Newport Strategic Junction Improvements – St Marys

1.0 Background

1.1 The Ministry of Housing, Communities & Local Government has made available £9.2m of transport infrastructure funding to the council to allow the early delivery of improvements which will enable the delivery of new homes and boost economic productivity on the Island**.**

1.2 In 2010 the council commissioned consultant engineers, Mott McDonald to establish what improvements would be necessary to the strategic road network in and around Newport to accommodate the predicted increase in vehicle movements generated by future housing and commercial development. They reviewed and updated the Newport Traffic Model and tested a number of options ultimately recommending a package of improvements. These were detailed in the Newport Traffic Model Update Report published 2010, an extract of which you can view here: https://www.iwight.com/azservices/documents/2782-Newport%20Traffic%20Model%20Update%20-%202010.pdf

1.3 It was intended that these works would be funded through development contributions from the new development and a requirement for such was noted in the Island Plan background document published in April 2011: https://www.iwight.com/azservices/documents/2782-FB3-Indicative-Economic-Viability-Assessment.pdf . However the infrastructure funding now secured allows an earlier start on the delivery of the improvements with the intention that proportionate planning contributions will be secured from the developments as those come forward.

1.4 Given the passage of time since the 2010 report and additional work on the potential location of housing sites some further work is being undertaken through a commission with consultants WYG to establish whether or not the junction improvements thought necessary in the 2010 update remain appropriate to accommodate the anticipated growth in traffic up to 2034. That work will inform the review of The Island Plan core strategy which will currently be consulted on in June 2018.

2.0 St Mary's Junction

2.1 Whilst the recommendations of the Mott McDonald work and detail of the package of improvements within Newport are currently being reviewed, the improvements identified in the earlier work at St Mary's have been revisited and a preferred option distilled from that.

2.2 Three options have been considered for the improvement of the St Mary's junction to reduce bus journey times between Cowes and Newport, improve cycling and pedestrian access to the hospital, reduce traffic delays and facilitate easier access to Medina Way from Forest Road, Hunnyhill and Dodnor Park:

1. Retention of the existing arrangement
2. Realignment and Signalisation of Forest Road Junction
3. Realignment and Signalisation of Forest Road Junction and St Mary's Roundabout

2.3 Both options 2 and 3 provide for the introduction of a signal controlled pedestrian crossing on Hunnyhill and provision of a new cycle link connection between Hunnyhill and the Hospital. The schemes are detailed on the consultation drawing at: https://www.iwight.com/documentlibrary/view/st-marys-junction-improvement-consultation-plan

2.4 The improvement requires land from the hospital site, release of which has been agreed by the NHS Trust Board and confirmed by the Department of Health. Similarly agreement has been reached with the Ministry of Justice to secure a narrow strip of land associated with the prison estate which will allow extension of the off road cycleway to the signal controlled crossing to the hospital.

3.0 Traffic Modelling / Capacity Analysis

3.1 The findings of the traffic modelling of these options in both the 2017 base year and 2032 future year is reported below:

Option 1: Retention of the Existing Arrangement

St Mary's Roundabout Results – Existing Junction Base Year (2017)

Approach	2017 Existing Junction Base Year Assessment			
	AM Peak (08:00-09:00)		PM Peak (17:00-18:00)	
	RFC	Queue (PCU)	RFC	Queue (PCU)
1 - Dodnor Ln	0.35	0.6	0.37	0.6
2 - Medina Way (S)	0.73	2.8	0.45	0.8
3 - Parkhurst Rd	0.77	3.3	0.34	0.5
4 - Medina Way (N)	0.71	2.5	0.60	1.5

3.2 The key column here is the 'RFC' which reports the ratio of flow to capacity on each of the approaches to the roundabout. A junction is considered to be operating at capacity when the RFC is 0.85. Once the RFC exceeds 1 then the junction is operating in excess of absolute capacity and will experience significant queuing and delay. The queue length is expressed in terms of 'passenger car units' (PCU).

3.3 The existing junction base year results indicate that the junction operates within capacity during the AM and PM peaks, with the maximum Ratio of Flow to Capacity (RFC) of 0.77.

St Mary's Roundabout Results – Existing Junction Future Year (2034)

Approach	2034 Existing Junction Future Year Assessment			
	AM Peak (08:00-09:00)		PM Peak (17:00-18:00)	
	RFC	Queue (PCU)	RFC	Queue (PCU)
1 - Dodnor Ln	0.47	0.9	0.72	2.5
2 - Medina Way (S)	0.93	11.4	0.83	4.8
3 - Parkhurst Rd	1.15	76.6	0.69	2.1
4 - Medina Way (N)	0.97	16.5	1.15	131.5

3.4 The existing junction future year results indicate that the junction will operate over capacity in both peak periods, with the maximum Ratio of Flow to Capacity (RFC) of 1.15 on Parkhurst Rd in the AM peak, and 1.15 on the north approach of Medina Way in the PM peak.

Option 2: Realignment and Signalisation of Forest Road Junction

St Mary's Roundabout Results – Base Year (2017)

Approach	2017 Proposed Base Year Assessment			
	AM Peak (08:00-09:00)		PM Peak (17:00-18:00)	
	RFC	Queue (PCU)	RFC	Queue (PCU)
1 - Dodnor Ln	0.35	0.6	0.68	2.1
2 - Medina Way (S)	0.74	2.9	0.62	1.6
3 - Parkhurst Rd	0.21	0.3	0.19	0.2
4 - Medina Way (N)	0.83	4.9	0.79	3.6

3.5 The proposed scheme will lead to a reduction of vehicles entering and exiting the roundabout from the Parkhurst Road arm. Consequently, there will be a significant reduction in the RFC during both the AM and PM peaks, on Parkhurst Road. However, Medina Way (N) will be negatively affected due to the increase in traffic from the traffic diverted from Forest Rd, but the arm will still operate within capacity.

St Mary's Roundabout Results – Future Year (2034)

Approach	2034 Proposed Future Year Assessment			
	AM Peak (08:00-09:00)		PM Peak (17:00-18:00)	
	RFC	Queue (PCU)	RFC	Queue (PCU)
1 - Dodnor Ln	0.45	0.9	1.02	24.6
2 - Medina Way (S)	0.93	11.7	0.79	3.6
3 - Parkhurst Rd	0.33	0.5	0.28	0.4
4 - Medina Way (N)	1.09	88.4	0.97	20.0

3.6 The modelling indicates that the increase in traffic due to the growth and the reassignment of traffic from Forest Road into Medina Way puts further pressure on the junction. Medina Way (S) arm is operating close to capacity with an RFC of 0.93 on the AM peak. Medina Way (N) is expected to be operating above its theoretical capacity on the AM peak and operating close to capacity on the PM peak.

Forest Road/ Medina Way Results – Base Year (2017)

Arm Cycle time :72 seconds	AM Peak			PM Peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1 - Medina Way (S)	55.4%	7.4	14.3	59.5%	7.9	13.2
2 - Forest Rd	53.4%	3.3	27.2	59.2%	3.0	37.1
3 - Medina Way (N)	36.7%	4.4	11.1	55.3%	5.5	10.9
PRC	62.6%			51.2%		
Total Delay (pcu/hr)	13.37			15.29		

3.7 For traffic signal junctions the model findings are reported in terms of degree of saturation rather that RFC as is used for roundabouts. These are not directly comparable although the key row in the above table is the ' PRC' – Practical Reserve Capacity.

3.8 This analysis shows that the proposed signalised junction will operate within capacity with an overall Practical Reserve Capacity (PRC) of 62.6% in the AM peak and 51.2% in the PM peak.

3.9 Capacity could be further increased by extending the cycle time which would increase queue lengths but reduce overall delay. This results from the way in which traffic signals work. Such junction controls release platoons of vehicles to pass through the junction without conflict compared with a simple priority junction or roundabout where each driver pauses at the give way line and must make a judgement about whether or not they can proceed. As a consequence whilst traffic queues form at signals the actual number of vehicles that can pass through a traffic signal controlled junction in any given period is much greater than for a simple priority junction or roundabout. Increasing the 'cycle' time simply reduces the number of times the lights will change in any given period consequently reducing the overall red/ amber time whilst increasing the overall green time available thus increasing the capacity of the junction overall at the cost of longer queues forming in each cycle.

Forest Road/ Medina Way Results – Future Year (2034)

Arm Cycle time :72 seconds	AM Peak			PM Peak		
	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
1 - Medina Way (S)	66.5%	9.7	15.9	72.0%	10.5	15.2
2 - Forest Rd	64.5%	4.2	30.2	71.3%	4.0	43.1
3 - Medina Way (N)	44.6%	5.7	11.8	67.3%	7.4	12
PRC	35.4%			25.0%		
Total Delay (pcu/hr)	15.46			18.37		

3.9 The future year findings show that the junction will operate with 25% practical reserve capacity in the pm peak period.

Option 3 : Realignment and Signalisation of Forest Road Junction and St Mary's Roundabout

Base Year - 2017

Arm Cycle time :72 seconds		AM Peak			PM Peak		
		Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
Forest Road/ Medina Way	1.1 - Medina Way (S)	59.9%	2.8	8.2	59.5%	2.8	7.1
	1.2 – Forest Road	58.8%	2.1	4.0	60.6%	2.0	2.8
	1.3 - Medina Way (N)	41.5%	1.2	5.3	45.7%	1.1	5.6
St Mary's Roundabout	2.1 - Medina Way (S)	65.3%	9.5	10.3	57.5%	7.6	12.1
	2.2 – Parkhurst Road	35.4%	1.4	6.4	44.4%	1.8	6.3
	2.3 - Medina Way (N)	65.7%	8.4	19.5	52.9%	6.3	6.5
	2.4 – Dodnor Road	36.3%	2.8	24.2	67.2%	3.4	10.6
PRC		36.9%			34.0%		
Total Delay (pcu/hr)		33.86			35.79		

Future Year - 2034

Arm		AM Peak			PM Peak		
		Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)	Deg Sat (%)	Mean Max Queue (pcu)	Av. Delay Per PCU (s/pcu)
Forest Road/ Medina Way	1.1 - Medina Way (S)	73.3%	4.1	11.5	64.6%	3.1	7.0
	1.2 – Forest Road	71.7%%	3.1	4.6	76.0%	3.4	4.9
	1.3 - Medina Way (N)	51.%	1.6	7.2	55.3%	1.8	8.0
St Mary's Roundabout	2.1 - Medina Way (S)	79.3%	14.3	14.1	66.7%	9.7	13.8
	2.2 – Parkhurst Road	55.4%	3.0	14.5	66.0%	4.0	13.2
	2.3 - Medina Way (N)	69.3%	9.8	17.3	72.4%	11.5	9.5
	2.4 – Dodnor Road	55.3%	3.9	31.5	83.0%	6.9	20.2
PRC		13.6%			8.4%		
Total Delay (pcu/hr)		50.51			52.98		

3.10 This analysis finds that if both junctions were signalised then they would operate within capacity in both the base and future year scenarios and will be able to accommodate the anticipated increase in traffic and ensure that regeneration and the future delivery of new homes was not frustrated.

4.0 Consultation

4.1 In addition to the online consultation local residents have been written to directly to inform them of the emerging proposals and Island Roads will be undertaking two days of on-site consultation on 30th and 31st January between 2 and 7 pm. The mobile exhibition unit will be parked on the foot-way area outside numbers 49 and 51 Parkhurst Road, Newport where the scheme details will be on display. Island Roads representatives will be at the unit to answer any questions you may have.

4.2 In order to inform the detailed design and to ensure that the views of local people and businesses have been considered, the council is asking you to email your thoughts to : highways-pfi@iow.gov.uk and use the heading 'St Mary's Junction'. Forms will also be available for you to provide feedback at the mobile exhibition or alternatively you can post your comments in writing by 21 February to:

Bill Murphy
Head of Contract Management
St. Christopher House
42 Daish Way, Newport
Isle of Wight, PO30 5XJ

5.0 Delivery Programme

5.1 Implementation has been provisionally programmed for delivery in 2018 in a number of phases to minimise disruption as shown on the phasing plan at this link: https://www.iwight.com/documentlibrary/view/st-marys-junction-phasing-plan1

This allows for the works to be scheduled in the knowledge of major planned events on the island such as Festival and Cowes Week.