

7.2 KENT ROAD SEPARATED BICYCLE LANE OPTIONS

Director City Futures, Kirsten Coster

City Change

Officer Recommendation

That Council:

1. Notes the six alternative design options and the evaluation assessment for the trial-separated bike lane designs for Kent Road, Pascoe Vale at Attachment 1 which responds to the specific Council resolution at its August 2021 meeting, noting:
 - a) The current design is considered, on balance a well-performing option suitable to continuation of a trial with minor amendments.
 - b) Option one (minimum width bi-directional separated bike lanes and physical separator) and option three (widening of the south side footpath to allow for bikes and footpath off road) meet design considerations but are not suitable for trial implementation as they require detailed design at the Cumberland Road roundabout including footpath realignment into the park and Department of Transport approval.
 - c) Option two (bike lanes max 1.2m with plastic bollards as separators) provides insufficient bike lane width and is considered unsafe for either a trial or permanent street-cross section design for Kent Road.
 - d) Option four (widening of the south side footpath to allow shared path) is considered unsafe for either a trial or permanent street-cross section design for Kent Road due to the inherent issues with shared paths.
 - e) Option five (similar to current trial but removes physical concrete separator and replaces with 0.8m plastic bollard treatment similar to Northumberland Road) is a minor adaptation to the current design which delivers improvements to pedestrian walkability, future street waste collection and marginal improvement to vehicle operating widths and turning circles for driveways.
 - f) Option six (removal of parking on southern side and reduction in width of physical separators) requires removal of on-street parking on the southern side of Kent Road and allocation of that road space to allow continuous two-way traffic flow in a low speed environment.
2. Undertakes community engagement on the current trial design, in addition to alternative design options one, three, five and six (see Attachment 1) as per Council's *Community Engagement Policy (2020)*.
3. Receives a report in late 2021/early 2022 including:
 - a) Findings from the community engagement on the current design, in addition to alternative design options one, three, five and six (see Attachment 1).
 - b) Research and data analysis during the intervening period on cycling uptake, changes in vehicle speeds and volume, traffic incident reports and parking assessments
 - c) Recommendations to Council for the remainder of the trial period.
 - d) Recommendations to Council for consultation on future bike lane projects based on outcomes from proposed Kent Road community engagement process

4. During the intervening period of engaging the community with the various bike lane options, continue to make alterations on the Kent Road bike trial in response to observations and feedback including:
 - a) Review turning movements at individual driveways to ensure residents can drive in and out of their driveways along Kent Road adequately.
 - b) Consult with the owners and occupiers of Kent Road between Cornwall Road and Cumberland Road to gauge support a parking ban during the trial period on the southern side of Kent Road either all day or during waste collection on Wednesday (5am to 12 noon).
5. Delegates approval to the Director City Futures for parking restriction modifications on Kent and Northumberland Roads (Pascoe Vale) and Dawson Street, Brunswick (and immediately surrounding streets) to address any identified issues during the trial period only.
6. Notes that a zebra crossing (including potential raised platform) on Kent Road (immediately east of Joffre Street) will to be considered as part of all bike options and will be reported back to Council with the recommendation on how to proceed with bike lanes on Kent Road. Council also notes that Department of Transport approval will be required.

REPORT

Executive Summary

Investment in separated and safe cycling infrastructure encourages people of all confidence levels to start riding bikes.

In June 2021, Council installed trial-separated bicycle lanes in Kent Road and Northumberland Road, Pascoe Vale. A new shared path in KW Joyce Reserve links these two bicycle lanes.

Kent Road was nominated for the trial because it is a critical missing part of the Coburg to Glenroy Bicycle Link. This section of Kent Road will also connect to bicycle lanes being funded by the Victorian Government on the eastern section of Kent Road as well as Derby Street.

Since installation, Council has received wide-ranging feedback from the community, including:

- Narrowness of road resulting from the design option and subsequent changes traffic conditions
- Concern and transparency about community consultation process
- Support for design of protected cycle lanes,
- Access, safety and parking issues resulting from the design option and subsequent changes traffic conditions
- Desire to fulfil Council's commitment for a 12-month trial of separated bike lanes
- Investigation of a pedestrian crossing on Kent Road.

At the August 2021 meeting (8.1) Council resolved to receive a report at the September 2021 meeting, investigating how to continue the Kent Road trial using alternative design options.

Council officers prepared alternative designs with consideration of:

- The role and function of Kent Road as a Local Street

- Reduced impact to vehicle flow whilst ensuring appropriate design standards for Local Streets including bike lane design, physical separation, shared paths, vehicle carriageway, safety perceptions and operational and implementation considerations
- Changes to cross-section design treatments that could address community feedback

Council officers have prepared six alternative designs and evaluated these against the above considerations. These options are detailed in Attachment 1 with key evaluation points as follows:

- Shared paths are not the preferred design intervention when trying to encourage cycling. One of the most common complaints Council receives from cyclists and pedestrians is the conflict that occurs on shared paths as bike riders tend to travel at much faster speeds than pedestrians, making it an uncomfortable experience to walk on a path. Separated bicycle lanes are the preferred, on-street design treatment for Moreland as they reduce conflict between pedestrians and cyclists.
- Due to limited space a bi-direction bicycle lane approaching the roundabout is not possible during the trial period. A detailed design will need to be undertaken to understand the options. Please note that space is limited on the south eastern corner of the intersection and will affect if/what designs are possible. The design would need to accommodate cyclists exiting the road, sufficient space for both pedestrians and cyclists to cross Cumberland Road, and maintain a roundabout that can accommodate the existing bus route. Footpath and kerb alignments would need to change and all approaches to the roundabout will need to be reviewed

It is recommended that Council undertakes engagement with the community on the current trial plus alternative design options one, three, five and six (see **Attachment 1**) as per Council's Community Engagement Policy (2020). Changing the design significantly without undertaking community engagement risks further compounding the community's perceptions of:

- Lack of transparency about the rationale for the trial-separated bike lanes
- Lack of engagement in the design process
- Concerns about frayed community relations
- Mistrust

The outcomes of the community engagement will be reported to Council in late 2021/early 2022 with recommendations on next steps for this trial.

During the intervening period, Council will continue to make alterations on the Kent Road bike trial in response to observations and feedback including:

- Review turning movements at individual driveways to ensure residents can drive in and out of their driveways along Kent Road adequately. Changes to parking to allow for these types of manoeuvres can be done quickly throughout the trial if delegation is provided to Director to City Futures.
- Consult with the owners and occupiers of Kent Road between Cornwall Road and Cumberland Road to gauge support a parking ban during the trial period on the southern side of Kent Road either all day or during waste collection on Wednesday (5am to 12 noon).

Officers propose that Council receives a report in late 2021/early 2022 including:

- Findings from the community engagement on the current design, in addition to alternative design options one, three, five and six (see Attachment 1).
- Research and data analysis during the intervening period on cycling uptake, changes in vehicle speeds and volume, traffic incident reports and parking assessments
- Recommendations to Council for the remaining six months of the trial period.

- Recommendations to Council for consultation on future bike lane projects based on outcomes from proposed Kent Road community engagement process

Previous Council Decisions

Dedicated Bicycle Lanes on Kent Road and Northumberland Road, Pascoe Vale

(Notice of Motion) - 11 August 2021

1. *Notes that some members of the community do not feel that sufficient consultation has occurred with regard to some of Moreland's recent, temporary, pop-up bike lanes, particularly on Kent Road, Pascoe Vale.*
2. *Notes that community members and the Pascoe Vale Medical Centre have identified a number of access, safety and parking issues on Kent Road since the installation of the temporary bike lanes.*
3. *Notes that a common theme of the community feedback is that the current bike lane design on Kent Road makes the road too narrow for motorists to pass each other and to park their cars.*
4. *Notes the purpose of the below, potential design changes at point 8a) are intended to:*
 - a) *Give back more road space to motorists in light of the feedback received by some residents*
 - b) *maintain physically separated infrastructure for residents who ride bikes*
 - c) *allow for easier parking and access to homes, the Pascoe Vale Medical Centre, and Cole Reserve*
5. *Notes that Kent Road and Northumberland Road are identified in Council's 10 Year Bicycle and Pedestrian Plan as strategic cycling corridors.*
6. *Notes the need to provide physically separated cycling infrastructure to encourage people of all ages and abilities to ride a bike, whilst also maintaining a safe road network.*
7. *Notes the recent Monash University and VicHealth survey (2020) study showing 83% of Moreland residents would ride a bike more often if they had safe, physically separated infrastructure to use.*
8. *Receives a report at its September 2021 meeting, investigating how to continue the Kent Road trial using alternative design options that retain physically separated cycling infrastructure to keep residents on bikes safe, as well as providing more road space to motorists in light of concerns raised by some residents. Council officers should investigate options such as:*
 - a) *Bi-directional bike lanes involving the removal of one of the physically separated bike lanes on Kent Road and replacing with a consolidated, bi-directional bike lane on the opposite side of the road. One option would involve the removal of the existing bike lane on the north side of Kent Road and the installation of a bi-directional bike lane on the south side of the road.*
 - b) *allowing removal of all concrete barriers on Kent Road and replace with plastic bollards on the south side only and the bike width lane should not exceed 1.2 metres.*
 - c) *widening of the south side footpath on Kent Rd for example up to 1.8 metres to allow for bike lanes and pedestrian footpath that would be similar to what we have on Rhodes Parade, Oak Park, the continuation of Boundary Road, Pascoe Vale.*
 - d) *Investigate the installation of a pedestrian crossing on Kent Rd opposite Cole Reserve.*
 - e) *the option of a shared path for cyclists and pedestrians on the southern side of Kent Rd*

- f) *Include recommendations for improving the consultation process for future projects involving separated bike lanes.*

Safe Movement of Pedestrians and Cyclists - Covid-19 Response 8 July 2020

That Council:

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- 4. *Approves the following projects as described in this report to be delivered as soon as possible, subject to external/grant funding being secured.*
 - i. *An expanded zebra crossing program (up to \$500,000);*
 - ii. *An expanded pedestrian threshold program (up to \$500,000);*
 - iii. *Pop up separated bicycle lanes on Dawson Street, Brunswick between the Upfield shared path and Barry Street (\$105,000);*
 - iv. *Pop up shared zones on Albert Street and Victoria Street in Brunswick East at the Fleming Park shared path (\$150,000);*
 - v. *Pop up separated bicycle lanes on Kent Road, Pascoe Vale, between Cornwall Road and Cumberland Road (\$60,000);*
 - vi. *Pop up separated bicycle lanes on Northumberland Road, Pascoe Vale between Rhodes Parade and the KW Joyce Reserve shared path (\$66,000);*

Moreland's Transport Response to COVID-19 and Social Distancing Requirements (Notice of Motion) - 13 May 2020

That Council:

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- 5. *Receives a report at the July Council meeting detailing further opportunities to support safe movement for pedestrians and cyclists during the COVID-19 state of emergency including:*
 - a) *Opportunities to repurpose car parking to support safe pedestrian or cyclist movements;*
 - b) *Locations for trials of 30km/h speed limits on local roads, as per MITS 2019;*
 - c) *Pedestrian and cycling improvements that could be delivered in the short term.*

Moreland Integrated Transport Strategy - Review - 9 December 2020

That Council:

- 1. *Reaffirms the objective of mode shift to more sustainable transport options, noting that this requires strong investment in public transport, cycling, walking and other sustainable transport infrastructure, as well as incentives and encouragements to take up sustainable transport.*
- 2. *Recognises that using sustainable alternatives to driving is difficult for many in Moreland, partly due to lack of investment in the public transport system by the state government, particularly in the North of Moreland.*

1. Policy Context

Moreland Integrated Transport Strategy (2019)

The Moreland Integrated Transport Strategy (MITS) 2019 is Council's overarching transport strategy to achieve a demonstrable mode-shift towards sustainable transport alternatives. The strategy includes actions which commit Council to:

- Reallocate road space and car parking according to the road user hierarchy (in descending order, pedestrians, cyclists, public transport users and motorists).
 - Work together with state government to, among other things:
 - Continue to implement 40km/h speed limits on local roads
 - Install direct, safe and convenient crossings where lots of pedestrians and cyclists want to cross, even where VicRoads warrants aren't met
 - Increase pedestrian and cyclist priority at signals and crossings.

Community Engagement Policy (2020)

Council has recently adopted a new Community Engagement Policy (2020) to align with the new Local Government Act 2020. It sets directions for how Council will engage with the community on decisions that impact them, including future bicycle and pedestrian projects.

Urban Heat Island Effect Action Plan (2016)

In 2016 Council adopted the Urban Heat Island Effect Action Plan to create a city more resilient to urban heat and climate change. Protecting and enhancing tree canopy cover and green spaces are important considerations for future bicycle and pedestrian projects

Zero Carbon Moreland (2018)

Council's Zero Carbon Moreland 2040 Framework outlines our community vision and strategic directions for the transition to zero carbon in Moreland by 2040. In 2019/20, transport was recorded to contribute 17 per cent of all carbon emissions in the Moreland local government area, 13 per cent were from private motor vehicles. The 2040 vision for Sustainable Transport includes:

- Most people choose to walk or cycle to get around locally because its healthy, free, safe and convenient
- Moreland is known for its pedestrian and cycle-friendly streetscapes

This overarching Framework informed 5-yearly action plans to drive the transition to zero emissions including:

- Investing in infrastructure to support active travel and public transport
- Reallocate space used for private vehicle travel and parking to support sustainable transport use and other purposes.

2. Background

Why Moreland needs more separated and safe bicycle lanes

During the Victorian Covid-19 pandemic, an increase in people using local walking tracks and cycling paths, alongside reduced public transport capacity, prompted the Council to invest an additional \$1.68 million in transport improvements in the 2020/21 budget.

Recent research by Monash University and VicHealth indicates 83 per cent of people in Moreland are “interested in cycling but concerned”. These are people who would consider cycling as an option in some instances but are often afraid to do so if required to ride close to vehicles and pedestrians.

Investment in separated and safe cycling infrastructure is likely to encourage these people to start riding bikes. A similar trend is observed in Brunswick as infrastructure investments by Council 15-20 years ago continue to lead to increased participation in cycling. From 2011 to 2016, journey to work data indicates that cycling increased from 9.3 per cent to 12.1 per cent respectively (source: Australian Bureau of Statistics, Census data, 2011 and 2016). Brunswick has the highest journey to work cycling rate in Victoria.

Council endorsed the projects not proposing to conduct full public consultation prior to delivering projects as a means to deliver them more quickly than normal. Rather, Council aimed to implement these projects using temporary treatments that can be modified or removed if necessary and undertake engagement and consultation during the trial.

Strategic rationale for a protected cycle corridor on Kent Road

In June 2021, Council installed trial-separated bicycle lanes in Kent Road and Northumberland Road, Pascoe Vale. A new shared path in KW Joyce Reserve links these two bicycle lanes.

Kent Road was nominated for the trial because it is a critical missing part of the Coburg to Glenroy Bicycle Link. This section of Kent Road will also connect to bicycle lanes being funded by the Victorian Government on the eastern section of Kent Road as well as Derby Street.

There have been three crashes in the recent 5-year period (01/01/2016 to 31/12/2020) on Kent Road at the roundabout with Cumberland Road with two involving bikes being hit by vehicles.

Protected bicycle lanes are a necessary treatment to help address bicycle safety issues in the area and to encourage this vulnerable transport user group to feel safe to cycle. The Coburg to Glenroy Link is envisioned to be a protected, connected, safe and efficient cycling route suitable for cyclists of all confidence levels. In addition to providing a high-quality link between the two activity centres, it also connects destinations such as shops, schools, open spaces and community facilities along the way.

Community feedback to date

Since the installation of the infrastructure Council has been seeking feedback from the community, to better understand how the trial is working within the local environment, and to gather feedback about concerns and ideas for improvement.

Based on this feedback and further review by officers, Council has been addressing feedback including:

- Repairing the travel path for cyclists by removing potholes and cracks
- Installed “No Stopping” areas where vehicles can pull in to allow oncoming vehicles to pass
- Removing “No Stopping” areas on Cumberland Road just south of Kent Road, creating between 16 and 18 new on-street parking spaces.
- installing 2-3 disabled parking bays immediately outside the medical centre on Joffre Street, and 5 min restrictions signs, for drop offs near the medical centre,

Additionally, Council officers have requested a speed limit reduction with the Department of Transport on the bike trial roads (Kent Road, Northumberland Road and Dawson Street) from existing speeds, down to 40km/h, for the duration of the trials.

Council has also received further wide-ranging feedback from the community, which is considered as part of this report under “Section 3: Issues, including:

- Narrowness of road resulting from the design option and subsequent changes traffic conditions
- Concern and transparency about community consultation process
- Support for design of protected cycle lanes,
- Access, safety and parking issues resulting from the design option and subsequent changes traffic conditions
- Desire to fulfil Council’s commitment for a 12-month trial of separated bike lanes
- Investigation of a pedestrian crossing on Kent Road.

3. Issues

At the August 2021 Council meeting (8.1) Council resolved to receive a report at the September 2021 meeting, investigating how to continue the Kent Road trial using alternative design options that retain physically separated cycling infrastructure to keep residents on bikes safe, as well as providing more road space to motorists in light of concerns raised by some residents.

Key matters informing the officer recommendation are discussed below.

Street classification

Kent Road (west of Cumberland Road) is classified as a Local Street in Moreland’s Integrated Transport Strategy (MITS). The function of Local Streets is to “provide access to and from adjacent properties. They should prioritise pedestrian and cyclist amenity and safety and support local bus movements, where they are present. Prior to June 2021, as shown in Council’s traffic data collection from December 2020, 85 per cent of vehicles were travelling at an average of 46.7km/h (in both directions).

Pedestrians and bike riders are vulnerable road users. Prior to June 2021, Kent Road was not considered a safe and comfortable road for cyclists and pedestrians. As an example, the impact force of a vehicle colliding with a pedestrian (or cyclist) at 30 kilometres per hour is enough to be fatal, with the risk of injury or death rapidly increasing with higher speeds. Creating a safe and comfortable environment aligns with Council aspirations for this local street.

There are many mechanisms and design interventions available to establish a safe and comfortable environment for vulnerable road users (such as pedestrians and bike riders), including speed reduction measures, traffic management and infrastructure improvements.

Design considerations

a. Bike lane design

Like all modes of transport, there are operating requirements to be met for cycling infrastructure. Bike riding operational requirements have been developed by Austroads and other agencies and been in use for many years.

Figure 1 is an example of an Austroads envelope that provides the minimum bike riding space requirements to aid designers. The minimum desirable standard for a bike rider is 1.5 metres, this takes into consideration:

- The stationary width occupied by the bicycle and rider approximately 0.75 metres. Some bicycles, such as cargo-bikes have larger baskets and platforms for carrying larger loads, these tend to be approximately 1.0m wide.
- The dynamic width, which considers the fact that cyclists in motion deviate from a straight line, especially at low speeds between 0.2 metres and 0.8 metres.

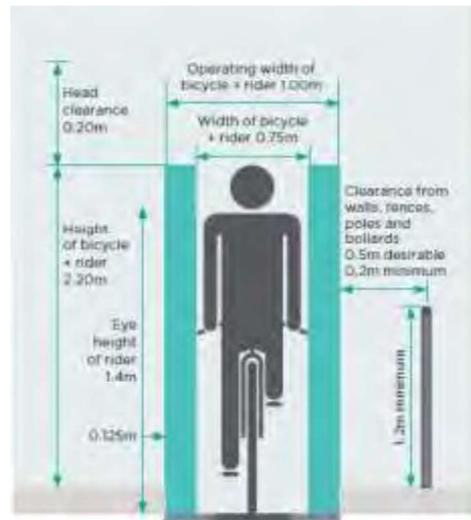


Figure 1: Bike lane design operating standards. Source: City of Melbourne, Bike Lane Design Guidelines, 2019.

Bi-directional cycle lanes offer some design efficiencies compared to single direction lanes. A trial-separated bi-directional bike lane can be 2.6m wide (1.3m in each direction).

b. Physical separation

Separation from moving and parked vehicles is an important consideration for vulnerable bike riders when considering ‘how safe’ it is to ride a bike.

Separation from vehicles and bikes is also an important consideration for pedestrian safety. Shared paths (between cyclists and pedestrians) and crossing of high-speed roads are points of conflict and unsafe for pedestrians.

Physical barriers and dedicated road-space are design interventions that improve the safety of these vulnerable user groups in the current design of Kent Road.

Temporary traffic bollards have been used in Northumberland Avenue, Pascoe Vale. Some community feedback to date has indicated these barriers can create a visual impact for local residents. Raised kerb barriers have a lower profile and are filled with gravel.

Different design standards for physical barriers are applicable to different road environments as follows:

Table 1: Design requirements for physical barriers (Source: City of Melbourne, Bike Lane Design Guidelines, 2019)

Road environment	Design requirements	
Adjacent to on-street parking*	0.8m to 1.0m raised kerb barrier	0.8m to 1.0m painted marking with temporary traffic bollard
Adjacent to vehicle lane (no on-street parking)	0.4m to 1.0m raised kerb barrier	0.4m to 1.0m painted marking with temporary traffic bollard

*A wider barrier is required adjacent to on-street parking as there is an inherent risk of ‘car dooring’, see figure 2 below



Figure 2: example of 'car dooring' into a bike lane and cyclists pass. Source: City of Melbourne, Bike Lane Design Guidelines, 2019.

c. Shared paths

Shared paths are typically not the preferred design intervention. One of the most common complaints Council receives from cyclists and pedestrians is the conflict that occurs on shared paths as bike riders tend to travel at much faster speeds than pedestrians, making it an uncomfortable experience to walk on a path. Separated bicycle lanes are the preferred, on-street design treatment for Moreland as they reduce conflict between pedestrians and cyclists.

Delivering separated bicycle lanes also aligns with a list of Council endorsed positions including Moreland Integrated Transport Strategy (MITS), Urban Heat Island Policy, Zero Carbon Moreland 2040 Framework, and the Climate Emergency Action Plan. These policies highlight the importance to promote sustainable transport, increase green spaces, and reduce hard surfaces (e.g. concrete and asphalt).

In off-street locations such as parks, shared paths are still preferred as it reduces the amount of green space removed, and most pedestrians do not need to walk on the path as they have access to alternative paths including grassed areas.

A shared path in Kent Road or Northumberland Road would remove significant trees and green space, create more hard surfaces and require relocation of utility poles. This scale of works is not considered practical for a trial intervention due to cost, time and permanency of capital works. Relocation of utility poles could increase the cost of the project over \$1,000,000 and require approvals with utility providers.

d. Reducing width of vehicle carriageway

Prior to July 2021, the vehicle carriageway on Kent Road was approximately 12.0m wide, including parking. The available space to moving vehicles was comparable to the space afforded to cars in high-speed environments such as arterial roads and highways, where vehicles travel 'through' an area and cyclists and pedestrians are usually not encouraged.

Vehicle lane widths throughout the municipality vary. However, design considerations for moving vehicles on Local Streets such as Kent Road are as follows:

Table 2: Vehicle lane widths on Local Streets

Road environment	Vehicle lane widths	
	Minimum	Maximum
One-way flow	3.0m	3.5m
Two-way flow	2.8m each way (low speed and low volume)	3.5m each way (high volume, bus route or heavy vehicles using route)
Pull-in/passing spots are needed	3.0m minimum	5.6m (road travel lanes equal to or greater than 5.6m, 2.8m each way, do not require pull-in/passing spots)

Road safety

Improving road safety for all users is the highest priority when undertaking works within the road reserve. Measured risk is how risk is calculated and assessed. Perceived risk is how a person reacts to and feels in different conditions. It is important to highlight the difference between measured risk and perceived risk and note that both are important especially when the aim is to encourage people to use different modes of sustainable transport they have previously felt unsafe or concerned to use.

a. Measured risk

Measured risk is a technical methodology that calculates the risk level by undertaking a Road Safety Audit (RSA).

An RSA is always completed by a qualified and accredited RSA team, and can be done at any stage of the project depending on the complexity. For the trial bicycle lanes, RSAs were completed at the design stage and after the works were completed (during both daytime and night time conditions).

For Kent Road, an RSA was completed January 2021 during the design stage, and another post construction July 2021. Please refer to **Attachment 2** and **Attachment 3** for a copy of the reports. The findings and actions for both Kent Road RSA are summarised below:

- The cracks in the bicycle lanes were the only high-risk item which were known by Council prior to the audit. The cracks have now been repaired.
- The 'changed traffic conditions' signage was recommended, however the particular signage is not appropriate as it is not appropriate to mounting on a pole. A request has been made for Council's sign manufacture to create a custom sign that can be mounted on a pole. The works are expected to be completed in the coming weeks.
- The risk of a cyclist being hit by a driver turning into a driveway is considered a low risk. All driveways would be used almost exclusively by the people who would be aware of the bicycle lane. As such, it is not recommended to ban additional parking spaces near driveways at this time.

The current Kent Road design addresses the necessary changes following the audit and risk of an injury crash is low.

The review of crash data is another tool to evaluate potential issues. The majority of crashes are caused by someone making a mistake. A crash does not automatically show that there is a potential risk or something needs to change.

Though pedestrian safety is one concern raised during the trial, pedestrian safety for people crossing has been improved in the current design of Kent Road. Prior to June 2021, pedestrians were crossing a 12-metre wide road between parked vehicles and had to negotiate faster moving vehicles across two traffic lanes. The current design of Kent Road reduces the distance needing to cross at time, and the granitic sand refuge islands provide a similar type of surface as a nature strip.

The only additional risk is that pedestrians exiting from the driver's side of a vehicle need to look for traffic coming from both directions (however this is typical for most streets in Moreland). The narrower vehicle lane means vehicles will necessarily slow down to navigate the street, this in turn will lead to a safer environment for people to exit their vehicles or cross the street.

Further details of proposed improvements to pedestrian infrastructure is outlined in "Pedestrian Crossing on Kent Road".

b. Perceived risk

The perception of risk is how a person feels when using the road network. People's perceptions of risk vary, and it is important to understand the range of differing views that people have when they are a pedestrian, bike rider or in a vehicle. A trial is a great method for understanding perceived risks as people get to give genuine reactions rather than hypothetical.

Risk perception is important to analyse as it affects how people behave.

While driving, an increased perception of risk (feeling something is unsafe or feeling cautious) heightens the drivers awareness and result in driving behaviour to match the conditions. For example, slowing down to give way to oncoming vehicles or to look out for pedestrians. Over confidence or complacency are factors that can result in people making mistakes that cause a crash.

Perception of risk can stop people choosing to walk or ride a bicycle. Vulnerable road users (pedestrians and cyclists) are at a greater risk of being injured if involved in a crash, so are unlikely to choose to walk or ride if they feel unsafe.

The current Kent Road design encourages drivers to travel with more caution and at a slower speed. Vulnerable road users (pedestrian and bike riders) are more likely to choose a sustainable transport option as the road is designed to improve their safety.

Cumberland Road roundabout

Due to limited space a bi-direction bicycle lane approaching the roundabout is not possible during the trial period. A detailed design will need to be undertaken to understand the options. Please note that space is limited on the south eastern corner of the intersection and will affect if/what designs are possible.

The design would need to accommodate cyclists exiting the road, sufficient space for both pedestrians and cyclists to cross Cumberland Road, and maintain a roundabout that can accommodate the existing bus route. Footpath and kerb alignments would need to change and all approaches to the roundabout will need to be reviewed.

Cumberland Road is a state arterial road. This means that approval for any works related to this road or roundabout require approval and detailed design consideration with the Victorian Government's Department of Transport (DoT). Due to the complexities of intersection design and approvals process, changes to Cumberland Road will exceed the short-term intent of a trial-separated bike lane for Kent Road.

Several alternative design options outlined below will require detailed design and approvals process with DoT. While these will be possible for a permanent design, it is not supported by Council officers for implementation as a trial design process due to time and resource constraints.

The current design for Kent Road did not require approval with DoT as the works were contained solely within a local council road (Kent Road).

Alternative design solutions

In August 2021, Council resolved to receive a report at its September 2021 meeting, investigating how to continue the Kent Road trial using alternative design options for Kent Road. Alternative design options are detailed in **Attachment 1**, they include:

Option	Description
Current Design	Separated bicycle lanes with raised physical barrier
Option 1	Bi-directional, 2.6m cycle lane on southern side. Removal of northern physical barrier. Reduction of southern barrier to 0.8m. Reallocation of 1.4m to driving lanes. This is slightly less than the existing vehicle carriage way of Kent Road east of Cumberland Road (8.6m here vs 9.0m on average for Kent Road east of Cumberland Road).
Option 2	Removal of northern physical barrier. Reduction of southern physical barrier to 0.8m. Bi-directional, 2.4m cycle lane on southern side (insufficient operating width). Reallocation of 1.6m to driving lanes. This is slightly less than the existing vehicle carriage way of Kent Road east of Cumberland Road (8.8m here vs 9.0m on average for Kent Road east of Cumberland Road).
Option 3	Bi-directional, 2.6m cycle lane and 1.5m footpath on south side. Reduction of physical barrier to 0.8m. Removal of northern physical separator. 9.8m road carriageway facilitating two-way vehicle movement and parked cars. Significant civil works to relocate southern curb alignment and utility poles. Removal of trees on southern side. Detailed design required.
Option 4	Bi-directional, 2.6m shared path. Removal of all physical barriers. Vehicle carriageway returned to pre-June 2021 conditions. Significant civil works to relocate utility poles. Removal of trees on southern side. Detailed design required.
Option 5	Reduction of physical separators to 0.8m. Reallocation of 0.2m to vehicle carriageway. Trial of temporary traffic bollards and painted lines as physical separator to improve walkability.
Option 6	Removal of parking on southern side. Reduction of northern physical separator to 0.8m. Reduction of southern physical separator on southern side to 0.4m. Reallocation of 0.6m to vehicle carriageway.

a. Evaluation of alternative designs

An evaluation of each design option was undertaken against cycling, vehicle, pedestrian and implementation and operation criteria. The criteria were identified through community feedback, alignment with policy, alignment with design standards or pertaining to practical implementation and operational considerations.

Each design option was assessed against the criteria and allocated a ranking as one of the following:

- **High** – Achieves a positive outcome from the perspective of the user group or requires minimal change to implement
- **Moderate** – Achieves a compromised outcome from the perspective of the user group or requires some change
- **Poor** – Achieves a negative outcome from the perspective of the user group or requires significant change
- **Very poor** – Achieves an unsafe outcome from the perspective of the user group or requires significant and impractical change to implement. Unsafe outcomes are not supported by council officers.

b. Outcome of evaluation

- The evaluation assessment identifies the current design is considered, on balance, a well-performing option.
- Option one (minimum width bi-directional separated bike lanes and physical separator) and option three (widening of the south side footpath to allow for bikes and footpath off road) meet design considerations but are not suitable for trial implementation as they require detailed design at the Cumberland Road roundabout including footpath realignment into the park and Department of Transport approval. Options one and three may be considered for future, permanent design treatments beyond the trial period. It is recommended that officers engage with the community on these designs before any significant works are planned and undertaken.
- Option two (bike lanes max 1.2m with plastic bollards as separators) provides insufficient bike lane width and is considered an unsafe street-cross section design for Kent Road. It is not supported by officers for either a trial or permanent implementation.
- Option four (widening of the south side footpath to allow shared path) is considered an unsafe outcome for pedestrian and cyclist safety and is not supported by officers for either a trial or permanent street cross-section design for Kent Road
- Option five (similar to current trial but removes physical concrete separator and replaces with 0.8m plastic bollard treatment similar to Northumberland Road) is a minor adaptation to the current design which delivers improvements to pedestrian walkability, future street waste collection and marginal improvement to vehicle operating widths and turning circles for driveways.
- Option six (removal of parking on southern side and reduction in width of physical separators) requires removal of on-street parking on the southern side of Kent Road and allocation of that road space to allow continuous two-way traffic flow in a low speed environment.

Pedestrian crossing on Kent Road

The August 2021 resolution requested an investigation into a pedestrian crossing on Kent Road near Cole Reserve.

None of the trial-separated bike lane designs outlined in **Attachment 1** preclude a future pedestrian crossing.

Once Council resolves the design of the trial-separated bike lane for Kent Road (see **Attachment 1**), Council officers can design a pedestrian crossing within proximity to Joffre Road (shown in blue in figure 4 below).



Figure 4: indicative location of pedestrian crossing immediately east of Joffre Road

The pedestrian crossing options include a zebra crossing with flashing lights (potentially on a raised platform). A zebra crossing with flashing lights is recommended at this location due to lower pedestrian and traffic volumes on Kent Road.

The design will need to consider sight lines, existing street trees, minimising the loss of any further parking, drainage, underground services and cost implications. The final design will also need to match with the ultimate design for Kent Road and will then need to be approved by the Department of Transport.

Climate emergency and environmental sustainability implications

Transport accounts for more than one third of an average household's carbon emissions in Moreland, and almost one fifth of overall carbon gas emissions in Victoria and Australia. Supporting safe, efficient and accessible alternatives for private vehicle trips will significantly contribute to reduced emissions and halt the impact of global warming on future generations.

A trial-separated bike lane on Kent Road will encourage a shift away from reliance on privately-owned fossil-fuelled vehicles and support a long-term vision of public transport and mobility services using shared vehicles powered by 100% renewable energy, as well as an increased uptake of active travel.

Legal and risk considerations

a. RSA's

A road safety audit must be carried out on any alternative cross-section design. This may result in future changes.

b. Council decision without consultation

Community feedback to date has identified that proactive and programmed community engagement is required on complex projects, such as the Kent Road trail-separated bike lane. Officers recommend Council undertakes engagement with the community on the alternative designs (see **Attachment 1**) as per Council's *Community Engagement Policy (2020)* for complex matters affecting multiple people with competing needs, interests and levels of rank, power and influence; to find an outcome that delivers equitable benefits. The outcomes of the community engagement will inform the recommended bicycle solution for Kent Road for Council's consideration at the July 2022 Council meeting.

It is recommended that Council undertakes engagement with the community on the alternative design options one, three, five and six (see Attachment 1) as per Council's *Community Engagement Policy (2020)*. Changing the design

significantly without undertaking community engagement risks further compounding the community's perceptions of:

- Lack of transparency about the rationale for the trial-separated bike lanes
- Lack of engagement in the design process
- Concerns about frayed community relations
- Mistrust.

The outcomes of the community engagement will be included in the report to Council in late 2021/early 2022.

Human Rights Consideration

The implications of this report have been assessed in accordance with the requirements of the Charter of Human Rights and Responsibilities.

Key sections in the Charter that are relevant to this report are recognition and equality before the law (section 8), freedom of movement (section 12) and taking part in public life (section 18).

The majority of the actions proposed in this report contribute positively to freedom of movement by making walking and cycling safer and more attractive as modes of transport.

Some actions, such as removal of car parking may impact on freedom of movement for car users. In addition, any impact is significantly outweighed by the benefits to safety and helping to improve walking and cycling as transport options.

Removal of car parking presents a more significant issue, particularly where parking occupancy is high and a reduction in the number of spaces may make it more difficult for a person to find a space. Changes to parking will occur through due process including consultation with the community and survey of parking requirements. In addition, no proposed action entails removal of a disability parking space.

Option 6 reduces the number of parking spaces in an area that has relatively high occupancy and demand for parking at certain times of the week. This would have a more significant impact on freedom of movement for people who rely on the car to travel to the area, Council have recently reviewed the parking restrictions in the area. An additional 16-18 parking spots have been made available on Cumberland Road, south of Kent Road adjacent to the open space. This is a net-increase on the available parking compared to available spaces prior to June-2021.

It is considered that this impact on this right is justified by the positive impact on freedom of movement and safety for people cycling in the area. The proposal already minimises the reduction in car parking spaces as much as possible, and there is no alternative way to achieve this benefit without removing some car parking. As such, it is considered that the right to freedom of movement has not been unreasonably limited in this instance.

4. Community consultation and engagement

Consultation process to date for the Kent Road trial-separated bike lanes

In July 2020 Council endorsed the "Safe Movement of Pedestrians and Cyclists - COVID-19 Response" (DCF26/20) report with the knowledge that Council was not proposing "*to conduct full public consultation prior to delivering projects such as pop up separated bicycle lanes due to the need to deliver projects quickly to respond to COVID-19 and because these projects will be delivered using temporary treatments that can be modified or removed if necessary.*"

Following installation of the trial bicycle lanes in June 2021 an external engagement specialist was engaged in the first week in July 2021 to lead a community engagement program designed to:

- provide information and context to community on the strategic principles and goals, data/evidence and traffic engineering rationale for the bike lane trials.
- seek feedback on the immediate benefits and impacts on community, particularly in respect to things Council might be able to respond to quickly.

Plans were made to run four large pop up events in July and August 2021 as well as some smaller, focussed community walks between the pop ups.

Unfortunately, the outbreak of COVID-19 in Victoria, resulting in lockdown 5.0 and 6.0 meant that this type of engagement was not possible. The team worked to 'pivot' the pop-up engagement into a greater number of the smaller walks and conducted three of those walks in person, and the remaining three online before the State was locked down again.

Feedback informing the design options assessment

Community feedback to date has been mixed, with many in complete support of the trial continuing and many in support of removing the lanes altogether. There were many modification ideas or recommendations made to Council for further investigation. They include:

- remove the on-street parking on the south side of the road
- reroute the lanes down the (western, if possible) edge/s of Cole Reserve
- replace the two single direction bike lanes with a single dual carriageway lane (like in Northumberland Rd)
- reduce the speed limit to 40km/hr
- install an east-west cyclist and pedestrian crossing across Cornwall Rd, linking Kent Rd and the KW Joyce Reserve shared path
- install a north-south pedestrian crossing across Kent Rd near Cole Reserve

Feedback informing future consultation processes

The feedback was also very focused on the processes employed for designing and installing the lanes. Feedback suggested improvements to the way Council works with the community on these types of projects in the future, including:

- Transparency about the rationale for the trial-separated bike lanes
- Lack of engagement in the design process
- Concerns about frayed community relations
- Mistrust.

Proposed future consultation Strategy

These findings outlined in "Section 2.3: Community feedback to date" suggest proactive and planned consultation is required for this project and others in the future.

In December 2020 (DEP 23/20) Council adopted the Community Engagement Policy which commits Council to involve our community in statutory and non-statutory projects. This report stated that:

"We will work directly with our community throughout the process to ensure that public concerns and aspirations are consistently understood and considered. We will work with our community to ensure that community concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how community input influenced the decision."

It is noted that this policy was adopted five months after Council endorsed these trials but changes from now on should be aligned with this policy.

a) Future engagement on Kent Road trial-separated bike lanes

Council will undertake engagement with the community on the current design plus alternative options one, three, five and six (see **Attachment 1**) as per Council's *Community Engagement Policy* (see **Attachment 4**).

The outcomes of the community engagement will inform a report to Council in late 2021/early 2022 and recommendations for the remainder of the trial period.

An independent engagement consultant will be engaged to advise on appropriate engagement activities. Type and number of activities will be dependent on level of community participation. Activities could include:

- **Partnership groups / Steering groups:** a group comprising Council officers and external stakeholders aimed at delivering a complex project that requires collaboration to achieve outcomes. Compatible with virtual or in-person engagement.
- **Workshops:** meetings at which a group of people engage in intensive discussion and activity on a particular subject or project. Compatible with virtual or in-person engagement.
- **Focus groups:** short, recurring, intensive meetings comprising Council officers and external stakeholders to receive feedback and progress ideas. Compatible with virtual or in-person engagement.
- **Site-tours/walks:** site visits to Kent Road with community members and council officers to discuss ideas and identify issues for resolution. Only compatible with in-person engagement and subject to Victorian Government health restrictions at the time.

b) Engagement for future bicycle projects

The proposed engagement process on Kent Road will be an opportunity to test new community engagement approaches for future bicycle projects.

The outcomes of this consultation process will form recommendations to Council in the late 2021/early 2022 report for consultation on future bike lane projects.

Affected persons rights and interests

Before making a decision that affects a person's rights, Council must identify whose rights may be directly affected and provide an opportunity for that person (or persons) to convey those views regarding the effect on their rights and consider those views.

5. Officer Declaration of Conflict of Interest

Council officers involved in the preparation of this report have no conflict of interest in this matter.

6. Financial and Resources Implications

The continued high level of officer involvement in this project is affecting the ability to deliver the 2021/22 transport capital works program and other MITS activities. Expanded engagement associated with planning and delivery of Council's bicycle projects in future years will also affect what we can deliver with existing resources. Council's commitment to community engagement is recognised through the *Community Engagement Policy* (2020), however transport projects often have conflicting views on the best outcome.

Council officers are currently reviewing the impacts of this workload. Different design options will have varying financial and resourcing impacts. This will be resolved in more detail in the late 2021/early 2022 report.

The consultation process is estimated to cost between \$20,000 to \$80,000 depending on the level of engagement and external resources required.

7. Implementation

Following adoption of the recommendations Council officers will begin planning and implementing the engagement process highlighted in point 3 of the resolution.

The community engagement and technical assessment of these steps will inform the late 2021/early 2022 Council report.

Attachment/s

1 	Kent Road Alternative Cross Section Designs - September	D21/358883
 2 	Kent Road Separated Bike Lane - Design Road Safety Audit	D21/359273
 3 	Kent Road Separated Bike Lane - Post Construction Road Safety Audit	D21/359256
		

Attachment 1 - Alternative Street Cross Section Designs, Kent Road, Pascoe Vale

Introduction

At the August 2021 Council meeting (8.1) Council resolved to receive a report at the September 2021 meeting, investigating how to continue the Kent Road trial using alternative design options that retain physically separated cycling infrastructure to keep residents on bikes safe, as well as providing more road space to motorists in light of concerns raised by some residents. Council instructed officers to investigate options such as:

- a) Bi-directional bike lanes involving the removal of one of the physically separated bike lanes on Kent Road and replacing with a consolidated, bi-directional bike lane on the opposite side of the road. One option would involve the removal of the existing bike lane on the north side of Kent Road and the installation of a bi-directional bike lane on the south side of the road.
- b) allowing removal of all concrete barriers on Kent Road and replace with plastic bollards on the south side only and the bike width lane should not exceed 1.2 metres.
- c) widening of the south side footpath on Kent Rd for example up to 1.8 metres to allow for bike lanes and pedestrian footpath that would be similar to what we have on Rhodes Parade, Oak Park, the continuation of Boundary Road, Pascoe Vale
- d) the option of a shared path for cyclists and pedestrians on the southern side of Kent Rd

In addition to the proposed options above, Council officers also propose two additional alternative designs (see options five and six) for consideration.

Design considerations

Design considerations are discussed in 'Section 3: Issues' of the Kent Road report and inform the alternative cross-section designs. In summary, the following design standards are applied:

1. Cycle lane width:

Bike lane type	Design requirement
One-lane	1.5 metre minimum
Bi-directional	2.6 metre minimum

2. Cycle lane physical separator / barrier:

Road environment	Design requirement	
Adjacent to on-street parking*	0.8m to 1.0m raised kerb barrier	0.8m to 1.0m painted marking with temporary traffic bollard
Adjacent to vehicle lane (no on-street parking)	0.4m to 1.0m raised kerb barrier	0.4m to 1.0m painted marking with temporary traffic bollard

*A minimum barrier of 0.8m is required adjacent to on-street parking as there is an inherent risk of 'car dooring', see figure 2 below

3. On-street parking: 2.1 metre (minimum) to 2.3 metre

4. Vehicle lane width:

Road environment	Vehicle lane widths	
	Minimum	Maximum
One-way flow	3.0m	3.5m
Two-way flow	2.8m each way (low speed and low volume)	3.5m each way
Pull-in/passing spots are needed	3.0m minimum	5.6m (road travel lanes greater than 5.6m do not require pull-in/passing spots)

Evaluation matrix

An evaluation of each design option was undertaken against cycling, vehicle, pedestrian and implementation and operational criteria. The criteria were identified through community feedback, alignment with policy, alignment with design considerations or pertaining to practical implementation and operational considerations.

Officers assessed each design option against the criteria and allocated a ranking as one of the following:

1. **High** – Achieves a positive outcome from the perspective of the user group or requires minimal change to implement
2. **Moderate** – Achieves a compromised outcome from the perspective of the user group or requires some change
3. **Poor** – Achieves a negative outcome from the perspective of the user group or requires significant change
4. **Very poor** – Achieves an unsafe outcome from the perspective of the user group or requires significant and impractical change to implement. Unsafe outcomes are not supported by council officers.

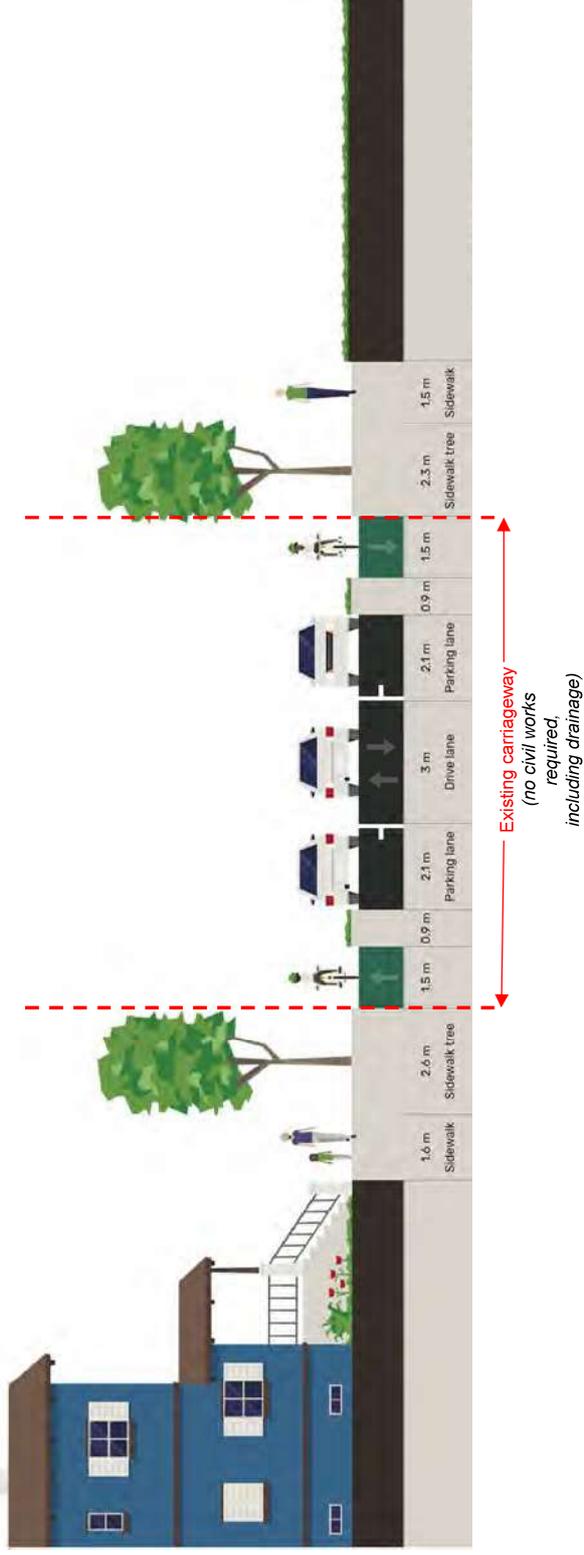
The evaluation matrix can be found on page 9 and 10 of this attachment.

Outcomes

Officer recommendations for consideration by Council are included in the Council report.

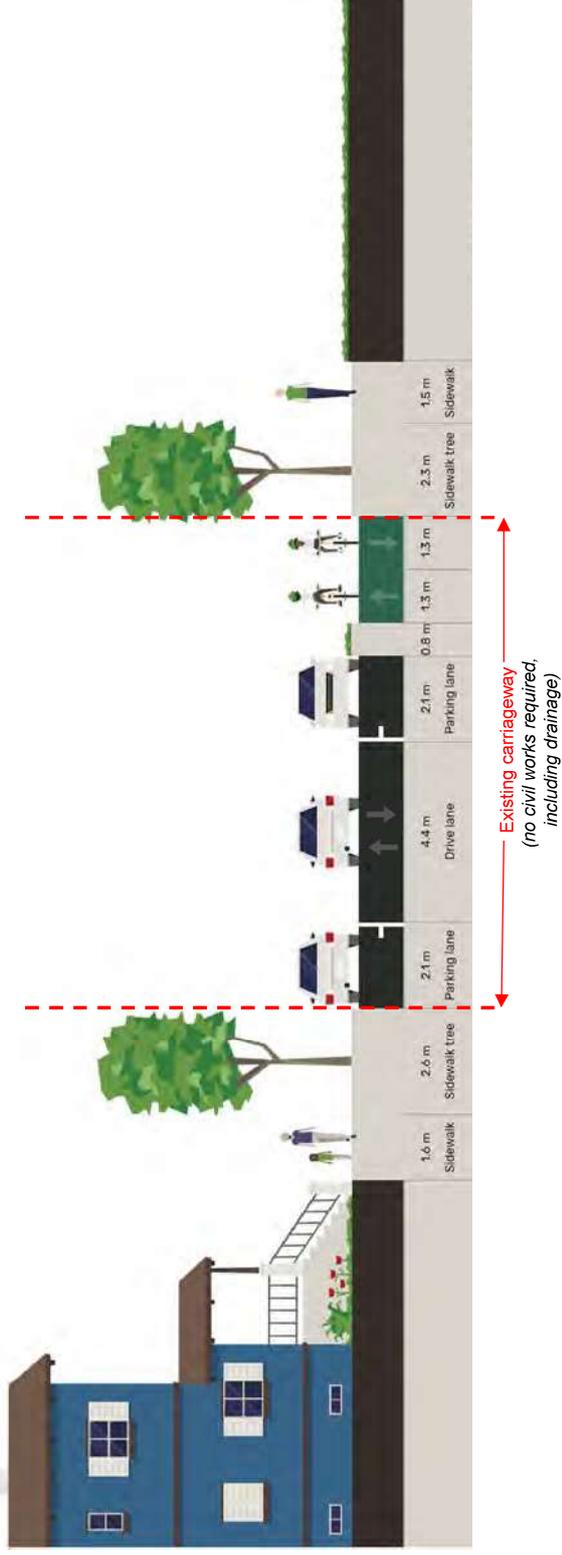
Kent Road – Current Trial Design (Looking East)

Separated bicycle lanes with raised physical barrier



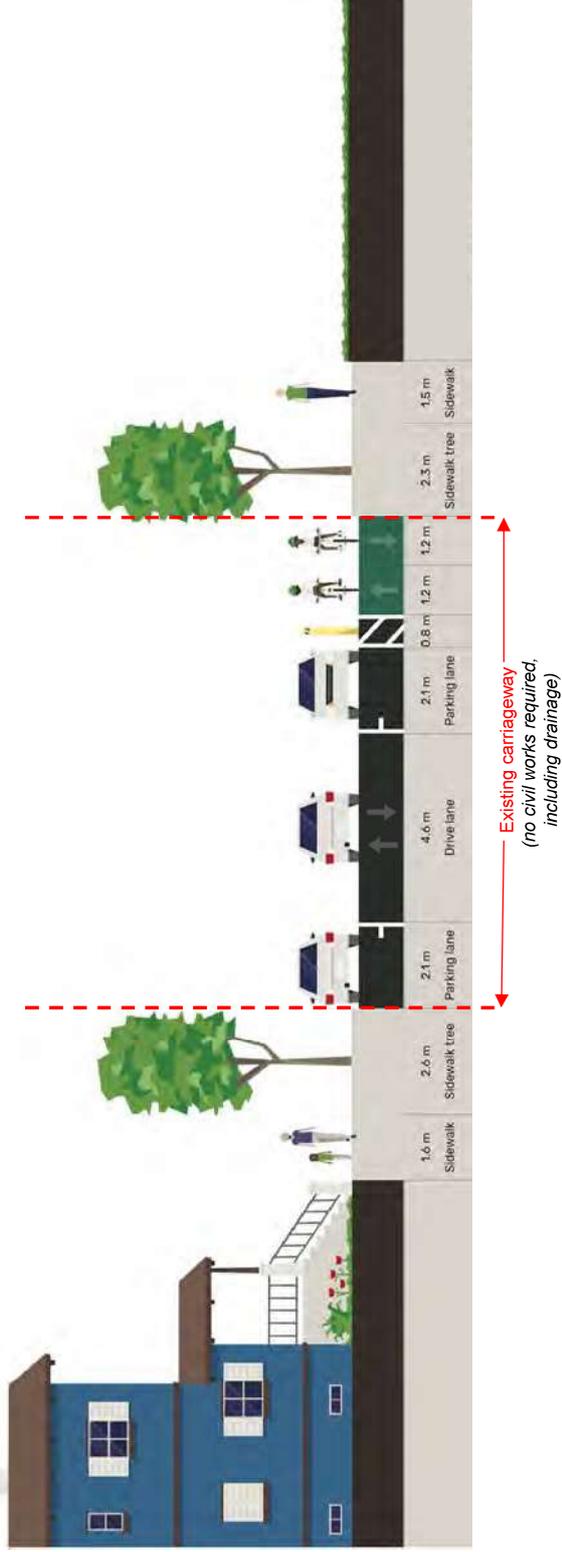
Kent Road – Option 1
(Minimum width bi-directional separated bike lanes and physical separator)
 (Looking East)

Bi-directional, 2.6m cycle lane on southern side. Removal of northern physical barrier. Reduction of southern barrier to 0.8m. Reallocation of 1.4m to driving lanes. This is slightly less than the existing vehicle carriage way of Kent Road east of Cumberland Road (8.6m here vs 9.0m on average for Kent Road east of Cumberland Road).



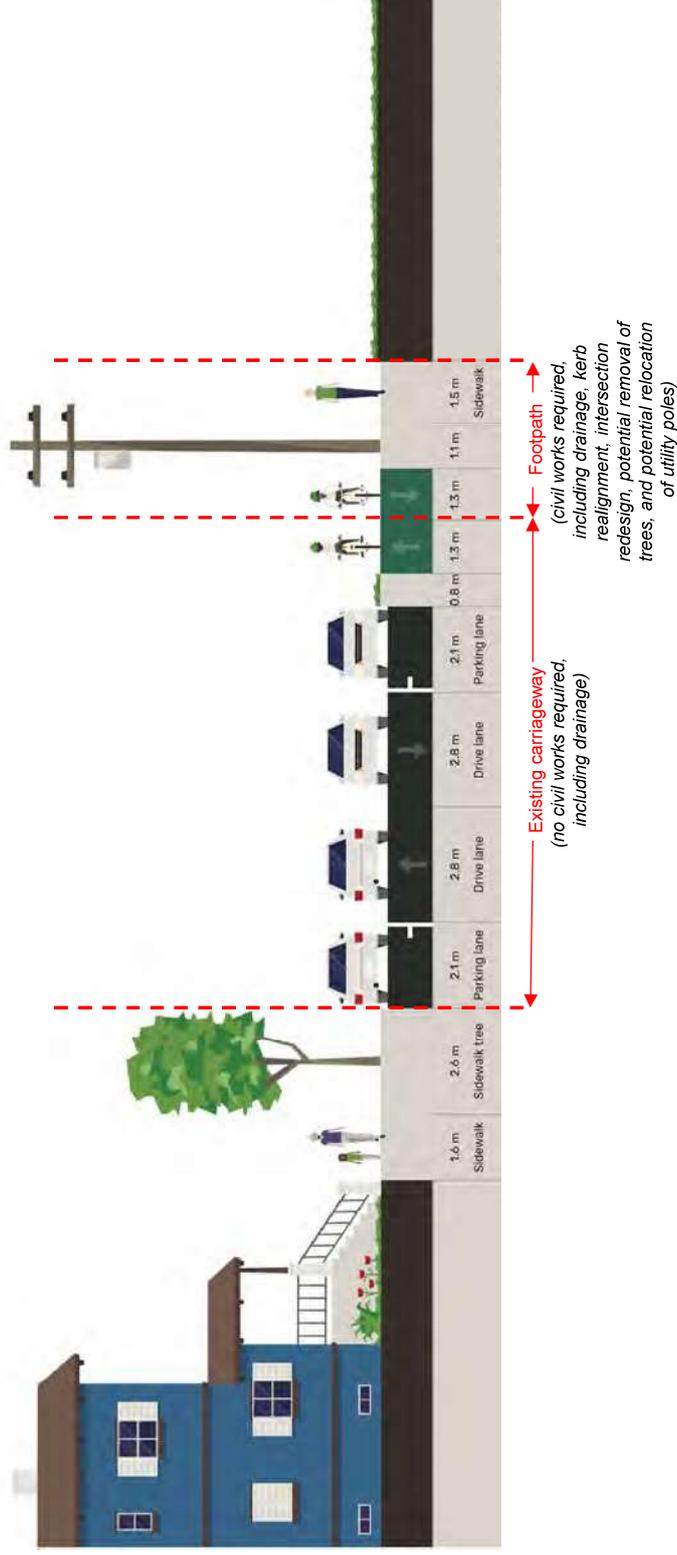
Kent Road – Option 2
Bike lanes max 1.2m with plastic bollards as separators
 (Looking East)

Removal of northern physical barrier. Reduction of southern physical barrier to 0.8m. Bi-directional, 2.4m cycle lane on southern side (insufficient operating width). Reallocation of 1.6m to driving lanes. This is slightly less than the existing vehicle carriage way of Kent Road east of Cumberland Road (8.8m here vs 9.0m on average for Kent Road east of Cumberland Road).



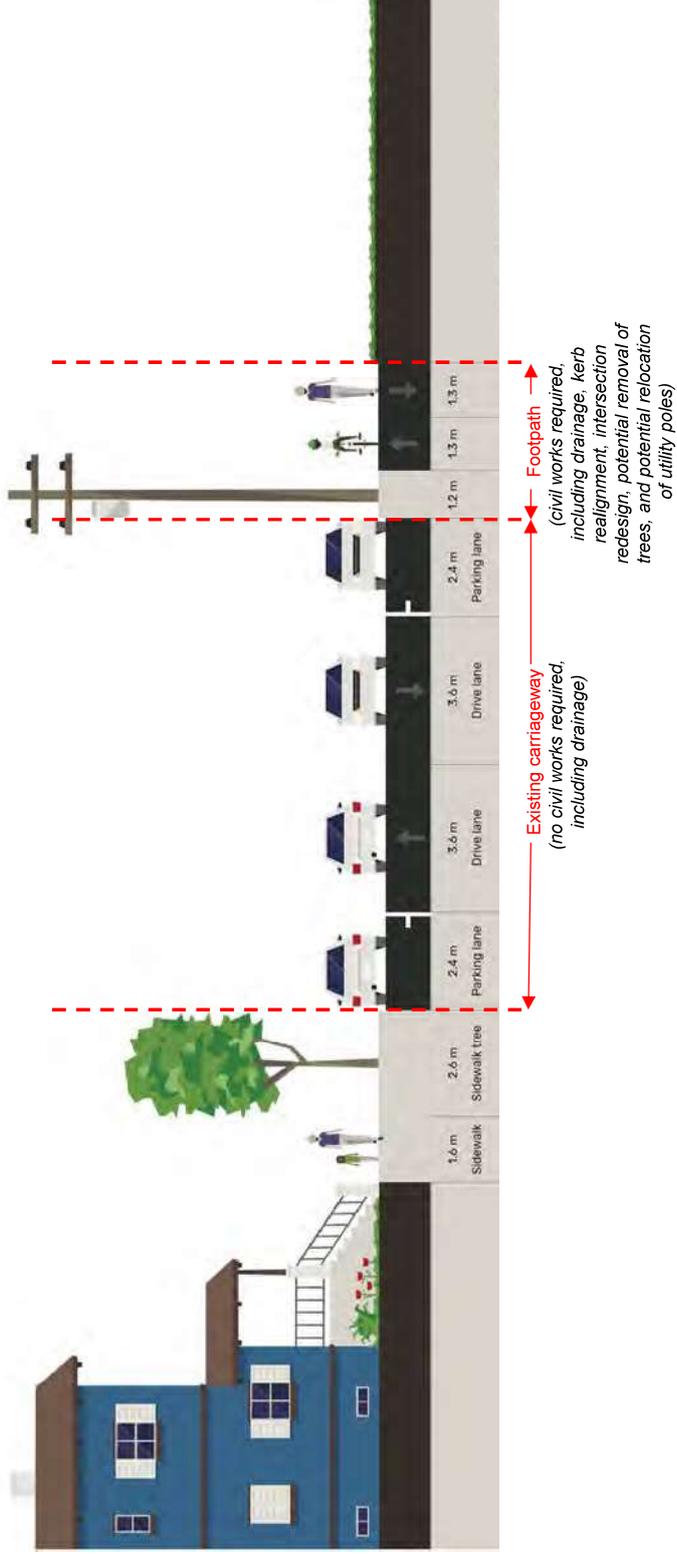
Kent Road – Option 3
Widening of the south side footpath to allow for bikes and footpath off road
 (Looking East)

Bi-directional, 2.6m cycle lane and 1.5m footpath on south side. Reduction of physical barrier to 0.8m. Removal of northern physical separator, 9.8m road carriageway facilitating two-way vehicle movement and parked cars. Significant civil works to relocate southern curb alignment and utility poles. Removal of trees on southern side. Detailed design required.



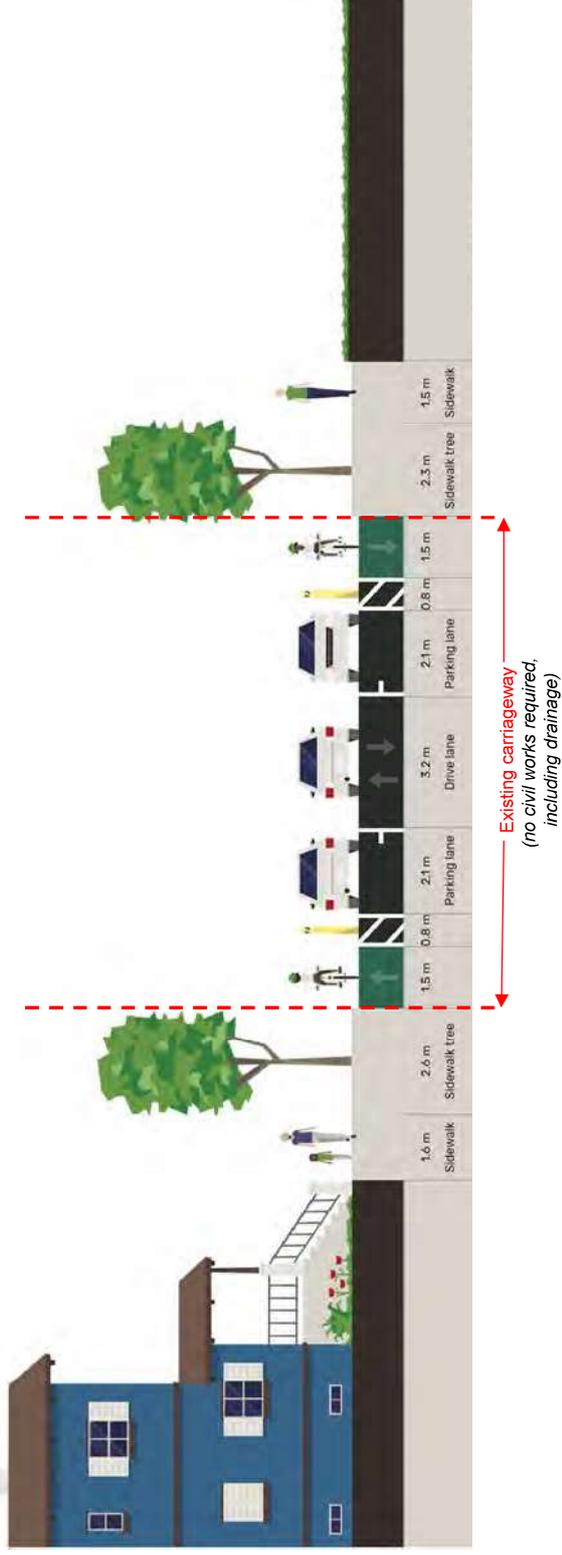
Kent Road – Option 4
Widening of the south side footpath to allow shared path
 (Looking East)

Bi-directional, 2.6m shared path. Unsafe for pedestrians and cyclists on southern shared path. Removal of all physical barriers. Vehicle carriageway returned to pre-June 2021 conditions. Significant civil works to relocate utility poles. Removal of trees on southern side. Detailed design required.



Kent Road – Option 5
Similar to current trial but removes physical concrete separator and replaces with 0.8m plastic bollard treatment
Looking East

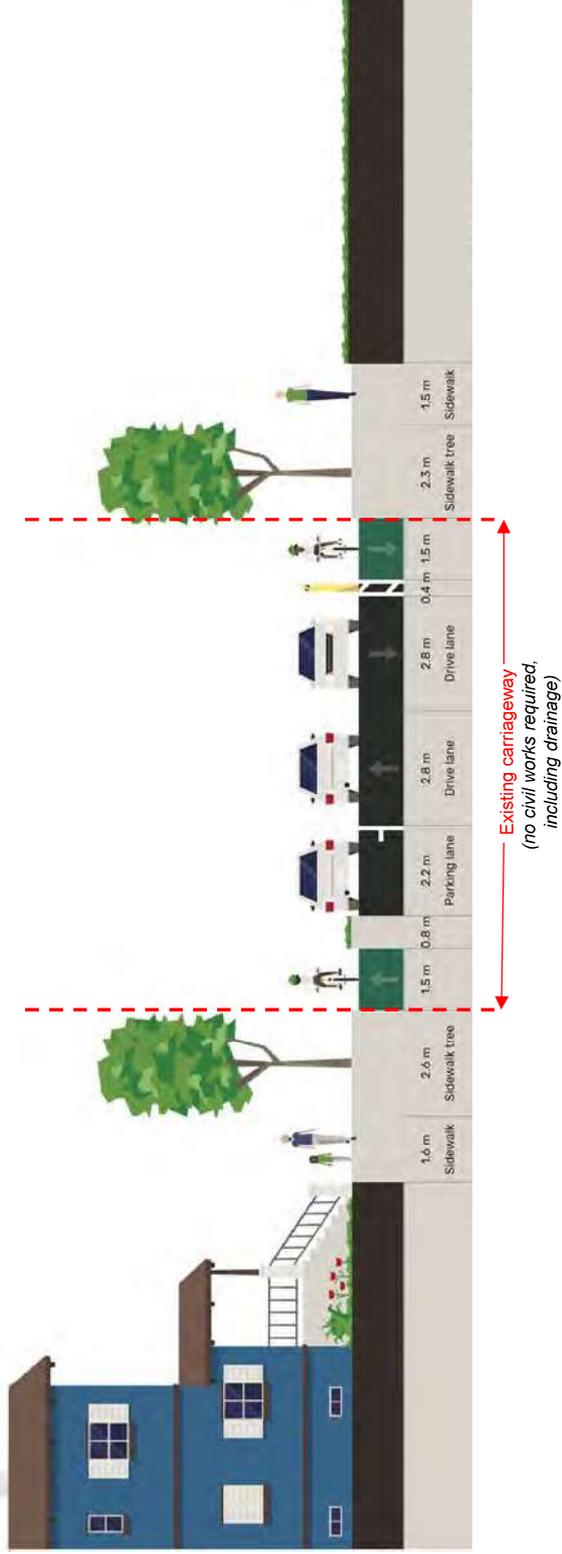
Reduction of physical separators to 0.8m. Reallocation of 0.2m to vehicle carriageway. Trial of temporary traffic bollards and painted lines as physical separator to improve walkability.



Kent Road – Option 6 Removal of parking on southern side and reduction in width of physical separators

Looking East

Removal of parking on southern side. Reduction of northern physical separator to 0.8m. Reduction of southern physical separator on southern side to 0.4m. Reallocation of 0.6m to vehicle carriageway.



Evaluation matrix	Current Design	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Cycling							
Cyclist perceived safety	High Physical separation from both cars and pedestrians. Allows enough separation between cyclists	High Physical separation from both cars and pedestrians. Allows enough separation between cyclists	Moderate Physical separation from both cars and pedestrians. Inadequate separation between cyclists due to narrow width.	High Physical separation from both cars and pedestrians. Allows enough separation between cyclists	Poor Cyclists conflict with pedestrians on shared path	High Physical separation from both cars and pedestrians	High Physical separation from both cars and pedestrians
Level of cycling accessibility for user groups	High Caters for "interested but concerned about cycling safety" (83% of people)	High Caters for "interested but concerned about cycling safety" (83% of people)	Poor Inadequate width for all skills levels and bicycle types	High Caters for "interested but concerned about cycling safety" (83% of people)	Poor Cyclists and pedestrians not separated.	High Caters for "interested but concerned about cycling safety" (83% of people)	High Caters for "interested but concerned about cycling safety" (83% of people)
Quality of cycling infrastructure	High Achieves bike lane and physical separator design standards	High Achieves bike lane and physical separator design standards	Poor Insufficient bike lane width	High Achieves bike lane and physical separator design standards	Poor Poor provision due to shared path with pedestrians	High Achieves bike lane and physical separator design standards	High Achieves bike lane and physical separator design standards
Direction of travel and integration at intersections	High Cyclist travel with expected traffic flow, integrate with expected traffic flow at intersections	Poor Westbound cyclists do not travel in expected direction, can conflict with pedestrians and vehicles upon re-entry to road network	Poor Westbound cyclists do not travel in expected direction, can conflict with pedestrians and vehicles upon re-entry to road network	Poor Westbound cyclists do not travel in expected direction, can conflict with pedestrians and vehicles upon re-entry to road network	Poor Westbound cyclists do not travel in expected direction, can conflict with pedestrians and vehicles upon re-entry to road network	High Cyclist travel with expected traffic flow, integrate with expected traffic flow at intersections	High Cyclist travel with expected traffic flow, integrate with expected traffic flow at intersections
Vehicles							
Vehicular perceived safety	Poor Narrow lane widths and give-way locations require vehicles to slow down to be safe	Poor Narrow lane widths and give-way locations require vehicles to slow down to be safe	Poor Narrow lane widths and give-way locations require vehicles to slow down to be safe	Moderate Narrow lane widths require vehicles to slow down to be safe	High Wider lane widths allow vehicles to travel safely under normal conditions	Poor Narrow lane widths and give-way locations require vehicles to slow down to be safe	Moderate Narrow lane widths require vehicles to slow down to be safe
Continuous traffic flow	Poor Vehicles required to give-way and negotiate between parked cars	Moderate Vehicles required to give way and negotiate between parked cars. Vehicle carriageway wider than current design.	Moderate Vehicles required to give way and negotiate between parked cars. Vehicle carriageway wider than current design.	High Continuous flow of vehicles facilitated at slow speed	High Continuous flow of vehicles facilitated	Poor Vehicles required to yield and negotiate between parked cars	High Continuous flow of vehicles facilitated at slow speed
Vehicle sight lines to on-coming cyclists	High Cyclists on inside of parked vehicles	High Cyclists on inside of parked vehicles	High Cyclists on inside of parked vehicles	Poor Potential conflict with driveways on southern side. Cyclists on inside of parked vehicles.	Poor Potential conflict with driveways on southern side. Cyclists on inside of parked vehicles.	High Cyclists on inside of parked vehicles	High Cyclists on inside of parked vehicles
On Street parking	Moderate 5 removed for bike lane allocation, 7 removed for give-way spots	Moderate No further change	Moderate No further change	Moderate No further change	High Return of all on-street parking as per prior to June 2021	Moderate No further change	Poor Removal of additional parking spaces on southern side (approx. 40 on-street parking spaces)

Please turn over, evaluation matrix continued on following page

Evaluation matrix	Current Design	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Pedestrians							
Pedestrian perceived safety	Moderate Pedestrians and cyclists separated. Pedestrians exiting parked vehicles required to cross bike lane on both sides of street	Poor Pedestrians and cyclists have potential conflict at intersections. Pedestrians exiting vehicles required to cross bike lanes on southern side	Poor Pedestrians and cyclists have potential conflict at intersections. Pedestrians exiting vehicles required to cross bike lanes on southern side	Poor Pedestrians and cyclists have potential conflict at intersections. Pedestrians exiting vehicles required to cross bike lanes on southern side	Very poor Pedestrians conflict with cyclists on shared path. Pedestrians exiting vehicles required to cross shared path on southern side	Moderate Pedestrians and cyclists separated. Pedestrians exiting vehicles required to cross bike lane on both sides of street	High Pedestrians and cyclists separated. Pedestrians exiting vehicles required to cross bike lane on northern side
Pedestrian network impact	Moderate Raised barriers restrict mid-block crossing. Refugement at Cornwall Road reduces crossing distances for pedestrians.	Poor Raised barriers restrict mid-block crossing. Removal of refugement at Cornwall Road = no safe resting spot for pedestrians.	Moderate Temporary traffic bollards allow easier mid-block crossing. Removal of refugement at Cornwall Road = no safe resting spot for pedestrians.	Poor Removal of refugement at Cornwall Road = no safe resting spot for pedestrians.	Very poor Pedestrians conflict with cyclists on shared path.	High Temporary traffic bollards allow easier mid-block crossing. Refugement at Cornwall Road reduces crossing distances for pedestrians.	High Temporary traffic bollards allow easier mid-block crossing. Refugement at Cornwall Road reduces crossing distances for pedestrians.
Implementation and operation							
Temporary or permanent infrastructure	High No change	Poor Not suitable for trial. Significant works required at intersections	Poor Not suitable for trial. Significant works required at intersections	Very poor Not suitable for trial. Significant and permanent infrastructure changes required along street	Very poor Not suitable for trial. Significant and permanent infrastructure changes required along street	High Limited, temporary works required	High Limited, temporary works required
Time to construct	High No change	Poor Significant, detailed plans and scope	Poor Significant, detailed plans and scope	Very poor Permanent works required exceeding trial period	Very poor Permanent works required exceeding trial period	Moderate Limited, temporary works required	Moderate Limited, temporary works required
External approvals required	High Local road, DoT approval not required	Poor DoT approval and works required at Cumberland Road intersection	Poor DoT approval and works required at Cumberland Road intersection	Poor DoT approval and works required at Cumberland Road intersection	Poor DoT approval and works required at Cumberland Road intersection	High Local road, DoT approval not required	High Local road, DoT approval not required
Tree removal and urban heat island	High No trees removed	High No trees removed	High No trees removed	Very poor Potential trees removed south side	Very poor Potential trees removed south side	High No trees removed	High No trees removed
Intersection design	High All modes integrate with traffic flow at intersections. Safe alternatives for less confident bike riders before entering on-street network	Poor Cornwall Rd: KW Joyce shared path realignment required. Cumberland Rd: Significant works to redesign roundabout. No safe point to re-enter on-street network	Poor Cornwall Rd: KW Joyce shared path realignment required. Cumberland Rd: Significant works to redesign roundabout. No safe point to re-enter on-street network	Poor Cornwall Rd: KW Joyce shared path realignment required. Cumberland Rd: Significant works to redesign roundabout. No safe point to re-enter on-street network	Poor Cornwall Rd: KW Joyce shared path realignment required. Cumberland Rd: Significant works to redesign roundabout. No safe point to re-enter on-street network	High All modes integrate with traffic flow at intersections. Safe alternatives for less confident bike riders before entering on-street network	High All modes integrate with traffic flow at intersections. Safe alternatives for less confident bike riders before entering on-street network
Street waste collection	Poor Bins required to be placed on physical separators. Under review	Poor Bins required to be placed on physical separators on south side. Under review	Moderate Bins required to be placed between temporary traffic bollards. Under review	High Bins placed on kerb.	High Bins placed on kerb	Moderate Bins required to be placed between temporary traffic bollards. Under review	Moderate Bins required to be placed between temporary traffic bollards. Under review



Kent Road and
Northumberland Road
Protected Bike Lanes, Pascoe
Vale



Road Safety Audit

Audit Stage: Concept Design

Report for Moreland City Council



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Information Page

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Public Liability Insurance Policy Number: 15T2402729
Victorian WorkCover Policy Number: 14074213



Executive Summary

Safe System Solutions Pty Ltd has been engaged by Moreland City Council to undertake a Concept Design Road Safety Audit of the proposed Protected Bike Lanes along Kent Road between Cornwall Road and Cumberland Road, Pascoe Vale and Northumberland Road between Rhodes Parade and to the north of Snell Grove, Pascoe Vale.

A number of issues have been identified associated with the following areas which require further consideration:

- a) Bike Lane Layout
- b) Driveways
- c) Pavement Markings
- d) Kerb ramps
- e) Parking
- f) Waste management

These issues are detailed in Section 3 Audit Findings and Recommendations of the Road Safety Audit report.



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List of Abbreviations

AADT – Annual Average Daily Traffic

RSA – Road Safety Audit

vpd – Vehicles per day



1. Background

1.1 Road Safety Audit Procedure

Road safety audit is a term used internationally to describe an independent review of a road project or existing road to identify any safety or performance concerns. The audit team considers the safety of all road users and qualitatively reports on road safety issues or opportunities for safety improvement. The team also considers other factors that are relevant to the existing site.

A road safety audit is therefore a formal examination of a road project, or any type of project which affects road users (including cyclists, pedestrians, mobility impaired etc.) or an existing road, carried out by an independent qualified team who identify and document road safety concerns. The objective of a road safety audit is to provide reasonable (but not absolute) assurance that potential, foreseeable hazards for all road users when a road is operational which may result in injury (in particular fatal and serious injury) are identified.

A road safety audit is intended to help deliver a safe road system and is **not** a review of compliance with standards.

1.2 The Safe System

The Austroads Guide to Road Safety Part 6 (2019): Managing Road Safety Audits states that: *"for any project, there is a responsibility on the road authority to maximise alignment with Safe System principles"*. The Guide continues to offer two methods for achieving this:

1. Undertake a Safe System Assessment in the early stages of the project.
2. Integrate Safe System principles into the Road Safety Audit process.

VicRoads Safe System Assessment Guidelines (2018) states that a Safe System Assessment *must* be undertaken for any Victorian Government project greater than \$5M in value, is *desirable* for where the project value is greater than \$2M and *optional* for projects under \$2M. Where A Safe System Assessment is not undertaken, the project team should document how the project has considered Safe System alignment. Safe System Assessments are most valuable when conducted during the early stages of a project.



Table 1: Safe System Kinetic Energy

	Crash Type	Tolerable (10%) Speed (passenger vehicle)
	Head-On	~70km/h
	Side Impact (90°) Side Impact (45°)	~50km/h ~60km/h
	Side Impact into Point Source Hazard (eg. Tree, Power Pole)	30 – 40km/h
	Pedestrian, Cyclist, Motorcyclist	~30km/h

Source: Austroads (2018).

This RSA has been undertaken to conform with AGRS Part 6: Managing Road Safety Audits (2019). As such, an assessment has been undertaken for each RSA finding to determine if the kinetic energy associated with the possible crash is above tolerable levels (as set out above). Also, each recommendation has been categorised into one of the Austroads Safe System treatment categories described in Table 2 below.

Table 2: Safe System Treatment Categories

Primary	Road planning, design and management considerations that practically eliminate the potential of fatal and serious injuries occurring in association with the foreseeable crash types.
Supporting (step towards)	Road planning, design and management considerations that improve the overall level of safety associated with foreseeable crash types, but not expected to virtually eliminate the potential of fatal and serious injury occurring. Improves the ability for a Primary Treatment to be implemented in the future.
Supporting	Road planning, design and management considerations that improve the overall level of safety associated with foreseeable crash types, but not expected to virtually eliminate the potential of fatal and serious injury occurring. Does not change the ability for a Primary Treatment to be implemented in the future.
Non-Safe System Other Elements	Road planning, design and management considerations that are not expected to achieve an overall improvement in the level of safety associated with foreseeable crash types occurring. Reduces the ability for a primary treatment to be implemented in the future.

Source: Austroads (2018a).



1.3 The Safety Audit Team

It is a requirement in Victoria that road safety audits are undertaken in teams of two or more, with at least one Senior Road Safety Auditor. Each auditor must be accredited and registered on VicRoads Register of Road Safety Auditors (www.vrsa.com.au). The team consisted of:

Table 3: Road Safety Audit Team

Senior Road Safety Auditors	Road Safety Auditor
<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div> Safe System Solutions Pty Ltd	
<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div> Safe System Solutions Pty Ltd	

1.4 Site inspections and meetings

A list of site inspections and meetings associated with this road safety audit is provided in the table below:

Table 4: Inspection and meetings

Activity	Location	Date	Time
PRE-AUDIT DISCUSSION	Telephone call with Kris Kasmawan (Transport Projects Engineer Moreland City Council)	08.01.21	1300
DAYTIME SITE INSPECTION	Kent Road and Northumberland Road, Pascoe Vale	12.01.21	1030
NIGHTTIME SITE INSPECTION	Kent Road and Northumberland Road, Pascoe Vale	11.01.21	2130



1.5 Audit process

This road safety audit has been conducted in accordance with the procedures set out in the *Austrroads Guide to Road Safety Part 6: Managing Road Safety Audits (2019)* and *Austrroads Guide to Road Safety Part 6A: Implementing Road Safety Audits (2019)*. A review of the site has been completed and the details contained within the supporting documentation examined to identify issues that affect road user safety and other relevant issues. The auditors cannot guarantee that every issue that affects road user safety has been identified. Although the adoption of the audit recommendations will improve the level of safety of the site it will not, however, eliminate all the road user safety risks.

Road safety audit is a formal process and the audit findings and recommendations should be documented by the client in writing. If recommendations are not accepted by the client then reasons should be included within the written response. A client is under no obligation to accept all the audit findings and recommendations and should consider these in conjunction with all other project considerations. It is not the role of the auditor to approve the client's response to an audit.



1.6 Risk assessment

The potential road safety problems identified have been assigned a risk rating based on the likelihood of a crash occurring as a result of the deficiency together with the potential consequence of that crash.

The risk ratings adopted are:

- ⇒ Intolerable
- ⇒ High
- ⇒ Medium
- ⇒ Low

Tables 6 to 8 below show the risk rating process.

Table 5: Likelihood of a crash (Austroads, 2019)

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five to ten years
Improbable	Less often than once every ten years

Table 6: Likely severity of a crash (Austroads, 2019)

Severity	Description	Examples
Catastrophic	Likely multiple deaths	<ul style="list-style-type: none"> - High speed, multi-vehicle crash on a freeway - Car runs into crowded bus stop - Bus and petrol tanker collide - Collapse of a bridge or tunnel
Serious	Likely deaths or serious injury	<ul style="list-style-type: none"> - High or medium speed vehicle/vehicle collision - High or medium speed collision with a fixed roadside object - Pedestrian or cyclists struck by a car
Minor	Likely minor injury	<ul style="list-style-type: none"> - Some low speed vehicle collisions - Cyclist falls from bicycle at low speed - Left-turn rear-end crash in a slip lane
Limited	Likely trivial injury or property damage only	<ul style="list-style-type: none"> - Some low speed vehicle collisions - Pedestrian walks into object (no head injury) - Car reverses into post

Table 7: Resulting level of risk (Austroads, 2019)

	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low



2. Scope of Audit

Kent Road is an east-west oriented two-lane, two-way road in Pascoe Vale. On-street parking is present along the entire section. The urban default speed limit (50km/h) applies for this section. The predominant land use in the area is residential, however, there is also a park (Cole Reserve) on the south side. Local Area Traffic Management treatments (speed humps) are installed along with bicycle sharrows. The carriageway is wide and the horizontal and vertical geometry are straight and consistent, enabling good sight lines. According to Moreland City Council Transport data, the AADT along this section is 1617 vpd.

Northumberland Road is a north-south oriented two-lane, two-way road in Pascoe Vale. On-street parking is present in the northern section but is restricted closer to the secondary school. The predominant land use in this area is residential, however, there is also a secondary school (Pascoe Vale Girls College) on the eastern side. Local Area Traffic Management treatments (speed humps and wombat crossing) are installed as well as a school crossing point. A school speed zone (40km/h) is present, outside of school hours the urban default speed limit (50km/h) applies. The horizontal geometry is straight, however there is a rising, steep gradient on approach to Snell Grove.

During the 5-year period ending 24/1/2019, there has been 1 police recorded crash in Kent Road. It involved a vehicle colliding with a bicycle while entering the Kent Road/ Cumberland Road roundabout resulting in minor injury.

Figure 1: Map of audit location (source: OpenStreetMap)



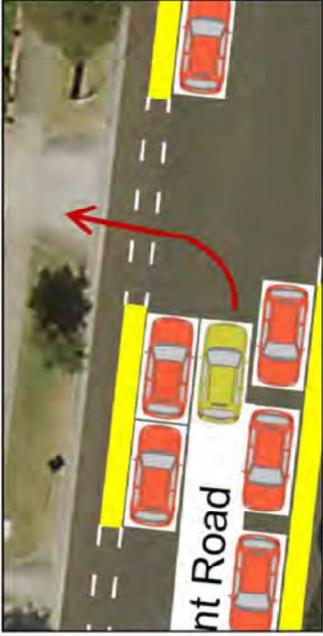


3. Audit Findings and Recommendations

The findings and recommendations of the Road Safety Audit can be found in the table below.

Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary S – Supporting N – Non-Safe System ST – Step Towards	Accept Yes/No	Responsible Officer Comments
<p>a) Bike Lane Layout</p> <p>i. Sharrows and bicycle wayfinding pavement marking exists on Crowley Court on approach to Northumberland Road – indicating this is a local bicycle route. Yet cyclists turning from Crowley Court cannot access the protected bike lane on Northumberland Road as there is no break* at this location. Similarly, cyclists using the protected bike lane are unable to turn into Crowley Court. This could encourage cyclists to perform unsafe manoeuvres.</p> 	<p>Occasional Minor MEDIUM</p>	<p>Within tolerable levels</p>	<p>*This finding has been developed with the assumption that the protected bike lane will be separated by a continuous kerb / physical barrier. Consider providing a break in the protected bike lane to enable a cyclist exiting from Crowley Court to access the protected bike lane. (S) Consider encouraging cyclists wanting to access Crowley Court to use the wombat crossing. (S)</p>		



Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Accept Yes/No	Responsible Officer Comments
<p>b) Driveways</p> <p>i. The design proposes to maintain on-street parking on Kent Street, adjacent the proposed protected bike lane. This will create tighter turning movements to enter / leave driveways and may result in minor side-swipe crashes with parked vehicles.</p> 	<p>Occasional Limited LOW</p>	<p>Within tolerable levels</p>	<p>Consider conducting swept path analysis to verify vehicles are able to access / leave driveways with parked vehicles in the proposed locations and modifying the parking layout as necessary (S).</p>		



Audit Findings	Level of Risk	Safe System Energy	Recommendations	Accept Yes/No	Responsible Officer Comments
<p>ii. The design proposes to maintain on-street parking on Kent Street, adjacent the proposed protected bike lane. Parked vehicles will impact on sight lines between the through traffic lane and the bicycle lane. As such, there is a risk that vehicles pulling into driveways will not be able to see cyclists in the bicycle lane resulting in collisions with cyclists.</p> 	<p>Occasional Minor MEDIUM</p>	<p>Within tolerable levels</p>	<p>P – Primary ST – Step Towards S – Supporting N – Non-Safe System</p> <p>Consider demarcating the parking bays and setting the edge of the parking bays further back from the edge of the driveway to improve sight lines (S). Consider providing regular breaks in the parking bays to open up sight lines between the traffic lane and the bicycle lane. (S)</p>		

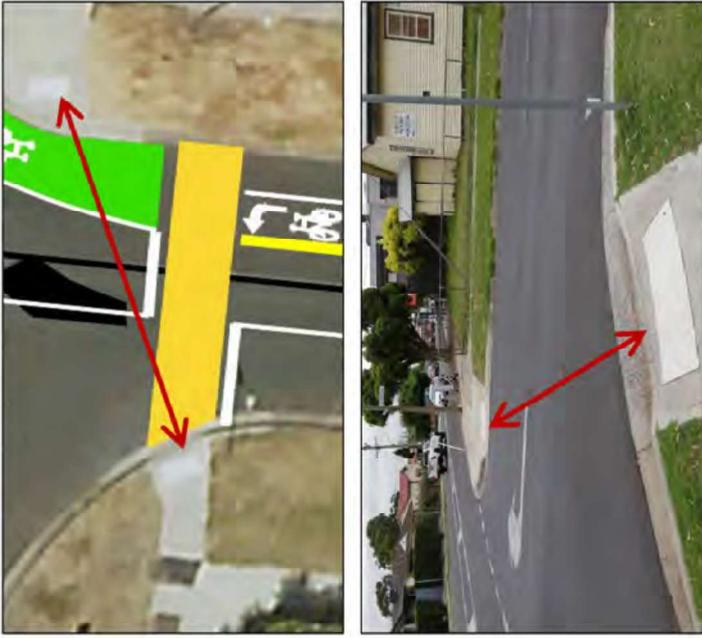
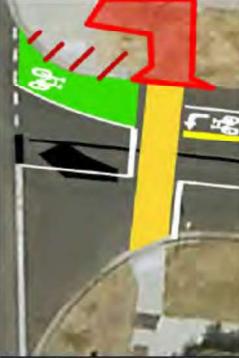


Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Accept Yes/No	Responsible Officer Comments
<p>c) Pavement Markings</p> <p>I. Eastbound cyclists on approach to the Cumberland Road roundabout are forced to merge from the protected bike lane into the traffic lane. This creates a conflict point between vehicles and cyclists. The proposed layout may confuse road users as it is not clear who gives way to who (do cyclists have priority when merging or do vehicles in the traffic lane have priority?)</p>  <p>This finding also applies where the protected bike lane terminates on approach to Cornwall Road.</p>	<p>Improbable Minor LOW</p>	<p>Within tolerable limits*</p>	<p>Consider installing a narrow pavement marking at this location to raise motorists' awareness that cyclists are merging. (S)</p>  <p>*The Safe System Energy has been recorded as "within tolerable limits" as vehicles would likely be slowing as they approach the roundabout. It is expected that vehicle speeds would be at or below 30km/h (the Safe System speed for vulnerable road user crash types).</p>		



Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Accept Yes/No	Responsible Officer Comments
<p>ii. The entrance to Pascoe Vale Girls College crosses the proposed protected bike lane. This creates a conflict point between vehicles and cyclists.</p> 	<p>Improbable Minor LOW</p>	<p>Within tolerable limits</p>	<p>As this access leads to the school car park, it is expected there are a relatively large number of vehicles turning into and exiting this driveway. As such, it is recommended to install green conflict paint across the bike lanes to raise motorists' awareness of cyclists in the area. (S)</p>		



Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Accept Yes/No	Responsible Officer Comments
<p>d) Kerb ramps</p> <p>L The kerb ramps on Northumberland Road near the Rhodes Parade intersection are staggered. Pedestrians would be required to cross at an angle (shown with arrows). This is not the most direct (shortest) path for pedestrians to take and increases their time on the carriageway, thus increasing the risk of pedestrian and vehicle collisions.</p> 	<p>Improbable Minor LOW</p>	<p>Within tolerable limits</p>	<p>Consider shifting the kerb ramp further south to match up with the proposed coloured pavement. (S) It is noted that there is a utility pole support cable installed in this area, which may affect the relocation of the kerb ramp.</p> 		



Audit Findings		Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Accept Yes/No	Responsible Officer Comments
e) Parking						
I.	Parking adjacent the protected bike lane on Northumberland Road is proposed to be removed. Without appropriate signage, motorists may be unaware parking is not allowed.	TO NOTE	N/A	Currently, "NO STANDING" signage is installed at some locations, but only applies during school hours. Consider installing 'NO STANDING' signage on the eastern side of Northumberland Road to cover the length of the proposed protected bike lane. (S)		
f) Waste management						
I.	Waste vehicles (garbage trucks) will still service both Kent Road and Northumberland Road. It is likely that garbage trucks would need to prop and wait in the traffic lane and have a team member roll bins from the edge of the nature strip to the truck (across the protected bike lane). This increases the risk of a worker being struck by a cyclist and could lead to increased driver frustration for motorists stuck behind the garbage truck), increasing the risk of motorists performing unsafe overtaking manoeuvres. Nonetheless, given the metro environment, traffic calming measures and narrowing road environment this risk may not be a significant risk.	TO NOTE	N/A	It is recommended to discuss with waste management crews the operational impact the protected bike lanes may have on their duties.		



4. Conclusion

This road safety audit has been conducted in accordance with the procedures set out in the *Austrroads Guide to Road Safety Part 6: Managing Road Safety Audits (2019)* and *Austrroads Guide to Road Safety Part 6A: Implementing Road Safety Audits (2019)*. The site has been inspected and the supporting documentation has been examined. The findings, recommendations and Safe System elements are provided for consideration by the client and any other interested parties.

Auditors:

[Redacted Signature] 18.01.2021
Senior Road Safety Auditor

[Redacted Signature] 18.01.2021
Senior Road Safety Auditor



Appendix A: Photos



Photo 1 Kent Road midblock, looking west



Photo 2 Northumberland Road midblock, looking south





Photo 3 Kent Road at Cornwall Road intersection, looking east



Photo 4 Northumberland Road at Crowley Court, looking south-west





Photo 5 Kent Road midblock, looking west (night)



Photo 6 Northumberland Road midblock, looking south (night)





Kent Road Protected Bike Lanes,
Pascoe Vale

Road Safety Audit



Audit Stage: Post Construction

Report for Moreland City Council



Moreland City Council



safesystemsolutions.com.au



Information Page

DATE: 27/07/2021

CLIENT: Moreland City Council

PROJECT NUMBER: S20210246

QUALITY RECORD:

Issue	Date	Description	Prepared By	Reviewed By	Approved By
1	27.07.2021	First Issue			

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Max McCardel | Reece Gunther

Engineers

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Public Liability Insurance Policy Number: 15T2402729
Victorian WorkCover Policy Number: 14074213



Executive Summary

Safe System Solutions Pty Ltd has been engaged by the Moreland City Council to undertake a post construction stage Road Safety Audit of the newly installed bicycle lanes along Kent Road between Cornwall Road and Cumberland Road, Pascoe Vale.

A number of issues have been identified which require further investigation and consideration:

- a. Cycle path issues
- b. Roadway width
- c. Parking

These issues are detailed in Section 3 of the Road Safety Audit report.



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List of Abbreviations

DDA – Disability Discrimination Act

RSA – Road Safety Audit

TGSI – Tactile Ground Surface Indicator



1. Background

1.1 Road Safety Audit Procedure

Road safety audit is a term used internationally to describe an independent review of a road project or existing road to identify any safety or performance concerns. The audit team considers the safety of all road users and qualitatively reports on road safety issues or opportunities for safety improvement. The team also considers other factors that are relevant to the existing site.

A road safety audit is therefore a formal examination of a road project, or any type of project which affects road users (including cyclists, pedestrians, mobility impaired etc.) or an existing road, carried out by an independent qualified team who identify and document road safety concerns. The objective of a road safety audit is to provide reasonable (but not absolute) assurance that potential, foreseeable hazards for all road users when a road is operational which may result in injury (in particular fatal and serious injury) are identified.

A road safety audit is intended to help deliver a safe road system and is **not** a review of compliance with standards.

1.2 The Safe System

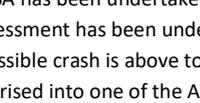
The Austroads Guide to Road Safety Part 6 (2019): Managing Road Safety Audits states that: *"for any project, there is a responsibility on the road authority to maximise alignment with Safe System principles"*. The Guide continues to offer two methods for achieving this:

1. Undertake a Safe System Assessment in the early stages of the project.
2. Integrate Safe System principles into the Road Safety Audit process.

VicRoads Safe System Assessment Guidelines (2018) states that a Safe System Assessment *must* be undertaken for any Victorian Government project greater than \$5M in value, is *desirable* for where the project value is greater than \$2M and *optional* for projects under \$2M. Where A Safe System Assessment is not undertaken, the project team should document how the project has considered Safe System alignment. Safe System Assessments are most valuable when conducted during the early stages of a project.



Table 1: Safe System Kinetic Energy

	Crash Type	Tolerable (10%) Speed (passenger vehicle)
	Head-On	~70km/h
	Side Impact (90°)	~50km/h
	Side Impact (45°)	~60km/h
	Side Impact into Point Source Hazard (eg. Tree, Power Pole)	30 – 40km/h
	Pedestrian, Cyclist, Motorcyclist	~30km/h

Source: Austroads (2018).

This RSA has been undertaken to conform with AGRS Part 6: Managing Road Safety Audits (2019). As such, an assessment has been undertaken for each RSA finding to determine if the kinetic energy associated with the possible crash is above tolerable levels (as set out above). Also, each recommendation has been categorised into one of the Austroads Safe System treatment categories described in Table 2 below.

Table 2: Safe System Treatment Categories

Primary	Road planning, design and management considerations that practically eliminate the potential of fatal and serious injuries occurring in association with the foreseeable crash types.
Supporting (step towards)	Road planning, design and management considerations that improve the overall level of safety associated with foreseeable crash types, but not expected to virtually eliminate the potential of fatal and serious injury occurring. Improves the ability for a Primary Treatment to be implemented in the future.
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Non-Safe System Other Elements	Road planning, design and management considerations that are not expected to achieve an overall improvement in the level of safety associated with foreseeable crash types occurring. Reduces the ability for a primary treatment to be implemented in the future.

Source: Austroads (2018a).



1.3 The Safety Audit Team

It is a requirement in Victoria that road safety audits are undertaken in teams of two or more, with at least one Senior Road Safety Auditor. Each auditor must be accredited and registered on VicRoads Register of Road Safety Auditors (www.vrsa.com.au). The team consisted of:

Table 3: Road Safety Audit Team

Senior Road Safety Auditors	Road Safety Auditor
<p>██████████ Safe System Solutions Pty Ltd</p> <p>██████████ Safe System Solutions Pty Ltd</p>	

1.4 Site inspections and meetings

A list of site inspections and meetings associated with this road safety audit is provided in the table below:

Table 4: Inspection and meetings

Activity	Location	Date	Time
PRE-AUDIT DISCUSSION	Phone call	12.07.2021	1520
DAYTIME SITE INSPECTION	Kent Road, Pascoe Vale	13.07.2021	0945
PRELIMINARY FINDINGS DISCUSSION	Video call	14.07.2021	1200
NIGHT TIME SITE INSPECTION	Kent Road, Pascoe Vale	21.07.2021	2210



1.5 Audit process

This road safety audit has been conducted in accordance with the procedures set out in the *Austrroads Guide to Road Safety Part 6: Managing Road Safety Audits (2019)* and *Austrroads Guide to Road Safety Part 6A: Implementing Road Safety Audits (2019)*. A review of the site has been completed and the details contained within the supporting documentation examined to identify issues that affect road user safety and other relevant issues. The auditors cannot guarantee that every issue that affects road user safety has been identified. Although the adoption of the audit recommendations will improve the level of safety of the site it will not, however, eliminate all the road user safety risks.

Road safety audit is a formal process and the audit findings and recommendations should be documented by the client in writing. If recommendations are not accepted by the client then reasons should be included within the written response. A client is under no obligation to accept all the audit findings and recommendations and should consider these in conjunction with all other project considerations. It is not the role of the auditor to approve the client’s response to an audit.

1.6 Risk assessment

The potential road safety problems identified have been assigned a risk rating based on the **likelihood** of a crash occurring as a result of the deficiency together with the potential **consequence** of that crash.

The risk ratings adopted are:

- ⇒ **Intolerable**
- ⇒ **High**
- ⇒ **Medium**
- ⇒ **Low**

Tables 6 to 8 below show the risk rating process.

Table 5: Likelihood of a crash (Austrroads, 2019)

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
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Improbable	Less often than once every ten years



Table 6: Likely severity of a crash (Austroads, 2019)

Severity	Description	Examples
Catastrophic	Likely multiple deaths	<ul style="list-style-type: none"> - High speed, multi-vehicle crash on a freeway - Car runs into crowded bus stop - Bus and petrol tanker collide - Collapse of a bridge or tunnel
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Limited	Likely trivial injury or property damage only	<ul style="list-style-type: none"> - Some low-speed vehicle collisions - Pedestrian walks into object (no head injury) - Car reverses into post

Table 7: Resulting level of risk (Austroads, 2019)

	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low



2. Scope of Audit

The subject of this audit is the recently installed protected bicycle lanes along Kent Road between Cornwall Road and Cumberland Road in the suburb of Pascoe Vale. A map of the audit location is shown in Error! Reference source not found. below.

Figure 1: Map of audit location (Source: Open Street Maps)



Kent Road, in the audit area, is a two-way undivided road with urban default speed limit of 50km/h. It runs in the east-west direction, bounded by Cornwall Road to the west, forming a T-intersection and by Cumberland Road to the east, forming a roundabout. The surrounding land use is predominantly residential, with nature reserves on the southern side of Cumberland Road intersection and to the west of Cornwall Road intersection.

Kerb side protected bicycle lanes were recently installed on both sides of Kent Road. Speed humps are present along with bicycle sharrow markings on eastern approach to Cumberland Road roundabout and at Cornwall Road, Valerie Street intersection. According to the traffic survey conducted in 2020, the daily traffic volume for Kent Road in audit area is 2,000 vpd.

During the 5-year period ending 24/07/2019, there have been two police recorded crashes in the audit area, both of which involved cyclists. The list of crashes has been presented in the table below:

Road	Persons Involved	Date	Severity
Kent Road/Cumberland Road Roundabout	2 (cyclist and vehicle)	16/05/2017	Serious (cyclist) Non-injury (vehicle)
Kent Road/Cumberland Road Roundabout	2 (cyclist and vehicle)	24/05/2017	Other (cyclist) Non-injury (vehicle)

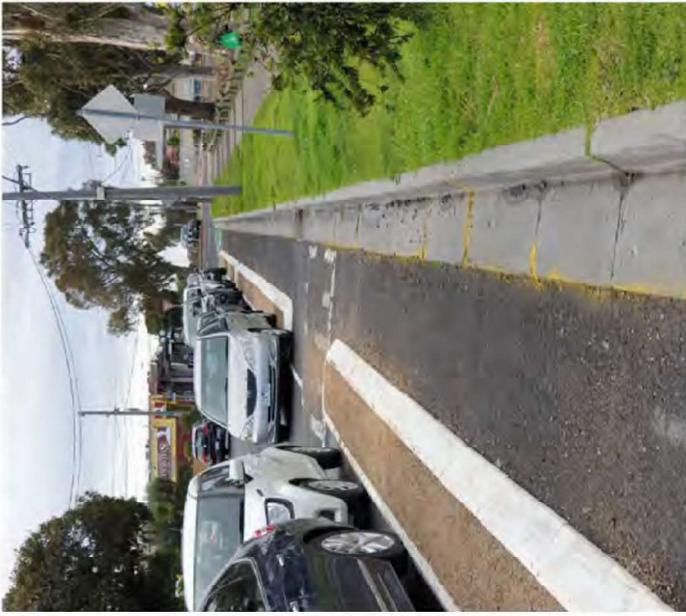


3. Audit Findings and Recommendations

The findings and recommendations of the Road Safety Audit can be found in the table below.

Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Accept Yes/No	Responsible Officer Comments
<p>a) Cycle path issues</p> <p>i) On the westbound bicycle path just east of Valerie St, there is a longitudinal groove on the path surface that may be hazardous to cyclists. Narrow bicycle wheels can get caught and tramline in this groove.</p>  <p>It appears to already have been identified as a hazard and highlighted with some yellow paint.</p>	<p>Probable Minor HIGH</p>	<p>Within tolerable limits</p>	<p>Consider resurfacing the path to remove these grooves (S)</p>		



Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Responsible Officer Accept Yes/No Comments
<p>ii) Cycle paths are formed kerbside by the installation of a 1.0m wide temporary separator, positioned to provide approx. 1.2m cycle path width between kerb and separator. However the kerb channel forms part of this path width.</p> <p>The join between the channel lip and asphalt road/path forms a level change or a groove that may trap narrow bicycle tyres and may be hazardous to cyclists. This may be exacerbated over time as the asphalt and concrete parts of the path settle and form step changes in the surface.</p> 	<p>Occasional Minor MEDIUM</p>	<p>Within tolerable limits</p>	<p>If space permits, consider widening the path to min 1.2m excluding the drainage channel, so that cyclists are less likely to contact this groove. (S)</p>	



Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Accept Yes/No	Responsible Officer Comments
<p>b) Roadway width</p> <p>The trafficable roadway width has been reduced due to the provision of the new cycle paths. Previously, the width of Kent Road accessible to motor vehicles was sufficient for vehicles four-abreast (two parked kerbside plus two concurrent traffic lanes). Two-way traffic were not required to take turns to pass.</p> <p>Post the installation of the protected cycle paths, the residual roadway width is in the vicinity of 7.5m wide. Where cars are parked on both sides (as is the case in areas of high parking demand), two-way traffic must take turns to pass, as illustrated in the photo below.</p>  <p>While this method of traffic operation is not inherently unsafe, a hazard may arise when the habitual behaviour of local drivers overrides any recognition of the new traffic layout. Drivers who are used to driving this street without having to take turns with oncoming traffic can experience cognitive dissonance and fail to perceive the risks when approaching another vehicle. As a result, they may also fail to take the appropriate evasive action. This is usually followed by a collision and much blaming of third parties, which are typical outcomes from driver cognitive dissonance.</p> <p>The risk outlined above is highest immediately after changes are implemented, and decay as drivers recognise that change has occurred and get used to the new layout.</p>	<p>Occasional Minor MEDIUM</p>	<p>Within tolerable limits</p>	<p>Consider temporary signage to bring to the attention of all drivers that road conditions have changed. (S) An example sign is shown below.</p> 		



Audit Findings	Level of Risk	Safe System Energy	Recommendations P – Primary ST – Step Towards S – Supporting N – Non-Safe System	Accept Yes/No	Responsible Officer Comments
<p>c) Parking</p> <p>i) At the time of the daytime site visit, several cars were observed to have parked one wheel up on the temporary separators on the south side of Kent Road. This appears to be related to the use of semi-mountable kerb for this separator as this effect was not observed on the north side of Kent Road where a more upright barrier kerb design is used.</p> <p>Cars parking on the separators may be a hazard because:</p> <ol style="list-style-type: none"> 1. there is reduced buffer space between the parked car and the cycle path, which increases the risk of car dooring to cyclists. 2. Parking movements may be erratic as vehicles mount the kerb and may be harder to control. 	<p>Improbable Minor LOW</p>	<p>Within tolerable limits</p>	<p>Consider replacing the mountable kerb separators with barrier kerb (S) Consider installing flexible bollards on the kerb separators. (S)</p>		



d) Conclusion

This road safety audit has been conducted in accordance with the procedures set out in the *Austroads Guide to Road Safety Part 6: Managing Road Safety Audits (2019)* and *Austroads Guide to Road Safety Part 6A: Implementing Road Safety Audits (2019)*. The site has been inspected and the supporting documentation has been examined. The findings, recommendations and Safe System elements are provided for consideration by the client and any other interested parties.

Auditors:

..... [Redacted Signature] 26.07.2021

[Redacted Name]
Senior Road Safety Auditor

..... [Redacted Signature] 26.07.2021

[Redacted Name]
Senior Road Safety Auditor



Appendix A: Photos



Photo 1: Cornwall Road and Kent Road intersection – facing east towards Kent Road



Photo 2: Valerie Street and Kent Road intersection – facing south towards Valerie Street



Photo 3: Kent Road – facing west across frontage of Pascoe Vale Health



Photo 4: Kent Road approaching Cumberland Road roundabout – facing east



Photo 5: Parked Vehicles on Kent Road



Photo 6: Parked Vehicles on Kent Road opposite Pascoe Vale Health



Photo 7: Kent Road approaching Cumberland Road roundabout – facing east



Photo 8: Kent Road and Joffre Road intersection – facing east