5 SCENARIO APPRAISAL

5.1 INTRODUCTION

- 5.1.1. Each scheme has been tested within the 2026 Do Minimum model and this chapter focuses on a comparison of each of the scheme scenarios with respect to 2026 Do Minimum scenario (DM). For each scenario the following performance statistics are considered:
 - Change in traffic flow
 - Change in delay
 - Volume / capacity ratio
 - Select Link Analysis (where appropriate)
- 5.1.2. In addition to the plots presented within Section5, Appendix C provides additional plots, and reference to these is made throughout this section.
- 5.1.3. For each scenario there is a comparison against network summary statistics. Appendix D provides the full network summary statistics for all the scenarios:
- 5.1.4. These statistics include the following:
 - Transient Queues (PCU-Hrs)
 - Over-capacity Queues (PCU-Hrs)
 - Link Cruise Time (PCU-Hrs)
 - Total Travel Time (PCU-Hrs)
 - Total Travel Distance (PCU-kms)
 - Average Speed (kph)

5.2 SCENARIO 1 - HARDINGS WAY

5.2.1. The primary impact of opening of Hardings Way is the redistribution of traffic within the town as a result of the new route choice introduced to the network. Figure 5-1 shows the traffic flow differences between Scenario 1 and DM for the AM Peak in 2026.



Figure 5-1: Scenario 1 - DM Actual Flow Difference Plot AM Peak

- 5.2.2. Figure 5-1 shows that an increase in traffic on Hardings Way is anticipated due to the removal of the ban, with traffic redistributing to this route away from Railway Road. Additionally, there is a similar reassignment of traffic onto Wisbech Road, instead of A148, connecting the A47 Road with King's Lynn Town Centre. There is also an associated increase in traffic on South Quay and King Street, with a decrease within the gyratory.
- 5.2.3. Overall the changes in flow have limited impact upon network delay and this is illustrated in Figure C.1-2 of Appendix C. There are minor reductions to delays on Railway Road and the network surrounding it during the AM Peak, however these are balanced by minor increases in delay associated with increased traffic in the vicinity of Hardings Way.

- 5.2.4. There is limited impact on link capacity, with a small number of links with a high V/C ratio (above 85%), and thus a poor level of service and they are illustrated on Figure C.1-3 of Appendix C. This highlights likely congestion at junctions including Hardings Way with Boal Street, and Purfleet Place with King Street.
- 5.2.5. In the PM the reassignment of traffic is very similar to the AM. There is an increase in traffic on Hardings Way Southbound as anticipated due to the removal of traffic bans on it, with traffic redistributing to this route from Railway Road and from B1144 Road. Unlike in the AM there is limited redistribution to King Street and this is illustrated in Figure C.1-4.
- The delay comparison of between Scenario 1 and DM for PM Peak in 2026 show greater impacts 5.2.6. than in the AM as demonstrated in Figure 5-2.

Delay (s): increased 🖊 Delay (s): decreased



ors Contains Ordnance Survey data © Crown copyright and database right 2010-15., WSF aflet I © Or

Figure 5-2: Scenario 1 - DM Delay Difference Plot PM Peak

- 5.2.7. Figure 5-2 shows that there is an increase in delay on Hardings Way southbound. This is due to the rise in traffic exiting on Wisbech Road and heading towards Southgates junction. Signal optimisation at this junction could potentially reduce this delay. Figure C.1-6 shows the corresponding Volume/Capacity ratio as a percentage for Scenario 1 in the PM Peak in 2026.
- 5.2.8. There are a few links where the V/C ratio falls in the range of 90-100%, which is a high V/C ratio and will lead to congestion and a poor level of service during the PM Peak, especially at Southgate's roundabout.

SELECT LINK ANALYSIS

5.2.9. Select Link Analysis has been undertaken along Hardings Way to understand the routing of traffic using the road.

thickness)



Figure 5-3: Scenario 1 Select Link Analysis AM Peak Hardings Way Northbound

5.2.10. Figure 5-3 shows the routing of traffic on Hardings Way Northbound within Scenario 1. A considerable amount of traffic uses South Quay and then King Street in the AM Peak. Consideration should be given as to whether this level of reassignment is desirable given the nature of the King Street and surrounding roads. Figure 5-4 provides the corresponding information for the evening peak period.



Actual_Flow_Total (PCUs): (in thickness) Timeband: PM Peak (17:00 - 18:00) 2026 Op1 2121-2146 SL

Figure 5-4: Scenario 1 Select Link Analysis PM Peak Hardings Way Southbound

5.2.11. Figure 5-4 shows that there is a high number of vehicles that use Hardings Way southbound in the PM peak, particularly those heading west out of King's Lynn and using Wisbech Road.

SCENARIO 1 NETWORK SUMMARY STATISTICS

5.2.12. Table 5-1 presents network summary statistics for Scenario 1 and a comparison against the Do Minimum case.

		DM		Scenario 1		Scenario 1 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	РМ
Transient Queues	PCU - Hrs	512.1	599.4	486.6	585.6	-25.5	-13.8
Over-capacity Queues	PCU - Hrs	23.5	39.4	28.7	32.6	5.2	-6.8
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1236.5	1335.3	-1.0	6.0
Total Travel Time	PCU - Hrs	1773.1	1968.1	1751.8	1953.5	-21.3	-14.6
Total Travel Distance	PCU - kms	71087.6	75434.8	70974.4	75587.7	-113.2	152.9
Average Speed	kph	40.1	38.3	40.5	38.7	0.4	0.4

Table 5-1: Scenario 1 Network Summary Statistics

5.2.13. Table 5-1 shows that Scenario 1 has a positive impact on levels of queuing and reduces total travel times whilst speeds increase.

SCENARIO 1 SUMMARY

5.2.14. Scenario 1 causes traffic levels using London Road to reduce by over 400 PCUs northbound in the AM by causing reassignment to Hardings Way and King Street. In the PM the scheme causes an increase in traffic on Hardings Way southbound as well as the gyratory southbound. One of the main delay impacts is in the PM at the Hardings Way / Wisbech Road signalised junction, although signal optimisation may alleviate this.

5.3 SCENARIO 2 - HARDINGS WAY COMPLIMENTARY MEASURES

5.3.1. Scenario 2's primary impact also the reassignment of traffic. Figure 5-5 shows the traffic flow difference between Scenario 2 and the Do Minimum Network in 2026 for AM Peak, and thus the wider reassignment impact of the proposals.



Figure 5-5: Scenario 2 - DM Actual Flow Difference Plot AM Peak (Wider Area)

- 5.3.2. Figure 5-5 shows that in 2026 there are increase in traffic on Wisbech Road and decrease of traffic on A47 and on Edward Benefer Way. It can be seen that in 2026 there is an increase in traffic on Hardings Way due to opening the road to traffic. This results in a decrease in traffic movements between the A148/ London Road junction and London Road / St James Street junction. Traffic on Railway Road increases, due to the banning of both direction movements for traffic on King Street. Additionally, traffic on B1144 Road increase in the southbound direction. Figure C.2-7 of Appendix C shows the traffic flow difference between Scenario 2 and the Do Minimum Network in 2026 for the AM Peak period although zoomed in on the town centre.
- 5.3.3. Despite these changes in flow there is minimal impact on delay and this is illustrated in Figure C.2-9. Figure C.2-9 shows there is reduction in delay on London Road and the surrounding roads. Additionally, there is an increase in delay of 8 seconds at the junction of Hardings Way with Boal Street. Whilst not significant, this is a consequence of the increased traffic through this junction.

- 5.3.4. The network level of service in King's Lynn Town Centre is generally good, Figure C.2-10 shows the Volume/ Capacity ratio as a percentage in Scenario 2. Whilst there are a few instances, where links are above capacity, namely Purfleet Place and King Street, in most cases links are well below operating capacity. On London Road there are a couple of links with a range of 70-85% of its capacity and the St James' Road approach to the junction of London Road with Blackfriars Road is at 90% so nearing full capacity.
- 5.3.5. Figure 5-6 shows the flow difference plot between Scenario 2 and the Do Minimum in 2026 for the PM Peak.



Figure 5-6: Scenario 2 - DM Actual Flow Difference Plot PM Peak

- 5.3.6. Figure 5-6 shows a decrease in flow on the A47 and an increase on Wisbech Road leading to A47 Road through Clenchwarton Road. Additionally, there is a reduction of traffic on Edward Benefer Way. There is a decrease in flow on London Road southbound. The decrease in traffic is due to the opening of the Hardings Way, which provides the network with additional capacity. Similar increases in traffic can be seen on Wisbech Road instead of A148 Road, which connects the A47 Roads with King's Lynn Town Centre. Figure C.2-11 of Appendix C shows the traffic flow difference between Scenario 2 and the Do Minimum Network in 2026 for the PM Peak period although zoomed in on the town centre.
- 5.3.7. Over most of the town centre there are no significant delays, but there is an increase in delay of 16 seconds on Hardings Way Southbound. This is illustrated in Figure C.2-13 showing delay differences between Scenario 2 and the Do Minimum in 2026 for PM Peak.

5.3.8. In terms of the level of service at the St James' Road approach to the Railway Road / Blackfriars Road junction the V/C ratio reaches 85%. Additionally, at Southgates roundabout the London Road approach and exit arm of Hardwick Road reach V/C levels above 100. This is illustrated in Figure C.2-14.

SCENARIO 2 NETWORK SUMMARY STATISTICS

5.3.9. Table 5-2 presents network summary statistics for Scenario 2 and a comparison against the Do Minimum case.

		DM		Scenario 2		Scenario 2 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	PM
Transient Queues	PCU - Hrs	512.1	599.4	512.4	607.4	0.4	8.0
Over-capacity Queues	PCU - Hrs	23.5	39.4	31.8	37.3	8.3	-2.1
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1239.8	1334.9	2.3	5.5
Total Travel Time	PCU - Hrs	1773.1	1968.1	1784.0	1979.5	11.0	11.4
Total Travel Distance	PCU - kms	71087.6	75434.8	71278.4	75692.6	190.8	257.8
Average Speed	kph	40.1	38.3	40.0	38.2	-0.1	-0.1

Table 5-2: Scenario 2 Network Summary Statistics

5.3.10. Table 5-2 shows that Scenario 2 causes marginally more queuing, reduces average speeds and increases total travel time and distance.

SCENARIO 2 SUMMARY

5.3.11. Scenario 2 has similar routing impacts to Scenario 1 although reduces the traffic flow on King Street and encourages the use of the gyratory instead as a result of the link closure. Overall the complimentary measures to the link closure are having no positive impact on overall network performance.

5.4 SCENARIO 3 - HARDINGS WAY

5.4.1. The primary impact of Scenario 3 is also the reassignment of traffic away from London Road and Railway Road to Hardings Way. Figure 5-7 shows the traffic flow differences between Scenario 3 and DM for the AM Peak in 2026.



Figure 5-7: Scenario 3 - DM Actual Flow Difference Plot AM Peak Wider Area

- 5.4.2. Figure 5-7 shows a significant increase in traffic on Hardings Way in both directions due to the removal of traffic bans on it. This results in reduced traffic flows on London road and Railway Road. Furthermore, this option reduces the traffic on A148, which in turn increases the traffic on Wisbech Road and provides some relief to the A47 connecting these two roads.
- 5.4.3. There is a small increase in delay on Hardings Way in both directions and on King Street where a significant increase in traffic results in blocking the minor arm of the junction with Purfleet Place and leads to a delay of 31 seconds. This is illustrated in Figure C.3-17.
- 5.4.4. As illustrated in Figure C.3-18, there are no significant Volume/ Capacity issues within the King's Lynn Town centre except at the junction of Purfleet Place with King Street, where the junction experiences delay exiting onto the major arm.
- 5.4.5. Figure 5-8 shows the corresponding traffic flow differences between Scenario 3 and DM for the PM Peak in 2026.



Figure 5-8: Scenario 3 - DM Actual Flow Difference Plot PM Peak

- 5.4.6. Figure 5-8 shows that there is a significant increase in traffic on Hardings Way in both directions as a result of the removal of traffic bans on it. The reduces the traffic flow on London Road and Railway Road. Furthermore, it reduces the traffic on A148, in turn increasing the traffic on Wisbech Road whilst reducing the flow on the A47 road connecting between these two roads.
- 5.4.7. Over most of the town centre there are limited changes in delay. There are small decreases in delay on London Road, whilst there is an increase in delay of 36 seconds on Hardings Way southbound, as expected given the road has been opened to traffic. Figure C.3-21 illustrates this delay.
- 5.4.8. There are a number of junctions where a high V/C is observed within the King's Lynn Town centre, namely the junction of Purfleet Place with King street, Southgates roundabout, and Saturday Market Place. Figure C.3-22 illustrates the Volume/ Capacity ratio as a percentage for Scenario 3 in the 2026 PM Peak.

SELECT LINK ANALYSIS

5.4.9. Select Link Analysis has been undertaken to understand the routing of traffic that uses Hardings Way. The results of this Select Link Analysis are presented in Figure 5-9, Figure 5-10, Figure 5-11, and Figure 5-12.



Legend Traffic Flow Links / Actual_Flow_Total (PCUs): (in thickness) Timeband: AM Peek (8:00 - 9:00) 2026 Op3 2121-2146 SL

right and database right 2010-15., WSP

 Figure 5-9:
 Scenario 3 - Select Link Analysis AM Peak Hardings Way Northbound



Figure 5-10: Scenario 3 - Select Link Analysis PM Peak Hardings Way Northbound



Figure 5-11: Scenario 3 - Select Link Analysis AM Peak Hardings Way Southbound

Legend

Traffic Flow Links
Actual_Flow_Total (PCUs): (in thickness)
Timeband: AM Peak (8:00 - 9:00)
2026 Op3 2146-2121 SL

copyright and database right 2010-15., WSP



Legend

Traffic Flow Links
Actual_Flow_Total (PCUs): (in thickness)
Timeband: PM Peak (17:00 - 18:00)
2026 Op3 2146-2121 SL

and database right 2010-15., WSP

Figure 5-12: Scenario 3 - Select Link Analysis PM Peak Hardings Way Southbound

5.4.10. Traffic using Hardings Way routes through Wisbech Road, London Road, and King's Street. Only a small number of vehicles use Hardings Way route through the town centre via the Railway Road gyratory area.

SCENARIO 3 NETWORK SUMMARY STATISTICS

5.4.11. Table 5-3 presents network summary statistics for Scenario 3 and a comparison against the Do Minimum case.

		DM		Scenario 3		Scenario 3 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	РМ
Transient Queues	PCU - Hrs	512.1	599.4	488.2	568.9	-23.9	-30.5
Over-capacity Queues	PCU - Hrs	23.5	39.4	28.3	33.9	4.8	-5.4
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1238.0	1337.6	0.4	8.3
Total Travel Time	PCU - Hrs	1773.1	1968.1	1754.4	1940.5	-18.7	-27.6
Total Travel Distance	PCU - kms	71087.6	75434.8	70955.0	75563.7	-132.6	128.9
Average Speed	kph	40.1	38.3	40.4	38.9	0.4	0.6

Table 5-3: Scenario 3 Network Summary Statistics

5.4.12. Table 5-3 shows that Scenario 3 has a positive impact on total travel times and queueing as these are reduced. Average speeds are also seen to increase.

SCENARIO 3 SUMMARY

5.4.13. Like Scenarios 1 and 2, Scenario 3 has a significant impact on the traffic levels using London Road and Railway Road by causing significant reassignment to Hardings Way and King Street. There is a reassignment from the A148 to Wisbech Road, and this reduces traffic on the A47 between the A47 / A17 junction and the A47 / A148 junction.

5.5 SCENARIO 4 - HARDINGS WAY COMPLIMENTARY MEASURE

5.5.1. Scenario 4's primary impact is the reassignment of traffic given the new route choice provided by the opening of Hardings Way. Figure 5-13 shows the traffic flow differences between Scenario 4 and DM for AM Peak in 2026.



Figure 5-13: Scenario 4 - DM Actual Flow Difference Plot AM Peak

- 5.5.2. Figure 5-13 shows that there is a significant increase in traffic on Hardings Way in both the directions due to the removal of traffic bans on it, which reduces traffic flows on London Road. There is also a reduction in traffic flow at King Street which results in the increase of traffic on Railway Road. Furthermore, shows a significant increase on Wisbech Road with a countering reduction in traffic on A148 Road. Figure C.4-25 shows the corresponding delay difference plot between Scenario 4 and the Do Minimum in the 2026 AM Peak. Figure C.4-25 shows that there is a decrease in delay on London Road and the adjacent areas, and minor increase of delay on Hardings Way in both directions. The largest increase is seen at Purfleet Place where the is an increase of 14 seconds.
- 5.5.3. There are a small number of links where V/C is close to or exceeding capacity within the King's Lynn Town centre, namely Purfleet Place with King Street junction and the junction of at Loke Road with Gaywood Road this is illustrated in Figure C.4-26.
- 5.5.4. Figure 5-14 shows the traffic flow differences between Scenario 4 and DM in the PM Peak 2026.



Figure 5-14: Scenario 4 - DM Actual Flow Difference Plot PM Peak

- 5.5.5. Figure 5-14 shows a significant increase in traffic on Hardings Way in both directions due to the removal of traffic bans on it, which reduces traffic levels on London Road. There is also reduction in traffic flow along King Street, due to the traffic ban, leading to an increase in traffic on Railway Road.
- 5.5.6. It also shows a significant increase in traffic on A47 Road in one direction as expected. There is also a significant reduction in traffic flow at Edward Benefer Way.
- 5.5.7. In this scenario there are decreases in delay on London Road and the adjacent areas, and significant increase in delay on Hardings Way of 19 seconds southbound. This is illustrated on Figure C.4-29. Although not shown on this figure there is a small increase of 11 seconds on Queen Elizabeth Road as a result of the proposed mitigation.
- 5.5.8. There are a few links where the volume/capacity is at or nearing capacity within the King's Lynn Town Centre, namely the junction of Saturday Market Place with Church Street. This is illustrated in Figure C.4-30.

SCENARIO 4 NETWORK SUMMARY STATISTICS

5.5.9. Table 5-4 presents network summary statistics for Scenario 4 and a comparison against the Do Minimum case.

		DM		Scenario 4		Scenario 4 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	РМ
Transient Queues	PCU - Hrs	512.1	599.4	514.6	598.0	2.5	-1.4
Over-capacity Queues	PCU - Hrs	23.5	39.4	32.8	37.5	9.3	-1.9
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1239.9	1333.5	2.3	4.1
Total Travel Time	PCU - Hrs	1773.1	1968.1	1787.2	1968.9	14.2	0.8
Total Travel Distance	PCU - kms	71087.6	75434.8	71260.5	75615.6	172.9	180.8
Average Speed	kph	40.1	38.3	39.9	38.4	-0.2	0.1

Table 5-4: Scenario 4 Network Summary Statistics

5.5.10. Table 5-4 shows that there is an increase in over capacity queues in the AM, although a small reduction in the PM. This leads to increased overall travel times and distance.

SCENARIO 4 SUMMARY

5.5.11. Scenario 4 has similar impacts to Scenario 1 to 3, with increased traffic on Hardings Way resulting in in traffic routing through South Quay and avoiding London Road. In common with Scenario 2 the closure of King's Street leads to increased traffic on Railway Road.

5.6 SCENARIO 5 - TRAFFIC SIGNALS

5.6.1. The appraisal of the junction of John Kennedy Road / Loke Road is likely to be impacted by the lower than observed traffic flow that was identified in the validation screenline across this road. Given in the base model this road has less traffic than observed, the patterns seen in this Scenario would likely persist if the base model performed better in this location, and it is likely the effects seen would be more pronounced given the increased traffic levels.



Figure 5-15: Scenario 5 – Actual Flow Difference Plot AM Peak

5.6.2. Figure 5-15 shows the flow difference plot between Scenario 5 and the Do Minimum in 2026 for the AM Peak. It shows that there is a decrease in flow on London Road and on King Street, and in turn a significant increase in traffic on the B1144 road. This is a result of the improved performance of the roundabout (compared to existing traffic signals) which resulted in the elimination of cyclic delay occurring due to the presence of signals in the base year model. There is also a significant reduction (100+ vehicles) on Gaywood Road approaching the gyratory and a large increase on Tennyson

Avenue (80+ vehicles). It shows that a decrease in flow on the A149 Road and Edward Benefer Way, and counter increase in flow on B1144 Road and Reid Way.

- 5.6.3. In the AM a reduction in delay is observed adjacent to the roundabout scheme for the junction of Loke Road with Gaywood Road and also a reduction of delay on London Road. There is a reduction of 15 seconds on Gaywood Road westbound. This is illustrated in Figure C.5-33. To the edge of the figure there is an increase of 29 seconds on Gayton Road.
- 5.6.4. There are only a couple of links at or exceeding capacity and therefore have high Volume/ Capacity ratios, namely London Road north of Vallingers Road and A1076 Gayton Road. These are shown in Figure C.5-35.
- 5.6.5. Figure 5-16 shows the flow difference plot between Scenario 5 and the Do Minimum in 2026 for the PM Peak.



Figure 5-16: Scenario 5 – DM Actual Flow Difference Plot PM Peak

- 5.6.6. The figure shows a decrease of flow on the London Road as a result of an increase in traffic on the B1144. This figure also shows there is no significant impact seen for PM period across wider area. There is a small increase in flow on the A148 and associated decrease in traffic on the Edward Benefer Way road and Field Way.
- 5.6.7. In terms of delay, over most of the network there are only small changes, however, there is a reduction of 30 seconds on Gaywood Road westbound. There are no significant changes in delay for traffic in the PM peak in the wider area. Figure C.5-38 illustrates these delay changes for the PM.
- 5.6.8. In terms of Volume/Capacity ratios, most links within King's Lynn during the PM Peak are well within capacity. However, Southgates roundabout does have multiple arms with Volume Capacity ratio's above 85%. These volume/capacity ratios on a link basis for Scenario 5 are illustrated in Figure C.5-40.

SCENARIO 5 NETWORK SUMMARY STATISTICS

5.6.9. Table 5-5 presents network summary statistics for Scenario 5 and a comparison against the Do Minimum case.

		DM		Scenario 5		Scenario 5 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	РМ
Transient Queues	PCU - Hrs	512.1	599.4	495.9	589.5	-16.2	-9.9
Over-capacity Queues	PCU - Hrs	23.5	39.4	25.7	36.6	2.2	-2.8
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1242.4	1333.3	4.9	4.0
Total Travel Time	PCU - Hrs	1773.1	1968.1	1764.0	1959.4	-9.1	-8.8
Total Travel Distance	PCU - kms	71087.6	75434.8	71076.5	75636.0	-11.1	201.2
Average Speed	kph	40.1	38.3	40.3	38.6	0.2	0.3

Table 5-5: Scenario 5 Network Summary Statistics

5.6.10. Table 5-5 shows that Scenario 5 has a positive impact on the level of transient queues and total travel time, and provides a small increase in average speeds.

SCENARIO 5 SUMMARY

5.6.11. The three different junction schemes cause a number of reassignments to occur, including changes in flow along Gaywood Road and Tennyson Avenue to Edward Benefer Way. The schemes provide a small reduction of traffic within the town centre / gyratory area, although some of the wider reassignment impacts are more significant (100+ vehicles per hour in some places). A set of sensitivity tests looking at each junction independently may be advisable to isolate the reassignment impacts to achieve desired rerouting. The increases in traffic along Loke Road are perhaps not desirable given the residential nature of the street.

5.7 GYRATORY – BLACKFRIARS ROAD TWO-WAY (SCENARIO 6)

- 5.7.1. Scenario 6 primarily has reassignment impacts, although a couple of links see some large delay increases.
- 5.7.2. Figure 5-17 shows the flow difference plot between Scenario 6 and the Do Minimum in 2026 for AM Peak.



Figure 5-17: Scenario 6 – DM Actual Flow Difference Plot AM Peak

- 5.7.3. There is a significant decrease in flow on London Road and Railway Road with counter increase of flow on B1144 Road and King Street. There is a decrease in flow of up to 182 PCUs observed on Edward Benefer Road, with counter increase in flow on A148 Road.
- 5.7.4. There is significant reduction in delay along Railway Road, however this is countered by some very significant increases, such as 302 seconds on Purfleet Place and 55 seconds on Gaywood Road. There is however a significant increase in delay at the Gaywood Road / Loke Road junction. There

are no significant changes in delay across the wider network. Figure C.6-43 illustrates the delay difference between Scenario 6 and the Do Minimum in 2026 for AM Peak.

- 5.7.5. In this scenario a few links have a poor level of service due to the increased flow, resulting in a V/C ratio more than 90%. Key links experiencing stress are: Vancouver Avenue Eastbound, Purfleet Place, Norfolk Street and Blackfriars Road between Norfolk Street and Portland Street. Figure C.6-45 shows the Volume/ Capacity ratio as a percentage for Scenario 6 in 2026 for AM Peak.
- 5.7.6. Figure 5-18 shows the flow difference plot between Scenario 6 and the Do Minimum in 2026 for PM Peak.



Figure 5-18: Scenario 6 – DM Actual Flow Difference Plot PM Peak

5.7.7. There is a significant reduction in flow on Railway Road (up to 1009 PCUs). In turn traffic on B1144 Road and King Street has increased. A reduction in flow of up to 151 PCUs is observed on Edward Benefer Way, in turn traffic on the A148 has increased.

- 5.7.8. There is a considerable increase of 62 seconds in delay on Gaywood Road Westbound at the junction with Loke Road, as well as the junction of Gaywood Road and Tennyson Avenue. There is also an increase in delay at the Blackfriars Road / Austin Street junction. The largest increase of 72 seconds is seen at Purfleet Place. There are no noticeable changes in delay across the wider area. These delays difference between Scenario 6 and the Do Minimum in 2026 for PM Peak are illustrated in Figure C.6-48.
- 5.7.9. Figure C.6-50 shows the Volume/ Capacity ratio as a percentage for Scenario 6 in 2026 for PM Peak. There are few links at or over capacity, namely Saturday Market Place, Purfleet Place, the Southgates roundabout and Blackfriars Road. Approach arms to the Gaywood Road / Tennyson Avenue roundabout also have volume capacity ratios over 90%.

SCENARIO 6 NETWORK SUMMARY STATISTICS

5.7.10. Table 5-6 presents network summary statistics for Scenario 6 and a comparison against the Do Minimum case.

		DM		Scenario 6		Scenario 6 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	РМ
Transient Queues	PCU - Hrs	512.1	599.4	539.6	619.4	27.5	20.1
Over-capacity Queues	PCU - Hrs	23.5	39.4	78.4	59.4	55.0	20.0
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1256.8	1342.3	19.2	13.0
Total Travel Time	PCU - Hrs	1773.1	1968.1	1874.8	2021.2	101.7	53.1
Total Travel Distance	PCU - kms	71087.6	75434.8	71769.5	75812.1	681.9	377.3
Average Speed	kph	40.1	38.3	38.3	37.5	-1.8	-0.8

Table 5-6: Scenario 6 Network Summary Statistics

5.7.11. Table 5-6 shows that Scenario 6 leads to increases in queueing, travel time and travel distance and a reduction in average speed.

SCENARIO 6 SUMMARY

5.7.12. In Scenario 6 traffic is seen to reassign away from gyratory area to King Street, Loke Road and Tennyson Avenue. There is significant increase in delay at the Gaywood Road / Loke Road junction. This delay increase could be addressed through signal optimisation or junction reconfiguration to account for the change in flow patterns. Strategic reassignment is also observed in northbound traffic (100 + vehicles) in both time periods shifting from Edward Benefer Way to Wootton Road.

5.8 GYRATORY RAILWAY ROAD TWO WAY (SCENARIO 7)

5.8.1. Scenario 7 causes reassignment away from the gyratory although not as much as in Scenario 6. Figure 5-19 shows the flow difference plot between Scenario 7 and the Do Minimum in 2026 for AM Peak.



Figure 5-19: Scenario 7 – DM Actual Flow Difference Plot AM Peak

- 5.8.2. There is noticeable reduction in flow has been observed on Railway Road (up to 397 PCUs), and consequently traffic on B1144 and King Street has increased. There is a reduction of up to 95 PCUs along Edward Benefer Way with a counter increase of up to 72 PCUs on the A148.
- 5.8.3. There are some modest delay changes (positive and negative) around the gyratory. The John Kennedy Road approach to the Austin Street junction sees an increase of 11 seconds, whilst Blackfriars Road Southbound sees an increase of 24 seconds. Wellesley Street is seen to have experience a delay of 58 seconds. The largest increase of 80 seconds is seen as Purfleet Place

eastbound.Figure C.7-53 shows the delay difference between Scenario 7 and the Do Minimum in 2026 for AM Peak.

- 5.8.4. Within this town centre area there are two links which are at or near capacity. These are the junction of Railway Road with Blackfriars Road and the junction of Purfleet Place with King Street. Figure C.7-54 illustrates these Volume/ Capacity ratios as a percentage for Scenario 7 in 2026 for AM Peak.
- 5.8.5. Figure 5-20 shows the flow difference plot between Scenario 7 and the Do Minimum in 2026 for PM Peak.



Figure 5-20: Scenario 7 – DM Actual Flow Difference Plot PM Peak

- 5.8.6. A significant reduction in flow, up to 327, is observed on Railway Road, and a reduction of up to 343 on Blackfriars Road, which leads to an increase in traffic on the B1144 and King Street. The western end of Gaywood Road / Littleport Street also sees a reduction to/from the east. Portland Street sees an increase of 302 vehicles as a consequence of the changes in the configuration of the gyratory.
- 5.8.7. There are a number of links around the gyratory each with increases of approximately 20 seconds, which combined adds considerably to the overall travel time around the gyratory. There is also an increase of 23 seconds on Gaywood Road east of Tennyson Avenue. These delays are illustrated in Figure C.7-56 which shows the delay differences between Scenario 7 and the Do Minimum in 2026 for PM Peak.
- 5.8.8. There are a few links which are at or near capacity, namely some links at the junction of Railway Road with Blackfriars Road, the junction of Southgates roundabout and the junction of Loke Road with Gaywood Road. Figure C.7-57 shows the Volume/ Capacity ratio as a percentage for Scenario 7 in 2026 for PM Peak.

SCENARIO 7 NETWORK SUMMARY STATISTICS

5.8.9. Table 5-7 presents network summary statistics for Scenario 7 and a comparison against the Do Minimum case.

		DM		Scenario 7		Scenario 7 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	PM
Transient Queues	PCU - Hrs	512.1	599.4	519.5	619.7	7.5	20.3
Over-capacity Queues	PCU - Hrs	23.5	39.4	45.1	39.0	21.7	-0.4
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1244.7	1333.0	7.2	3.7
Total Travel Time	PCU - Hrs	1773.1	1968.1	1809.4	1991.7	36.3	23.5
Total Travel Distance	PCU - kms	71087.6	75434.8	71309.5	75587.2	221.9	152.4
Average Speed	kph	40.1	38.3	39.4	38.0	-0.7	-0.4

Table 5-7: Scenario 7 Network Summary Statistics

5.8.10. Table 5-7 shows that Scenario 7 increases queuing, travel times, and travel distances, with a small reduction in average speeds.

SCENARIO 7 SUMMARY

5.8.11. In common with Scenario 6, there is significant reassignment away from the gyratory to parallel routes: King Street, Tennyson Avenue. There is also reassignment from Edward Benefer Way to Wootton Road. Loke Road is predicted an increase in traffic which may not be desirable given its residential nature.

5.9 RAILWAY ROAD (SCENARIO 8)

5.9.1. Scenario 8, in common with the other scenarios primarily affects the assignment of traffic within the town centre. In contrast, however, the reassignment impacts do not spread as far out as some of the other scenarios. Figure 5-21 shows the flow difference plot between Scenario 8 and the Do Minimum in 2026 for AM Peak.



Figure 5-21: Scenario 8 – DM Actual Flow Difference Plot AM Peak

- 5.9.2. There is noticeable reduction in flow has been observed on Railway road, in turn traffic on B1144 road and King street got increased. A noticeable reduction in flow has been observed on Railway Road and Edward Benefer Way, in turn traffic on B1144 road and Reid Way has increased.
- 5.9.3. Most of the town centre sees no or only small impacts on delay. There is a significant increase in delay of 81 seconds on the Saint James' Road approach to the Blackfriars Road / Railway Road. An increase of 56 seconds is seen on A148 Wellesley Street, whilst a 60 second increase is seen on Purfleet Place. These are illustrated in Figure C.8-60 which shows the delay difference between Scenario 8 and the Do Minimum in 2026 for AM Peak.

- 5.9.4. There are a few links which are at or near capacity, namely at the junction of Railway Road with Blackfriars Road and at the junction of Purfleet Place with King Street and are consistent with the locations of the largest increases in delay. These are illustrated Figure C.8-61 which shows the Volume/ Capacity ratio as a percentage for Scenario 8 in 2026 for AM Peak.
- 5.9.5. Figure 5-22 shows the flow difference plot between Scenario 8 and the Do Minimum in 2026 for the PM Peak.



Figure 5-22: Scenario 8 – DM Actual Flow Difference Plot PM Peak

- 5.9.6. There is noticeable reduction in flow on Railway Road and Gaywood Road, with traffic diverted towards the B1144, Tennyson Avenue.
- 5.9.7. Most links in the network see no change in delay. However, there is noticeable increase in delay of 30 seconds on the John Kennedy Road approach to the John Kennedy Road / Austin Street junction. A 58 second increase in delay is seen on the A148 Wellesley Road, and a 48 second increase on the Blackfriars Road approach to Blackfriars Road / Railway Road junction. Figure C.8-64 illustrates these delay differences between Scenario 8 and the Do Minimum in 2026 for PM Peak.

5.9.8. There are few links which are at or over capacity namely, such as at the junction of Railway Road with Blackfriars Road, Southgates roundabout, at the junction of Saturday Market Place with Church Street and the junction of Loke Road with Gaywood Road. Figure C.8-65 illustrates these Volume/ Capacity ratios as a percentage for Scenario 8 in 2026 for PM Peak.

SCENARIO 8 NETWORK SUMMARY STATISTICS

5.9.9. Table 5-8 presents network summary statistics for Scenario 8 and a comparison against the Do Minimum case.

		DM		Scenario 8		Scenario 8 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	РМ
Transient Queues	PCU - Hrs	512.1	599.4	514.1	627.6	2.0	28.2
Over-capacity Queues	PCU - Hrs	23.5	39.4	40.8	36.6	17.3	-2.8
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1244.7	1333.4	7.1	4.1
Total Travel Time	PCU - Hrs	1773.1	1968.1	1799.5	1997.6	26.5	29.5
Total Travel Distance	PCU - kms	71087.6	75434.8	71170.3	75606.6	82.7	171.8
Average Speed	kph	40.1	38.3	39.5	37.8	-0.5	-0.5

Table 5-8: Scenario 8 Network Summary Statistics

5.9.10. Table 5-8, like Scenarios 6 and 7, shows that there is an increase in queuing, travel times and travel distance with a reduction in speed in Scenario 8.

SCENARIO 8 SUMMARY

5.9.11. Scenario 8 illustrates a reduction in traffic around the gyratory. In the AM there is a shift in traffic from Edward Benefer Way to Lynnsport Way northbound and residentials roads such as Columbia Way. As seen in other Scenarios where traffic is discouraged from using the gyratory, there is an increase in traffic on South Quay and King Street. Overall, there is no noticeable benefit to network performance.

5.10 SOUTHGATES (SCENARIO 9)

5.10.1. Figure 5-23 shows the flow difference plot between Scenario 9 and the Do Minimum in 2026 for AM Peak.



Figure 5-23: Scenario 9 – DM Actual Flow Difference Plot AM Peak

- 5.10.2. There are minimal changes in forecast across King's Lynn Town Centre. The consequent delay changes are minimal given small flow change and are illustrated in Figure C.9-67.
- 5.10.3. There are a couple of links at or over capacity, such as on London Road, although most links operate well within capacity. Figure C.9-68 illustrates the Volume/ Capacity ratios as a percentage for Scenario 9 in 2026 for AM Peak.

5.10.4. Figure 5-24 shows the flow difference plot between Scenario 9 and the Do Minimum in 2026 for PM Peak.



Figure 5-24: Scenario 9 – DM Actual Flow Difference Plot PM Peak

- 5.10.5. As with the AM there is no noticeable flow change as a consequence of the Southgates scheme.
- 5.10.6. The scheme has very little impact on delay within King's Lynn town centre. Figure C.9-70 shows the delay difference between Scenario 9 and the Do Minimum in 2026 for PM Peak.
- 5.10.7. Most roads within network are within capacity, with volume capacity ratios below 85%. However, there is a high V/C ratio at the entry approach of Southgate roundabout and at the junction of Loke road with Gaywood Road. This is illustrated in Figure C.9-71 which shows the Volume/ Capacity ratio for Scenario 9 in 2026 for PM Peak.

SCENARIO 9 NETWORK SUMMARY STATISTICS

5.10.8. Table 5-9 presents network summary statistics for Scenario 9 and a comparison against the Do Minimum case.

		DM		Scenario 8		Scenario 8 - DM	
Statistic	Unit	AM	РМ	AM	РМ	AM	РМ
Transient Queues	PCU - Hrs	512.1	599.4	510.4	598.2	-1.6	-1.2
Over-capacity Queues	PCU - Hrs	23.5	39.4	23.5	40.9	0.0	1.6
Link Cruise Time	PCU - Hrs	1237.6	1329.3	1237.7	1329.0	0.2	-0.3
Total Travel Time	PCU - Hrs	1773.1	1968.1	1771.6	1968.1	-1.4	0.0
Total Travel Distance	PCU - kms	71087.6	75434.8	71094.4	75422.9	6.8	-11.9
Average Speed	kph	40.1	38.3	40.1	38.3	0.0	0.0

Table 5-9: Scenario 9 Network Summary Statistics

5.10.9. Scenario 9 shows a marginal improvement in transient queuing, with little change in travel time and distance, and no change in average speed.

SCENARIO 9 SUMMARY

5.10.10. Scenario 9 has minimal impact on flow levels and delays in both time periods.