



## JUNCTION DESIGN IS KEY TO REDUCED BUS JOURNEY TIMES AND AN OPTIMISED SOLUTION FOR MILTON ROAD

Dear Member of the Executive Board,

Milton Road Alliance has studied the officers' Milton Road report thoroughly and thanks to the data and analysis it contains we are confident that a solution that will meet the needs of all stakeholders is within our grasp. This is a turning point for the Greater Cambridge Partnership and, if the right decisions are taken now, it will bode well for the future of Milton Road and could beneficially influence the approach taken on other urban roads.

Please consider the following:

- The predicted journey times for all motor vehicles including buses under 'Final Concept' are better than the predictions for any of the 'Do Nothing' scenarios, and 'Final Concept' almost always shortens the queues at individual junctions, often considerably, compared to the 'Do Nothing' option.
- The modelling results for 'Final Concept' show that its predicted improvements to bus reliability and journey time have little to do with bus lanes and almost everything to do with the clever designs for the four major junctions along Milton Road. And that's without any bus priority measures incorporated into the junctions themselves, as yet.
- Bus lanes don't need to be much longer than the predicted maximum queue length at the approach to junctions.

We are aware that officers consider the bus lane lengths in 'Final Concept' to be the maximum likely but this is not a strong enough guarantee for us. Therefore we are asking you to recommend taking the junction designs from 'Final Concept' and combining them with the streetscape from 'Do Optimum' with its shorter length of bus lane; with its trees, verges and good bus stops; with its attractive walking and cycling facilities; and use that as a starting point for benefit/cost evaluation that will determine the basis for detailed design and preparation of business case. The **proposal** that follows this letter from Milton Road Alliance describes the procedure whereby the optimum lane lengths could be derived from a benefit/cost analysis.

If you allow our proposal to go forward then a fully optimised solution can emerge, one that we can all be proud to hand down as a legacy to the next generation.

Yours sincerely,

Michael Page, Charles Nisbet, Matthew Danish

The Milton Road Alliance

## FULL PROPOSAL

In the officers' report, the predicted journey times for all motor vehicles under 'Final Concept' is better than the predictions for any of the 'Do Nothing' scenarios. Even more interestingly, the model predicts that 'Final Concept' will get better with age, as the results say that in the year 2031 the car commute into Cambridge would speed up by half a minute if 'Final Concept' were taken forward.

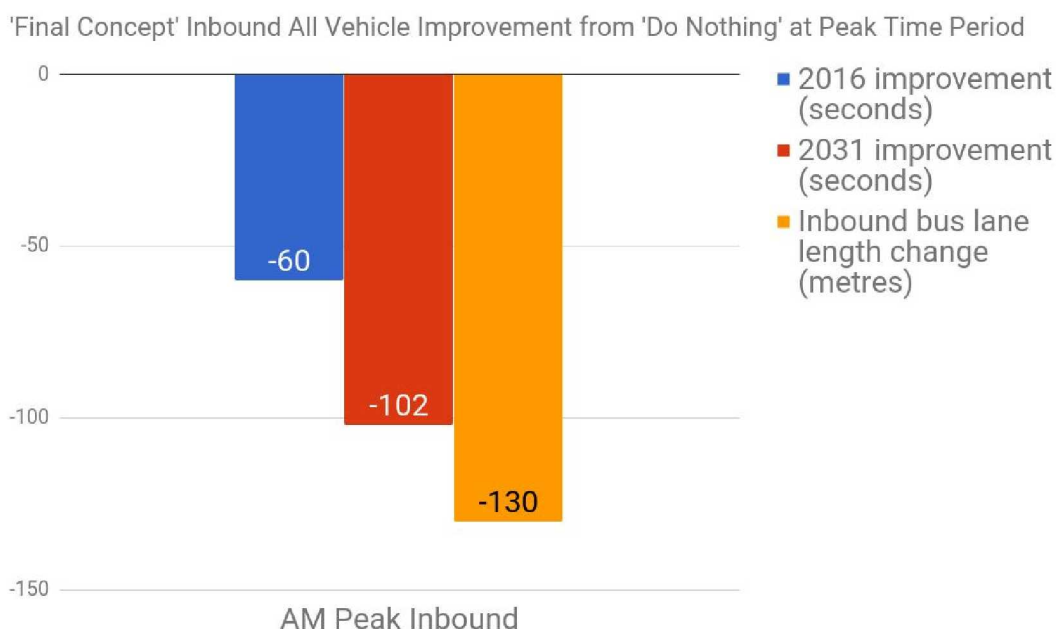
When we look at individual junction performance under all scenarios, the 'Final Concept' almost always shortens the queues, often considerably, compared to the 'Do Nothing' option.

Then there is this quote from the report:

"The 2016 AM 'Final Concept' bus reliability results shows improved bus reliability for both directions of travel, maintaining average bus journey times inbound (even with a reduction of bus lanes on this side of the road in comparison to 'Do Nothing')"

The modelling of 'Final Concept' shows that a reduction of bus lane length is compatible with improved bus reliability and journey time. Extensive data and selections from the report are shown and discussed in the Appendix below. It seems that the shorter queues at junctions mean that the bus lanes don't get a chance to provide much benefit after all.

These modelling results for motor vehicles under 'Final Concept' show that its predicted improvements to bus reliability and journey time have little to do with bus lanes and almost everything to do with the clever designs for the four major junctions along Milton Road. And that's without any bus priority measures incorporated into the junctions themselves, yet.



With these findings in mind, we have a compromise proposal that we believe can make everyone happy.

**We ask the Executive Board: will you take up our proposal to put forward a hybrid design that is based on 'Final Concept' for the junctions and junction approaches while incorporating the concepts of 'Do Optimum' for much of the links in between? Will you instruct officers to take into account the diminishing returns of lengthy bus lanes, and to consult the Local Liaison Forum to find when the costs of lengthy bus lanes exceed the benefits?**

We are aware that the officers have already offered to consider a reduction in bus lane length from the maximum proposed, but this is not a strong enough guarantee for us. Instead, we propose that since the greatest improvement comes from the 'Final Concept' junction designs, then we should start from a presumption of shorter bus lane lengths and work from there, calculating the costs and benefits along the way.

The procedure then goes:

- Calculate the benefit/cost ratio of this new 'Final Optimum' hybrid design starting with bus lanes only within the vicinity of junctions and no longer than their predicted queue lengths in 2031.
- Be sure to include benefits such as safe, attractive walking and cycling, sufficient verge space for high-quality bus stops, modal shift to sustainable transport in general, improved streetscape, local business, trees, air quality, etc, in addition to bus journey times and reliability.
- Then seek the optimum benefit/cost ratio by adjusting the length of bus lane.

This procedure will produce a scientifically driven business case that takes into account all stakeholders' concerns and objectives.

Bus lanes are a heavy-handed form of bus priority that obviate themselves if they are successful at reducing traffic congestion. Meanwhile, without a decently-sized verge, there is no space for safe bus stops, so passengers will be forced to unsafely board from and alight into the cycleway. And without space for loading bays, delivery vans will likely park on the narrow verge and also block the cycleway. People cycling will be forced to go in front of buses, defeating the whole point of a bus lane. The 'lengthy bus lane' approach of 'Final Concept' has the risk of producing a 20th-century-style white elephant. In contrast, bus priority via smart junction design doesn't suffer from these problems, and is a distinctly modern approach that leaves room for good trees, verges, bus stops, cycleways and footways.

By supporting this modification to the officers' recommendation you will be helping to hand down a proud legacy to the next generation, a world-class street that works for everyone, not merely controversial stretches of tarmac that will be rendered redundant even as they are built.

## **APPENDIX: discussion of data, graphs and diagrams from the report**

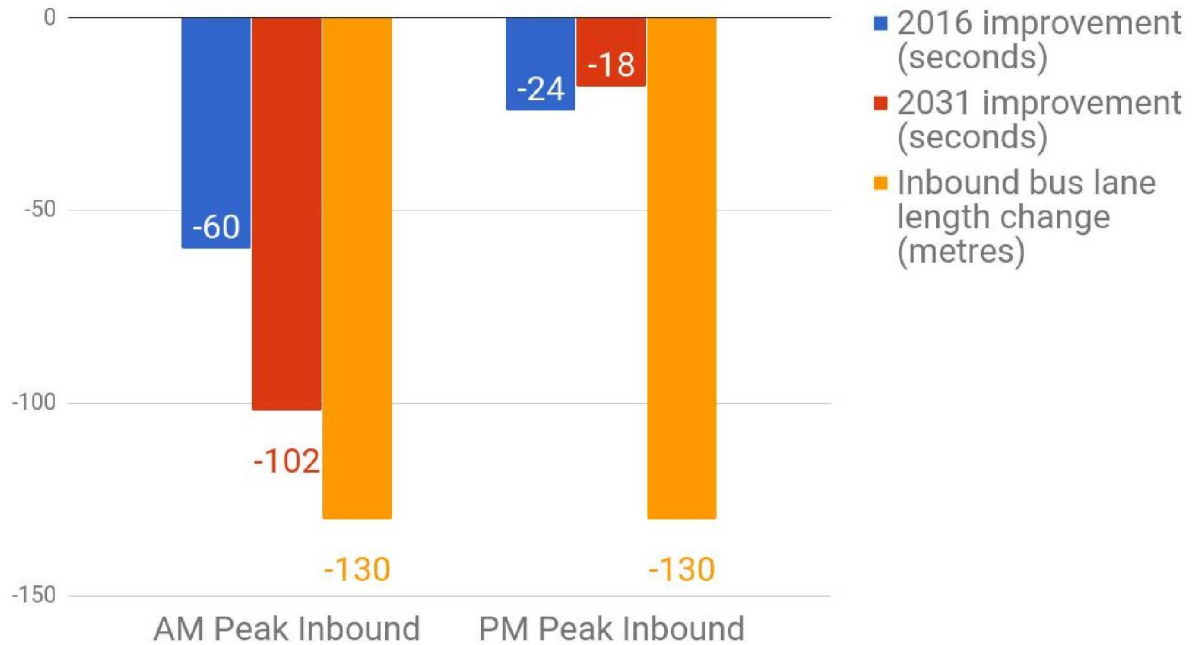
### **SUMMARY OF CHANGES IN BUS LANE LENGTHS**

<b>BUS LANE DIRECTION</b>	<b>Current</b>	<b>Final Concept</b>	<b>Difference</b>
<b>OUTBOUND</b>	<b>110 metres</b>	<b>430 metres</b>	<b>+320 metres</b>
<b>INBOUND</b>	<b>1015 metres</b>	<b>885 metres</b>	<b>-130 metres</b>
<b>TOTAL</b>	<b>1125 metres</b>	<b>1315 metres</b>	<b>+190 metres</b>

The difference between 'Do Nothing' and 'Final Concept' bus lane lengths is shown in Appendix F of the official report. Overall there is an increase, but the inbound bus lane is shortened by 130 metres in the 'Final Concept' scheme compared to 'Do Nothing'. The remainder of this appendix will discuss the inbound side of the road only to show that a decrease in bus lane length is compatible with improved bus journeys.

**Chart 1**

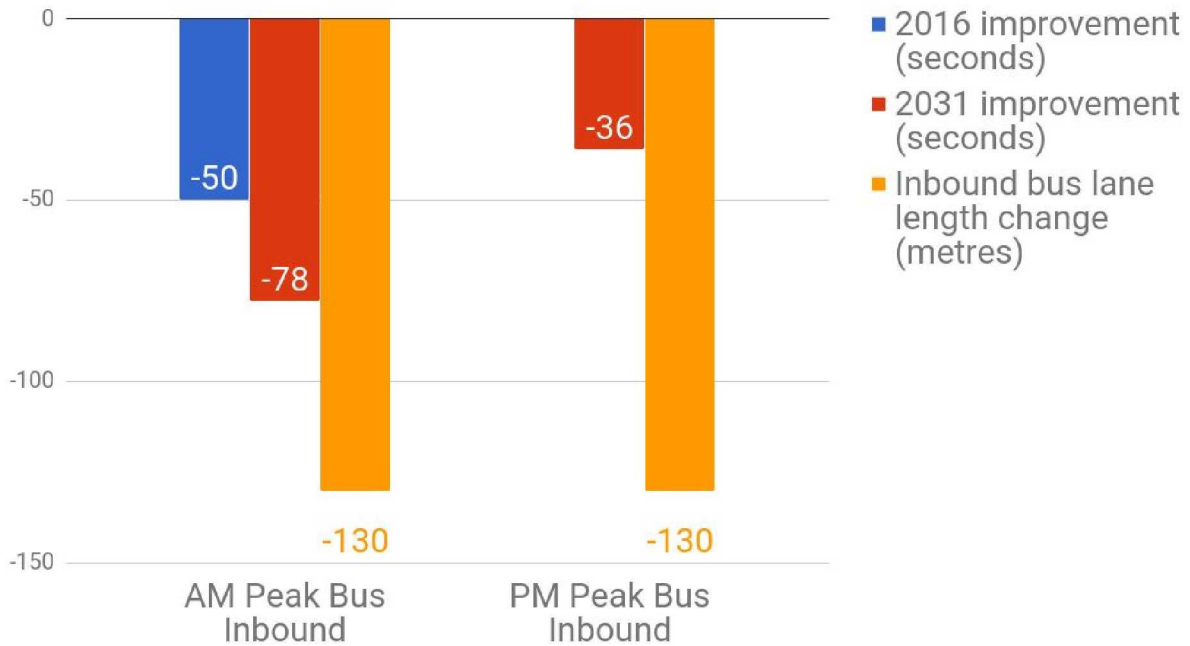
'Final Concept' Inbound All Vehicle Improvement from 'Do Nothing' at Peak Time Period



Inbound journey times improve for all vehicles and the inbound bus lane is shortened, compared to 'Do Nothing'. The morning inbound journey shows the greatest improvement and, intriguingly, gets better in the year 2031. The evening inbound journey slightly worsens in 2031 compared to 2016, but is still better than 'Do Nothing'.

**Chart 2**

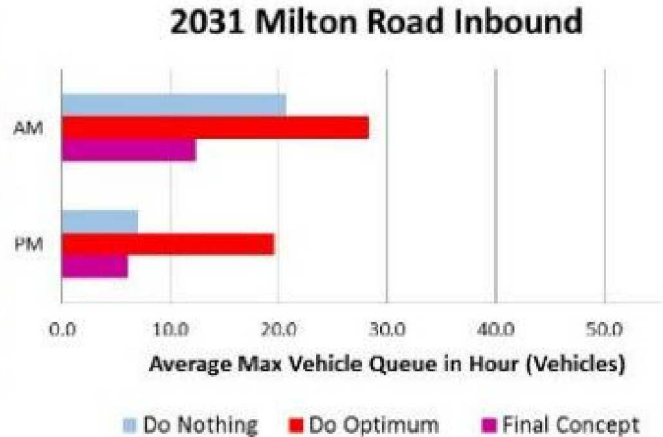
'Final Concept' Inbound Bus Improvement from 'Do Nothing' at Peak Time Periods



Focusing on the bus results: inbound bus journey times improve even as the inbound bus lane is shortened, compared to 'Do Nothing'. Morning inbound bus journeys are predicted to see the most improvement, and continue to improve through 2031. Evening inbound bus journeys in 2031 are also better than 'Do Nothing'. The comparison figures for 2016 bus journeys are not written into the report so they cannot be shown here. We believe that further shortening of bus lanes can be undertaken without overly affecting bus journeys.



## Example from the report: Gilbert Road Junction (2031)



Predicted average maximum motor vehicle inbound tailbacks for 'Final Concept' in the morning and evening are 12 and 6 vehicles respectively, both better than any other alternative. Current 'Final Concept' plans for the bus lane approaching Gilbert Road inbound call for it to be about 40 car-lengths long, far more than could ever possibly be needed.



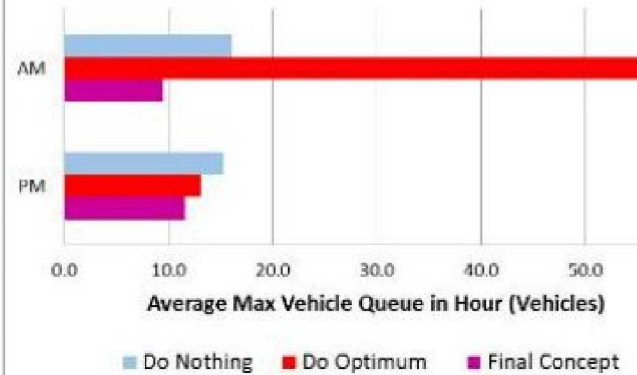
This diagram shows the length of a 12 car queue at Gilbert Road junction, which is the predicted average maximum tailback in 2031. Significantly shorter than proposed bus lane.

And in reality, the existing bus lane on Milton Road approaching Gilbert Road today is almost entirely unused by buses, save for when they have to pull into a bus stop.

## Example from the report: Arbury Road Junction (2031)



2031 Milton Road Inbound



Predicted average maximum motor vehicle inbound tailbacks for 'Final Concept' in the morning and evening respectively are 9 and 12 respectively, both better than any other alternative. Current 'Final Concept' plans for the bus lane approaching Arbury Road inbound call for the bus lane to be about 140 car-lengths long, all the way back to Woodhead Drive.



This diagram shows the length of a 12 car queue at Arbury Road junction, which is the predicted average maximum tailback in 2031. Significantly shorter than proposed bus lane.

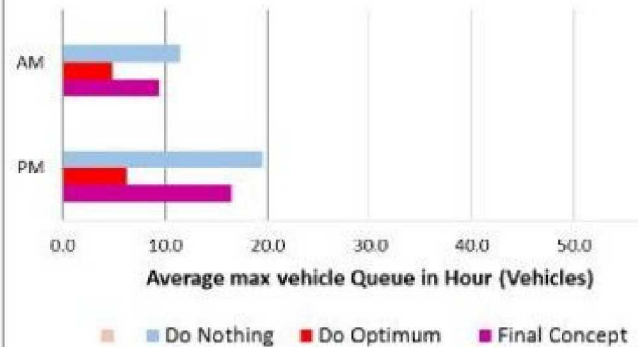
In reality, longer inbound queues tend to form at this junction when a motorist is stuck trying to make a right turn onto Arbury Road: that one car can hold up the whole queue for an entire traffic light cycle, and lead to a build-up. This technical problem is corrected by both 'Final Concept' and 'Do Optimum' and should not be a cause of queues anymore after the new scheme is implemented.



## Example from the report: King's Hedges Road junction (2031)



2031 Milton Road Inbound



Predicted average maximum motor vehicle inbound tailbacks for 'Final Concept' in the morning and evening respectively are 10 and 16 respectively, both better than 'Do Nothing' but both worse than the roundabout proposed in 'Do Optimum' (to be fair, the model says that this advantage for 'Do Optimum' comes at the expense of long queues on King's Hedges Road).

Current 'Final Concept' plans do not propose a bus lane approaching King's Hedges Road junction at all, but in this case the 'Do Optimum' plan does propose an inbound bus lane leading towards this junction inbound on Milton Road. This is an example where the modelling reveals that 'Do Optimum' may have proposed an excessive length of bus lane.

