 TOPOGRAPHY

The topography of the study area is characterised by the surrounding mountain ranges including Mt Donna Buang to the north of the trail head and Mt Tugwell to the south. The trail head and car parking facilities will be located in a valley between the mountains in the low-lying areas where Warburton township is located. The roads leading into the trail head car park are relatively flat running along the bottom of the valley, whilst it is acknowledged that shuttle buses travelling up to the peak of Mt Donna Buang and Mt Tugwell will experience high gradients.

Given its setting, Warburton may experience temperature inversions under certain meteorological conditions where the temperature increases with increasing altitude, impeding atmospheric mixing and causing air pollution at ground level.

3.1.4 METEOROLOGY

The study area is located in a temperate climate with warm to hot summers and cold winters. Annual average temperature is approximately 15°C and annual average rainfall of 254 millimetres.

4. IMPACT ASSESSMENT

4.1 CONSTRUCTION

During construction of the proposed trail head car park air emissions may be generated by the following activities:

- site clearance including earthworks for ground levelling
- construction of car park and trail head facilities e.g. toilets
- vehicle movements on paved and unpaved roads
- erosion of stockpiles and freshly exposed areas on-site
- handling, transfer and storage of materials
- movement of on-site machinery
- re-contouring of land and soil exposure for reseeded (landscaping around the trail head car park)
- combustion of fuel from HCV and mobile plant usage.

Effective on-site management measures implemented during construction would minimise air emissions.

4.2 OPERATION

Traffic data has been provided by the traffic consultant for daily average traffic volumes together with peak hour volumes on key road sections from Damman's Road over the Mayer Bridge on to Warburton Highway. The car park will be accessed from Damman's Road as per the existing access to the golf course.

Based on the trail head operational details provided in Section 2, with 677 cyclists on a Saturday or Sunday assuming all driving to the site, the peak visitor car parking demand is estimated at 237 car spaces should all visitors stay for a whole day, whilst part-day activities would result in 75% of the daily figure with 177 car spaces being required. The traffic impact assessment conducted by SALT³ (August 2019) therefore recommends a car park with at least 177 spaces is provided in the first instance plus accommodation of spaces for the golf course to be maintained. An overflow area for additional cars could also be provided.

Distribution of the additional traffic contribution from the project will predominantly effect Damman's Road which will include two access points to the car park, whilst the majority of traffic will then travel onto Mayer Bridge and split east and west (predominantly west towards Melbourne) on Warburton Highway.

The Mt Tugwell trail head is expected to generate 76 daily vehicle trips (two-way) on a Saturday and Sunday. This comprises of 30 shuttle bus trips per day on weekends and 46 car trips (cyclists driving to the trail head) on weekends. This is a low volume of traffic and comfortably accommodated on Old Warburton road, Mt Bride Road and Park Road. Consequently, air quality impacts along these roads would not be of significance.

4.2.1 DAILY VOLUMES – WITH PROJECT

The daily vehicle trips estimated for the project are calculated to be 474 based on a peak day user volume of 677 mountain bikers, the parking generation rate of 0.35 vehicles per user and multiplier by 2 trips (in and out) per vehicle.

4.2.2 PEAK HOUR VOLUMES – WITH PROJECT

Peak hour volumes are estimated to be 59 inbound and outbound vehicle movements at the critical Saturday afternoon peak hour. This is assumed that 25% of parking spaces will turn over and a peak parking demand of 237 spaces.

4.2.3 TRAFFIC VOLUME CHANGES

Traffic volumes have been determined for the existing traffic network based on surveys conducted by Salt³ in its report *Local Movement and Transport report – Warburton and Surrounds*¹ dated 5 February 2019 and *Warburton Mountain Bike Destination Project Proposed Trail Head – Traffic Impact Assessment*² dated 26 August 2019. The traffic volume changes are provided in Table 4-1.

Table 4-1 Predicted traffic volume changes with project

SECTION	DIRECTION	EXISTING (2018)		FUTURE (2027)		% TRAFFIC VOLUME CHANGE
		DAILY VEHICLES ¹	% HV	DAILY VEHICLES ²	% HV	
Warburton Highway, Warburton (near #3395)	East bound	3049	7.5	3875	7.5	27%
	West bound	2990	8.5	3800	8.5	27%
Mayer Bridge (Damman’s Road)	North bound	503	8.6	1052	8.6	109%
	South bound	554	2.8	1159	2.8	109%

1. *Local Movement and Transport report – Warburton and Surrounds 19 February 2019 – Appendix 2 “Traffic Speed and Volume Survey Results)*

2. *Local Movement and Transport report – Warburton and Surrounds 19 February 2019 – Table 8 “Forecasted Traffic Volumes in Warburton)*

The traffic volume predictions indicate that daily vehicles are expected to double on Mayer Bridge (Damman’s Road) by 2027, the majority of which will be attributable to traffic associated with the project through visitors and shuttle bus trips. This would likely result in minor increases in vehicular emissions given the estimated low traffic volumes, and minor impacts at the nearest sensitive receptors located approximately 50 metres (m) from the project.,

Traffic increases (27%) are predicted along Warburton Highway with the project proceeding. Given the relatively low volume of predicted future traffic (2027), air quality impacts from vehicular emissions are expected to be low at receptors further east and west of Mayer Bridge and not exceed relevant ambient air quality standards.

Air quality impacts are likely to be highest during peak AM and PM weekend periods with vehicular traffic travelling on the Warburton Highway, Damman’s Road and Mayer Bridge accessing the visitor’s car park. Given the relatively low predicted increases in traffic volumes during peak AM and PM periods (59 inbound and outbound movements), the short duration of peak emissions and its localised nature, air quality impacts are not expected to be of significance at the nearest sensitive receptors and should not exceed relevant ambient air quality standards.

During other week day and weekend periods, air emissions from vehicle traffic associated with the project, are expected to be lower and minor impacts at the nearest sensitive receptors.

It is therefore recommended that a more detailed air quality impact assessment is not required for the project.

¹ SALT³ (February 2019) Local Movement and Transport Report – Warburton and Surrounds.

² SALT³ (August 2019) Warburton Mountain Bike Destination, Proposed Trail Head – Traffic Impact Assessment.



4.3 MITIGATION MEASURES

During construction, an Air Quality Management Plan (AQMP) should be prepared for the project as part of the overall Construction Environmental Management Plan (CEMP). Best practice environmental management measures should be implemented to minimise particulate matter, odour and other air emissions at nearby sensitive receptor locations in accordance with relevant legislation and guidance. This may include activities such as water-spraying roads and areas of earthworks to limit particulate matter emissions.

Operational impacts can be reduced through the state and federal strategies including the adoption of more stringent fuel standards for vehicles, tighter exhaust emission standards, increased maintenance checks and emissions testing. Preparation of a Traffic Management Plan for special events will also be required to minimise excessive queueing, congestion and avoid accidents during peak visitor periods. This should help avoid a build-up of higher levels of vehicle emissions during a peak event along Damman's Road and Mayer Bridge to the car park.