Nantwich West Traffic Study

December 2017
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1 Introduction

1.1 Overview

Nantwich has been identified as a key service centre for Cheshire East in the Local Plan. Future development traffic combined with background traffic growth and traffic associated with committed development is likely to have an impact on the highway network, particularly in the west of Nantwich. Jacobs has been appointed by Cheshire East Council to review proposals for improvements to the local highway network and to make recommendations as to a preferred scheme as well as the next steps required to implement such a scheme.

1.2 Planning Background

Existing residential developments are located at Taylor Drive and Edmund Wright Way, which were constructed by different housebuilders. It is understood from discussions with officers at CEC that the two roads were intended to be connected as a through-route upon completion of residential development. Following difficulties in agreeing the timing and responsibility for connecting the two roads, it was agreed with the developers that Cheshire East Council would adopt the link as public highway and would receive a commuted sum for initially adopting the link as a pedestrian route only, and would seek to implement a vehicular link at some point in the future.

A planning application by Gladman Developments Ltd (‘Gladman’) for up to 270 houses at Queens Drive was refused by Cheshire East Council partially on highways grounds in 2012. During a subsequent Public Inquiry (ref. APP/R0660/A/12/2187264), it was agreed between the developer and the council that the implementation of the Taylor Drive/Edmund Wright Way link would in part mitigate the impacts of traffic associated with the development. As such, a sum of money was secured from Gladman by way of Planning Obligation towards the implementation of the link.

Subsequent to the above Public Inquiry, Gladman submitted a second-phase application in 2014 for a further 118 dwellings on land adjacent to the Queens Drive site (herein referred to as ‘the Phase 2 development’, and since construction known as ‘Malbank Waters’).

The Transport Assessment (‘TA’) submitted by Gladman to accompany the Phase 2 development accounted for the implementation of the aforementioned Taylor Drive/Edmund Wright Way link; alongside traffic management measures comprising one-way southbound operation on Marsh Lane and two alternatives for one-way operation on Welsh Row. It was concluded within the CEC Highways Development Control consultation response that the above measures would be required in order to mitigate the impact of the Phase 2 development.

The measures were described within the Phase 2 TA in outline only, with no final recommendation as to in which direction Welsh Row would operate; no consideration of supporting traffic management measures; and no consideration on the impact of the measures on bus operation. Consequently, Cheshire East Council has requested Jacobs to undertake a review of Phase 2 TA in order to (1) establish the validity of the TA’s outline recommendations and (2) provide a more detailed consideration of supporting traffic management measures.
From the review, further consideration can be applied to the recommended proposals to identify a ‘preferred’ option of what is most suitable package of measures. The ‘preferred’ option would then be taken forward for public engagement before the adoption of a final scheme.

1.3 Outline of Report Chapters

The remainder of this report is set out as follows:

- **Section 2** comprises a review of the Queens Drive Phase 2 TA, in order to check the validity of the traffic analysis undertaken underpinning the rationale for potential network changes.

- **Section 3** considers the impacts of the potential measures on the bus network, and as such identifies the existing routes serving the west of Nantwich and identifies any implications of potential network changes on bus services.

- **Section 3** considers traffic management and as such comprises a review of existing new parking restrictions and traffic calming, and new traffic management measures which may be beneficial.

- **Section 4** provides a summary of the report and concludes with recommendations as to a preferred scheme and the recommended next steps for its implementation.
2.1 Overview

The TA submitted by Gladman to support the Phase 2 planning application included capacity assessments at five off-site junctions.

The TA also accounted for the following potential highway improvements:

- A connection between Taylor Drive and Edmund Wright Way, as described in Section 1. This would provide an additional route for vehicles to travel between Taylor Drive, Edmund Wright Way and Marsh Lane, thereby reducing the number of vehicles travelling to Marsh Lane via Queens Drive and Marsh Lane;

- A restriction of Marsh Lane between Welsh Row and Edmund Wright Way to one way southbound. This is intended to reduce the conflict for space at the junction of Queens Drive and thereby minimise road safety and vehicle delay impacts; and

- To operate a one-way direction of travel on Welsh Row in either an eastbound or westbound direction. This will minimise conflict at junctions and create a smoother traffic flow.

As such, the Phase 2 TA made assumptions as to the redistribution of traffic within capacity assessments on the highway network.

This section of the report reviews the work undertaken as part of the TA for the Phase 2 criteria. As such, this section considers the following elements:

- The methodology applied in deriving traffic data in respect of survey data sources, assessment years and development trip rates;

- The methodology undertaken in reassigning traffic flows following the highway improvements; and

- The results of the junction capacity modelling undertaken.

Based on the above review, the section concludes with the appropriateness of the work undertaken within the Phase 2 TA for developing a preferred scheme.

2.2 Traffic Data

2.2.1 Survey Data and Assessment Years

Survey data for the Phase 2 TA was based upon survey data collected for the Queens Drive Phase 1 TA, which was collected in November 2011, therefore being three years old at the time of the TA, and six years old as of the present study.

To account for potential traffic growth on the highway network between the data’s collection in 2011 and the 2014 ‘base’ year of the TA, the Phase 2 consultant has applied growth factors derived from TEMPRO software, using the NTEM 6.2 dataset modified by NTM AF09 for cars and light vehicles, and the NTM 2010 dataset for
heavy vehicles. This is the standard methodology for estimating growth in passenger car traffic. The growth rates from the Phase 2 TA are shown below.

<table>
<thead>
<tr>
<th>Base Year</th>
<th>Forecast Year</th>
<th>Cars and LGVs AM Peak</th>
<th>Cars and LGVs PM Peak</th>
<th>HGVs both peaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2014</td>
<td>1.014</td>
<td>1.015</td>
<td>1.009</td>
</tr>
</tbody>
</table>

*Table 2-1 Background Traffic Growth Factors from TA*

For comparison, growth rates have been derived by Jacobs using the same methodology, based upon the most recently available datasets, derived from NTEM 7.2. These are shown below.

<table>
<thead>
<tr>
<th>Base Year</th>
<th>Forecast Year</th>
<th>Cars and LGVs AM Peak</th>
<th>Cars and LGVs PM Peak</th>
<th>HGVs both peaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2014</td>
<td>1.007</td>
<td>1.008</td>
<td>0.9940</td>
</tr>
</tbody>
</table>

*Table 2-2 Background Traffic Growth Factors from TEMPRO 7.2*

It can be seen from comparing the two tables above that the growth rates applied within the Phase 2 TA are higher than those derived by Jacobs using more recently-published datasets. As such, the 2011 to 2014 growth estimates can be considered to be robust.

The applicant has also applied a further growth rate to account for traffic growth between the ‘base’ year of the TA and a future year five years after the planning application, i.e. 2019. This is standard practice in the assessment of the local highway network.

The growth rates for 2014 to 2019 applied within the TA are shown below.

<table>
<thead>
<tr>
<th>Base Year</th>
<th>Forecast Year</th>
<th>Cars and LGVs AM Peak</th>
<th>Cars and LGVs PM Peak</th>
<th>HGVs both peaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2019</td>
<td>1.073</td>
<td>1.075</td>
<td>1.037</td>
</tr>
</tbody>
</table>

*Table 2-3 Background Traffic Growth Factors from TA*

For comparison, growth rates have again been derived by Jacobs using the same methodology, based upon the most recently available datasets, derived from NTEM 7.2. These are shown below.

<table>
<thead>
<tr>
<th>Base Year</th>
<th>Forecast Year</th>
<th>Cars and LGVs AM Peak</th>
<th>Cars and LGVs PM Peak</th>
<th>HGVs both peaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2019</td>
<td>1.0065</td>
<td>1.0084</td>
<td>1.033</td>
</tr>
</tbody>
</table>

*Table 2-4 Background Traffic Growth Factors from TEMPRO 7.2*
It can be seen from comparing the two tables above that the growth rates applied within the Phase 2 TA are higher than those derived by Jacobs using more recently-published datasets. As such, the 2014 to 2019 growth estimates can be considered to be robust.

The differences in growth rates can be accounted for by differences in datasets, with the more recently-available data accounting for lower growth assumptions than the older dataset.

Given that the likely implementation of the traffic management measures that are the subject of the present study would be 2018-19, the 2019 assessment year from the Phase 2 TA is considered to be appropriate to allow CEC to understand the immediate impacts of the scheme. Although the survey data dates from 2011, it can be seen from the above comparative analysis that the rates applied within the TA are robust.

Furthermore, it should be noted that no manual adjustment of growth rates appears to have been made to avoid ‘double counting’ traffic growth associated with the committed developments that have been manually included within the assessment data. As such, it is possible that the estimated 2019 traffic flows from the Phase 2 TA indeed overestimate volumes on the local highway network, making any assessments based on these further robust.

2.2.2 Committed Developments

A detailed review of the Phase 2 TA shows the following committed developments were included in their analysis:

- Queens Drive (Phase 1) – 270 dwellings;
- COG Training and Conference Centre, Crewe Road – 59 dwellings;
- Kingsley Fields (also known as the North West Nantwich Urban Extension) – 1100 dwellings;
- Stapeley Water Gardens (Phase 1) – 146 dwellings;
- Stapeley Water Gardens (Phase 2) – 171 dwellings; and
- Audlem Road/Broad Road – 189 dwellings.

It is noted that the flows associated with the Kingsley Fields development include for a new link road between the Reaseheath Roundabout and the junction of Wettenhall Road/Welshmens Lane/A51. This improvement is anticipated to provide additional capacity in the north-western part of Nantwich.

From the TA provided by RPS Group, it is evident that the new link road associated with the Kingsley Fields site is predicted to be utilised by existing traffic which currently passes through the town centre. This is likely to reduce the existing congestion found at junctions. The TA includes an ANPR study of an AM peak period and PM peak period and the corresponding reduction in vehicles was taken from the overall calculations. The overall projected growth therefore accounts for the increased highway capacity which the new link road will provide.
It is understood that the above represents a robust estimate of committed developments between the time of the Phase 2 TA and the 2019 assessment year. Indeed, it is further understood that it is unlikely that the full quantum of the above developments is unlikely to be fully built-out by 2019. This combined with an absence of manual reduction in ‘background’ traffic growth rates as described above means that overall estimates of future traffic flows, and associated future year capacity assessments undertaken using the data could be considered to be a ‘worst case’ assessment.

### Table 2-5 Trip Rates Utilised in Kingsley Field TA

<table>
<thead>
<tr>
<th>Peak</th>
<th>Arrivals</th>
<th>Departures</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak</td>
<td>0.140</td>
<td>0.426</td>
<td>0.566</td>
</tr>
<tr>
<td>PM Peak</td>
<td>0.392</td>
<td>0.219</td>
<td>0.611</td>
</tr>
</tbody>
</table>

For comparison, the difference in trip rates applied in the Queens Drive TAs and the Kingsley Field TA are shown in the table below.

### Table 2-6 Difference in Trip Rates Applied Between Queens Drive and Kinsley Field TAs

<table>
<thead>
<tr>
<th>Peak</th>
<th>Arrivals</th>
<th>Departures</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak</td>
<td>+0.103 (+74%)</td>
<td>+0.065 (+15%)</td>
<td>+0.168 (+30%)</td>
</tr>
<tr>
<td>PM Peak</td>
<td>+0.103 (+26%)</td>
<td>+0.136 (+62%)</td>
<td>+0.239 (+39%)</td>
</tr>
</tbody>
</table>

The differences are due to differing land use criteria selected, reflecting the differing combined with different versions of the database due to the TAs having been produced at different times.

Comparing the Queens Drive two-way trip rates to those used in the Kingsley Field TA, the Queens Drive trip rates are at least 30% higher. As such, the traffic estimated to be generated by the Queens Drive Phase 1 and Phase 2 developments can be considered to be robust.

### 2.3 Traffic Reassignment

The Phase 2 TA includes for the reassignment of traffic around the local highway network as a result of the measures outlined in Section 2.1. This has been calculated in a staged approach, with changes associated with the Taylor Drive/Edmund Wright Way link calculated initially, followed by considering one-way schemes at Marsh Lane and Welsh Row. The methodology is considered in detail below.

#### 2.3.1 Edmund Wright Way/Taylor Drive Link

The Phase 2 TA gives the following rationale for the link:

‘The purpose of the upgrading of the Edmund Wright Way/Taylor Drive link is to provide an alternative route for traffic wishing to gain access to Welsh Row from Queens Drive and reduce traffic travelling through the conservation area.’

In the Phase 2 TA, AM and PM base traffic flows from Figures 3 and 4 of the Phase 2 TA have been re-assigned through the local highway network with the Edmund
Wright Way and Taylor Drive link included, but without the inclusion of one-way schemes at Marsh Lane and/or Welsh Row. Figures 5 and 6 of the Phase 2 TA illustrate how background traffic has been redistributed with the Edmund Wright Way and Taylor Drive link included and identifies the number of vehicles reassigning to the new link.

The Phase 2 TA explains that:

‘All traffic turning left from Marsh Lane to Welsh Row and right from Welsh Row to Marsh Lane has been transferred onto the Edmund Wright Way and Taylor Drive link. Traffic turning left from Queens Drive onto Welsh Row and right from Welsh Row to Queens Drive has then been split between the Queens Drive and Marsh Lane based on existing turning proportions at both junctions’.

A comparison of Figures 3 and 4 with Figures 5 and 6 indicates that the above explanation is factually incorrect. Based on a review of the vehicle numbers within the diagrams and annotations within the diagrams (‘50%’, ‘25%’, ‘25%’), the redistribution exercise appears to have instead applied the following principles:

- 50% of traffic to/from the west that currently turns from/to Welsh Row at Marsh Lane and Queens Drive would utilise the Taylor Drive/Edmund Wright Way link, i.e. utilise the junction of Waterlode/Chester Road/Taylor Drive/Welsh Row;

- The remaining traffic making these movements would turn equally at Welsh Row/Marsh Lane (25%) and Welsh Row/Queens Drive (25%), reflecting the approximately equal proportions of such movements from/to the west at the two junctions; and

- For movements to/from the east, there would be no change in movements.

Figures 7 and 8 of the Phase 2 TA illustrate the resulting AM and PM peak 2019 redistributed traffic flows following the completion of the Edmund Wright Way and Taylor Drive link, i.e. by combining the flows in Figures 3 and 5 and Figures 4 and 6 for the AM/PM peak periods respectively.

It is considered that the above assumptions are reasonable, given the following:

- Traffic turning right into/left from Marsh Lane or Queens Drive at their junctions with Welsh Row would have travelled from the west, i.e. past the junction of Waterlode/Chester Road/Taylor Drive/Welsh Row, meaning that this would be the first available route to/from areas to the south of Welsh Row; and

- Notwithstanding the above, assignment via Marsh Lane and/or Queens Drive would still provide a more direct route for properties served directly from these roads. In the absence of detailed assignment data such as Road Side Interview survey results or microsimulation modelling, it is reasonable to assume that 50% of vehicles would continue to utilise Marsh Lane or Queens Drive.

Figures 9 and 10 apply the growth rates described in Section 2.2.2 to the 2014 flows to derive 2019 network flows, while Figures 11 and 12 include committed developments as described in Section 2.2.3. This is in accordance with standard practice in Transport Planning.
2.3.2 Marsh Lane and Welsh Row One-Way Operation

The Phase 2 TA gives the following rationale for introducing one-way operation on Marsh Lane and Welsh Row:

‘It was agreed during scoping discussions with Highways Officers at CEC that a traffic management approach would be adopted as part of the proposed development scheme.

This traffic management approach represents a move away from the standard ‘predict and provide’ approach which is more common for identifying measures to mitigate the traffic impact of new developments on the local highway network.

In addition, it is considered that a managed approach would have significant benefits, not only for future residents of the proposed development but existing residents and visitors to Nantwich.’

The Phase 2 TA also notes that making Marsh Lane one-way would ‘further improve pedestrian safety’ close to Millfields Primary School.

The TA presents two different options for traffic management, as set out below.

Option 1:

- The restriction of Marsh Lane between Welsh Row and Edmund Wright Way to one way southbound; and
- The restriction of Welsh Row between Queens Drive and Waterlode to one way eastbound.

Option 2:

- The restriction of Marsh Lane between Welsh Row and Edmund Wright Way to one way southbound; and
- The restriction of Welsh Row between Queens Drive and Waterlode to one way westbound.

In the assignment of traffic around the revised highway network, the Phase 2 TA states the following:

‘Distribution models have been produced based on origin and destination patterns in and out of the network and tested to assess the impact of the resulting distributions on a number of junctions. For both options, base data has demonstrated that a proportion of traffic entering the network has the local network tested as their final destination. This traffic has been dispersed internally within the network for each option tested.’

Beyond the above, the Phase 2 TA does not provide any further explanation as to the methodology applied in reassigning traffic.

For Option 1, the 2019 Base flows for the AM and PM peak can be found in Figures 13 and 14 of the Phase 2 TA, while for Option 2, the 2019 Base flows for the AM and PM peak can be found in Figures 15 and 16 of the Phase 2 TA.
Notwithstanding an absence of detail within the Phase 2 TA, based on a review of differences in traffic flows between the 2019 'Base' flows in Figures 11 and 12 with the flows in Figures 13 to 16, the redistribution exercise appears to have instead applied the following principles:

**In Option 1 (i.e. Welsh Row eastbound)**

- Traffic that would previously have turned left onto Welsh Row from Marsh Lane would instead route via Taylor Drive;
- Traffic that would previously have turned right onto Welsh Row from Marsh Lane would instead route via Queens Drive;
- Traffic that would previously have turned left from Waterlode (S) onto Welsh Row would instead go straight ahead onto Waterlode (N);
- Traffic that would previously have gone straight-ahead from High Street to Marsh Lane would instead turn right onto Waterlode (N);
- Flows at the Waterlode arm of the Waterlode/Chester Road/Welsh Row junction would increase, accounting for traffic re-routing onto Waterlode at the Waterlode/High Street/Welsh Row junction, with increases in flows turning right onto Chester Road and ahead onto Taylor Drive. Accordingly, flows approaching the junction on the Welsh Row arm would decrease.

**In Option 2 (i.e. Welsh Row westbound)**

- Traffic that would previously have turned left onto Welsh Row from Marsh Lane would instead route via Taylor Drive;
- Traffic that would previously have turned right onto Welsh Row from Marsh Lane would instead route via Taylor Drive;
- Traffic that would previously have entered the junction of Waterlode/High Street/Welsh Row from Welsh Row would instead route via Waterlode at the Waterlode/Chester Road/Taylor Drive/Welsh Row junction, with a resulting increase in flows entering the Waterlode/High Street/Welsh Row junction from the Waterlode (N) arm;
- Flows at the Taylor Drive arm of the Waterlode/Chester Road/Taylor Drive/Welsh Row would increase, primarily towards Waterload but also towards Chester Road, accounting for traffic re-routing from Queens Drive to access Nantwich town centre.

The above re-routing assumptions appear to be logical and provide a reasonable basis for undertaking capacity modelling, based on the two different options at Welsh Row.

### 2.4 Capacity Modelling

The scope of the Phase 2 TA included capacity assessments at the following off-site junctions on the local highway network:

- A534 Waterlode / A534 Chester Road / Taylor Drive / Welsh Row signalised junction;
• Marsh Lane / Welsh Row priority junction;
• Queens Drive / Welsh Row priority junction;
• Waterlode / High Street / Welsh Row signalised junction; and
• Marsh Lane / Queens Drive priority junction.

The above scope was agreed with CEC Highways prior to the submission of the TA, and was in turn based on the scope the Queens Drive Phase 1.

The models were produced based on the ‘Base’ 2019 scenario described previously (i.e. excluding any amendments to the highway network and also excluding traffic associated with the Queens Drive Phase 2 development, but including committed development traffic and additional ‘background’ traffic growth) and the Option 1 and Option 2 amendments to the network (which both also include A534 Waterlode / A534 Chester Road / Taylor Drive / Welsh Row).

The capacity results for the 2019 scenarios are considered in turn below. These were undertaken in PICADY software for priority junctions and LinSig software for signalised junctions, with the following explanatory notes:

• PICADY results refer to the Ratio of Flow to Capacity (RFC) and queue length predicted on each arm of the junction. An RFC of 1.00 indicates that the arm in question is operating at its theoretical capacity, whilst an RFC of 0.85 or less indicates that the arm is operating within its practical capacity.

• LinSig results refer to the Degree of Saturation (DoS) and Mean Maximum Queue (MMQ) predicted in each lane of the junction. A DoS of 100% indicates that the lane in question is operating at its theoretical capacity (point of saturation), whilst a DoS of 90% or less indicates that the lane is operating within its practical capacity.

2.4.1 A534 Waterlode / A534 Chester Road / Taylor Drive / Welsh Row

The 2019 Base results indicate that the junction would operate within theoretical and practical capacity without any changes to the highway network, with a maximum DoS value of 65.7%.

The 2019 Option 1 results indicate that, with the Taylor Drive link, Marsh Lane one-way, and Welsh Row eastbound measures in place, plus Queens Drive Phase 2 traffic, the maximum DoS value would increase to 74.7%, i.e. still within theoretical and practical capacity.

The 2019 Option 2 results indicate that, with the Taylor Drive link, Marsh Lane one-way, and Welsh Row westbound measures in place, plus Queens Drive Phase 2 traffic, the maximum DoS value would increase to 90.2%, i.e. still within theoretical capacity and at the threshold of practical capacity.

Based on the capacity results above, Option 1 would be beneficial considering impacts at the A534 Waterlode / A534 Chester Road / Taylor Drive / Welsh Row junction.
2.4.2 Marsh Lane / Welsh Row

The 2019 Base results indicate that the junction would operate within theoretical and practical capacity without any changes to the highway network, with a maximum RFC value of 0.026.

The 2019 Option 1 results indicate that, with the Taylor Drive link, Marsh Lane one-way, and Welsh Row eastbound measures in place, plus Queens Drive Phase 2 traffic, the maximum RFC value on Marsh Lane would increase to 0.083, i.e. still within theoretical and practical capacity. Marsh Lane would have no RFC value, as this arm would become an exit only.

The 2019 Option 2 results indicate that, with the Taylor Drive link, Marsh Lane one-way, and Welsh Row westbound measures in place, plus Queens Drive Phase 2 traffic, the maximum RFC value on Marsh Lane would increase to 0.026, i.e. still within theoretical capacity and at the threshold of practical capacity. Marsh Lane would have no RFC value, as this arm would become an exit only.

Based on the capacity results above, Option 1 would be beneficial considering impacts at the Marsh Lane / Welsh Row priority junction, although in either Option 1 or Option 2, impacts on Welsh Row would be negligible from a capacity perspective.

2.4.3 Queens Drive / Welsh Row

The 2019 Base results indicate that the junction would operate at the theoretical capacity threshold, and above the practical capacity threshold, without any changes to the highway network, with a maximum RFC value of 1.001.

The 2019 Option 1 results indicate that, with the Taylor Drive link, Marsh Lane one-way, and Welsh Row eastbound measures in place, plus Queens Drive Phase 2 traffic, the maximum RFC value would increase to 1.085, i.e. still above theoretical and practical capacity than the Base scenario.

The 2019 Option 2 results indicate that, with the Taylor Drive link, Marsh Lane one-way, and Welsh Row westbound measures in place, plus Queens Drive Phase 2 traffic, the maximum RFC value would decrease to 0.042 i.e. significantly within theoretical capacity and at the threshold of practical capacity.

Based on the capacity results above, Option 2 would be beneficial considering impacts at the Queens Drive/Welsh Row junction.

2.4.4 A534 Waterlode / High Street / Welsh Row

The 2019 Base results indicate that the junction would operate above both the theoretical and practical capacity thresholds without any changes to the highway network, with a maximum DoS value of 102.6%, i.e. above theoretical and practical capacity.

The 2019 Option 1 results indicate that, with the Taylor Drive one-way link, Marsh Lane one-way, and Welsh Row eastbound measures in place, plus Queens Drive Phase 2 traffic, the maximum DoS value would increase to 83.3%, i.e. this would bring the junction’s operation to within theoretical and practical capacity.

The 2019 Option 2 results indicate that, with the Taylor Drive link, Marsh Lane one-way, and Welsh Row westbound measures in place, plus Queens Drive Phase 2 traffic, the maximum DoS value would decrease to 0.042 i.e. significantly within theoretical capacity and at the threshold of practical capacity.
traffic, the maximum DoS value would increase to 101.8%, i.e. marginally improved compared to the Base operation, but still above the theoretical and practical capacity thresholds.

Based on the capacity results above, Option 1 would be beneficial considering impacts at the A534 Waterlode / High Street / Welsh Row junction.

The recent installation of MOVA control at this junction is not accounted for within the modelling results in the Phase 2 TA, as it is not possible to fully replicate the benefits of this type of phasing control within the LinSig software used. It should be noted that, based on-site observations, this measure appears to have reduced delay compared to the time when the surveys were undertaken. In light of this, the future-year modelling outputs within the TA can be considered as robust and a worst-case scenario.

**2.4.5 Marsh Lane/Queens Drive**

It is noted that, although the assessment of the junction of Marsh Lane/Queens Drive was agreed during the scoping exercise, a capacity assessment does not appear to have been undertaken as part of the Phase 2 TA.

Notwithstanding the above, the junction was assessed by the same transport consultant as part of the Queens Drive Phase 1 TA. The 2012 Base plus development modelling results within that TA indicated a maximum RFC value of 0.053, i.e. significantly below theoretical and practical capacity. While the 2019 scenario would include higher volumes, given the capacity available, it is considered the impacts of either Option 1 or Option 2 at this junction would be negligible.

**2.4.6 Edmund Wright Way/Marsh Lane/Millfields**

The above junction was not included within the scope of assessment of the Phase 2 TA, and it is understood that from discussions with officers at CEC Highways the junction is currently lightly trafficked and there are no existing capacity concerns from CEC Highways associated with the junction’s operation.

Notwithstanding this, it is noted that the junction would be estimated to experience an increase in flows commensurate with the additional vehicles utilising the new Edmund Wright Way-Taylor Drive link. Based on a review of the traffic diagrams within the Phase 2 TA, the majority of these movements would be to/from roads to the south-east of the junction, i.e. Millfields, Queens Drive and the culs-de-sac served from these.

The junction is currently priority-controlled, with the northern and southern arms (Marsh Lane) having priority. With either Option 1 or Option 2 implemented, the predominant flow at the junction would become between Edmund Wright Way and Millfields. Given this, the reconfigured junction may benefit from rearrangement such that west-east movements would be the priority movements. The capacity of the junction and preferred arrangement could be confirmed by undertaking capacity assessments prior to its implementation in order to fully understand the impacts of the Edmund Wright Way/Taylor Drive link.
2.5 Conclusions of Phase 2 TA Review

The CEC Highways Development Control consultation response for the Phase 2 development included the following conclusions with regard to the surrounding road network:

- In the ‘Do Minimum’ scenario with no change to the road network, the Waterlode signal junction will be operating over capacity as would the Queens Drive/Welsh Row junction;
- There is a benefit in respect of capacity in introducing a one-way system on Welsh Row;
- It is beneficial to restrict traffic to travelling one way southbound from Welsh Row to Edmund Wright Way;
- In order to accommodate for the large amount of committed development in Nantwich, there needs to be traffic management changes that reduce the traffic flows on Welsh Row and improves the operation of the signal junction at Waterlode;
- It is preferable if Option 1: Welsh Row one way eastbound between Queens Drive and Waterlode and also Marsh Lane One Way southbound to Edmund Wright Way is implemented, as this would not require a turning head to be provided for vehicles travelling along Welsh Row and having to turn around or use Queens Drive;
- A one-way system on Marsh Lane is preferred since Marsh Lane is narrow and not suited to cater for large volumes of traffic. A one way on this section only works if the Taylor Drive link is implemented;
- There are benefits to the introduction of a one-way system on Welsh Row through reducing traffic in the conservation areas, however the introduction of a one-way system would need to be supported by a Traffic Regulation Order so cannot be conditioned on the original application.

Based on the review of the Phase 2 TA within this section, there is nothing to change the conclusions reached within the original Highways Development Control response. In particular, the following points can be noted:

- Notwithstanding the poor explanation within the report, the methodology associated with redistribution of trips from the Taylor Drive/Edmund Wright Way link appears to be reasonable. Most notably, it is acknowledged that, with the Taylor Drive/Edmund Wright Way link in place, there would likely remain a reasonable proportion of vehicular movements at both the Marsh Lane and Queens Drive junctions without further traffic management measures in place;
- There are existing capacity issues at the Queens Drive/Welsh Row junction;
- Based on a review of the distribution of development traffic, not implementing the Taylor Drive/Edmund Wright Way link would exacerbate capacity issues at the Welsh Row/Waterlode/High Street junction;
- The recent installation of MOVA control has improved delay at the Welsh Row/Waterlode/High Street junction. This is not accounted for within the LinSig results since the software does not cater for MOVA so the modelling results can be considered a worst-case scenario;
• Consideration should be given to amending the priorities of arms at Edmund Wright Way/Marsh Lane/Millfields junction, and undertaking a capacity assessment at this location may be beneficial prior to the implementation of any of the Edmund Wright Way/Taylor Drive link;

• Option 1 (Welsh Row one-way eastbound) would provide improved operational results compared to Option 2 at:
  o A534 Waterlode / A534 Chester Road / Taylor Drive / Welsh Row;
  o Marsh Lane / Welsh Row priority junction; and
  o Waterlode / High Street / Welsh Row.

• The modelling results indicate Option 1 would cause the junction of Queens Drive / Welsh Row to operate further over capacity than either Option 2 or the Base scenario. However, given that in the Base scenario the junction would already operate above capacity, this is not considered to be a significant disbenefit. Furthermore, the assignment exercise undertaken within the Phase 2 TA does not take account of traffic reassigning to alternative routes when experiencing delay, while the Taylor Drive/Edmund Wright Way link would provide such an alternative route, with significant capacity available; and

• It is recommended that a Road Safety Audit (Stage One and Stage Two) is undertaken for the new Taylor Drive vehicular link. This will assess safety, visibility, junction layout and signage/lighting of the proposed link.

In summary, the methodology within the Phase 2 TA appears to be broadly acceptable, and the traffic modelling results would indicate that Option 1 would be preferable in respect of providing additional capacity on the highway network. However, the Phase 2 TA does not provide a consideration of impacts on buses or traffic management implications of the proposals and as such does not identify a preferred option. Therefore, these issues are considered in the subsequent sections of the present study.
3 Impact on Buses

3.1 Introduction

The Phase 2 TA did not give consideration to the impacts of potential network changes on bus services. The following section provides an overview of existing services and the implications of potential network changes on these. The section also provides an assessment as to how implications on bus services should influence the preferred option.

3.2 Existing Routes

The area to the west of Nantwich is served by various bus services, with the majority operating on a daily basis with an hourly frequency. The existing routes serving the residential areas to the west of Nantwich are outlined below.

<table>
<thead>
<tr>
<th>Service</th>
<th>Route</th>
<th>Weekday First Service</th>
<th>Weekday Final Service</th>
<th>Weekday Frequency</th>
<th>Saturday Frequency</th>
<th>Sunday Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>39: Mikro Coaches</td>
<td>Crewe – Shavington – Wybunbury – Nantwich</td>
<td>08:35</td>
<td>17:20</td>
<td>Hourly</td>
<td>Hourly</td>
<td>No service</td>
</tr>
<tr>
<td>51, 52 and 53 D&amp;G</td>
<td>Nantwich Circulars</td>
<td>08:45</td>
<td>16:28</td>
<td>Hourly</td>
<td>Hourly</td>
<td>No service</td>
</tr>
<tr>
<td>56 D&amp;G</td>
<td>Nantwich – Bunbury – Tiverton</td>
<td>10:07</td>
<td>13:03</td>
<td>Thursdays Only. 2 buses per day.</td>
<td>Saturdays Only. 2 buses per day.</td>
<td>No service</td>
</tr>
<tr>
<td>68 D&amp;G</td>
<td>Leighton Hospital – Church Minshull – Worleston – Nantwich</td>
<td>08:35</td>
<td>15:05</td>
<td>4 daily services (Thursdays only except school service which is daily)</td>
<td>4 daily services</td>
<td>No service</td>
</tr>
<tr>
<td>71 D&amp;G</td>
<td>Wrenbury-Nantwich (School Service for Malbank School)</td>
<td>08:15</td>
<td>16:15</td>
<td>School AM peak (08:00) and school PM peak (15:00) during term time</td>
<td>No service</td>
<td>No service</td>
</tr>
<tr>
<td>72 D&amp;G</td>
<td>Nantwich – Wrenbury - Whitchurch</td>
<td>07:35</td>
<td>18:13</td>
<td>Hourly</td>
<td>Hourly</td>
<td>No service</td>
</tr>
<tr>
<td>73 D&amp;G</td>
<td>Nantwich – Audlem – Whitchurch</td>
<td>07:45</td>
<td>20:49</td>
<td>Hourly</td>
<td>Hourly</td>
<td>No service</td>
</tr>
</tbody>
</table>
It should be noted that CEC are currently undergoing a review of supported bus services and therefore potential route/timetable changes are being considered to some of the above services. The outcomes of the review will be known by April 2018.

The frequency and direction of travel for all services is summarised below:

- The 39 service operates in an eastbound and westbound direction calling at Nantwich bus station and Malbank School;
- The 51, 52 and 53 Circular Routes operate in an eastbound and westbound direction on Welsh Row on an hourly service;
- The 56 service operates in an eastbound and westbound direction on Welsh Row. The operator provides 2 daily services on a Thursday and Saturday;
- The 68 service operates in an eastbound and westbound direction via Nantwich bus station and Malbank School;
- The 71 bus service operates an AM service at 08:15 to Malbank School which travels onwards from the school in an eastbound direction along Welsh Row. The return service (15:15) operates in a westbound direction on Welsh Row;
- The 72 bus service from Nantwich to Whitchurch travels in both an eastbound and westbound direction on Welsh Row operating one bus per hour, with the exception of two buses per hour in the peak AM period;
- The 73 service operates in an eastbound and westbound direction via Nantwich bus station and Nantwich rail station;

- The 79 service operates via Waterlode with two services on Fridays only;

- The 83 service operates every Tuesday, in both an eastbound and westbound direction via Nantwich bus station;

- The 84 service from Crewe to Chester operates an hourly service along Welsh Row; and

- The 89 bus service operates two services on a Monday only.

It is therefore evident that all services travel in both an eastbound and westbound direction and therefore either Option 1 or Option 2 would equally have significant implications on bus operation.

### 3.3 Routing Implications

In order to maintain bus operation to a similar route as at present, this would require the following diversions.

For Option 1 (Welsh Row one-way eastbound):

- Eastbound buses as existing; and

- Westbound buses to route on Waterlode from the junction with High Street/Welsh Row to junction of Taylor Drive/Chester Road/Welsh Row, routing on Welsh Row to the junction with Queens Drive, on Queens Drive to the junction with Millfields, on Millfields to the junction with Edmund Wright Way, and on Edmund Wright Way to the junction of Taylor Drive/Welsh Row/Waterlode, then to Chester Road.

For Option 2 (Welsh Row one-way westbound):

- Westbound buses as existing; and

- Eastbound buses to route on Welsh Row to the junction with Queens Drive, on Queens Drive to the junction with Millfields, on Millfields to the junction with Edmund Wright Way, and on Edmund Wright Way to the junction of Taylor Drive/Welsh Row/Waterlode, then Waterlode to the junction with Taylor Drive/Chester Road/Welsh Row.

The above options would maintain existing services on Welsh Row, but would involve additional bus movements on Waterlode, Queens Drive and Millfields, as well as introducing bus services to Edmund Wright Way and Taylor Drive. This would have implications for bus service calling times and overall journey lengths, while also having capacity implications by increasing turning movements at the above junctions.

As an alternative to the above, it would be possible to maintain existing operation of bus services in both directions by modifying either Option 1 or Option 2 such that buses could still operate in both directions on Welsh Row. In practice, this would mean implementing a ‘bus gate’ such that either:
For Option 1 at the Welsh Row/Waterlode/High Street junction, movements into Welsh Row were banned for all vehicles except buses; or

For Option 2, at either the Welsh Row/Queens Drive junction or the First Wood Street junction further east, movements to the eastern arm (Welsh Row) were banned for all vehicles except buses.

With Option 1, Welsh Row would remain two-way for its full extent, the only change would be that non-bus movements into Welsh Row from the Welsh Row/Waterlode/High Street junction would be banned. This would allow vehicles on Welsh Row to access businesses, parking and properties located on Welsh Row, First Wood Street, Second Wood Street and St Anne’s Lane in both directions from Welsh Row.

With Option 2, Welsh Row would become one-way at either the Queens Drive junction (as assumed in the Phase 2 TA), or at the junction with First Wood Street. This would be to allow vehicles travelling eastbound an opportunity to divert or turn around before reaching the one-way section. Locating this at Queens Drive would have the disbenefit of limiting access to businesses, parking and properties located on Welsh Row, First Wood Street, Second Wood Street and St Anne’s Lane, while locating this at First Wood Street would require vehicles to utilise First Wood Street-Cross Wood Street-Second Wood Street as a turning loop; given the narrow carriageway widths of these roads.

Given that most services have an hourly operation, the inclusion of bus movements within the traffic signal cycle at the Welsh Row/Waterlode/High Street junction would have negligible impacts on junction performance from those outlined in Section 2.

3.4 Conclusions of Bus Service Review

From the alternatives of re-routing bus traffic or maintaining two-way operation for buses at the junction of Waterlode/High Street/Welsh Row via a ‘bus gate’, it is recommended that a ‘bus gate’ option be implemented. This would allow for services to continue along their current routes, and since given that frequency of services is relatively low, this should not cause significant delays at the junction of Welsh Row/Waterlode/High Street junction.

In respect of the operation of a ‘bus gate’ for either Option 1 (Welsh Row one-way eastbound) or Option 2 (one-way westbound), it is considered that Option 1 be preferable. This is because this option would maximise access to businesses, parking and properties located on Welsh Row, First Wood Street, Second Wood Street and St Anne’s Lane, while avoiding the requirement for vehicles to turn around/divert on other roads on the highway network.

The above turning restrictions would need to be given effect by the implementation of Traffic Regulation Orders (TROs). In order to allow access for buses-only, the ‘bus gate’ could be enforced either physically by the provision of retractable bollards on the approach to Welsh Row from the junction, or by the provision of Automatic Number Plate Recognition (ANPR) cameras which would observe vehicles travelling westbound on the Weaver Bridge.
While the potential measures described in this study would have implications for vehicle routing on the local highway network, other than recommending one-way sections of carriageway, detailed consideration to traffic management is not provided within the Phase 2 TA.

Outlined below is a review of the existing situation, based on a site walkover on 10th October 2017. The review considers existing traffic management measures and any amendments to be implemented as a result of the potential road alterations.

4.1 Existing Traffic Management Measures

From a site visit undertaken on the 10th October 2017, several observations were made with regard to traffic management within the study area. Based on this site visit and discussions with officers at CEC Highways, a review of existing traffic management measures is presented below.

4.1.1 Parking Restrictions

The following parking restrictions are in place within the study area:

- ‘No Waiting At Any Time’ (NWAAT) restrictions are in place on Queens Drive on the approach to the junction with Welsh Row;
- NWAAT parking restrictions are in place at the northern extent of Marsh Lane at the junction with Welsh Row for a distance of circa 70m, although on the western side of the road, these are only daytime restrictions (08:00 – 18:00 Monday-Saturday);
- Multiple NWAAT restrictions on Welsh Row;
- ‘School – Keep Clear’ waiting restrictions (09:00 – 17:00) outside Malbank Secondary School and Sixth Form on Welsh Row are in place; and
- Waterlode is single carriageway in each direction and has NWAAT parking restrictions in place for its full length.

Marked, intermittent on-street parking bays exist on Welsh Row to the east of Marsh Lane, and were observed to be well-utilised, as shown in Figure 1.
4.1.2 Physical Traffic Calming

Vertical traffic calming measures are currently present on:

- Marsh Lane; and
- Edmund Wright Way.

A kerb build-out/chicane one-way operation is also present on Welsh Row outside Malbank School.

4.1.3 Weight Restrictions

From a review of Figures 11 and 12 in the Phase 2 TA, it is evident that the roads which experience the greatest number of heavy vehicle movements are:

- The A354 Chester Road/Welsh Row in both directions;
- A534 Waterlode to the A534 Chester Road with HGVs travelling in a south west direction; and
- South on the A534 Waterlode with many HGVs taking a right turn towards the A530 High Street at the crossroad junction

Notwithstanding the above, the only weight restrictions in place on the roads directly affected by the study area are on Marsh Lane.
4.2 Existing Network Operation

4.2.1 Welsh Row

Multiple sections of NWAAT parking restrictions are present along Welsh Row, particularly outside Malbank School. Further eastwards towards the junction of Marsh Lane/Waterlode/High Street, on-street parking bays are provided, reflecting the retail nature of development at this end of the road.

The introduction of parking restrictions to limit on-street parking is closely linked to weight restrictions. A review of the TA suggests that the unclassified Welsh Row accommodates a similar volume of heavy vehicle traffic as the classified route A534 Waterlode. Given that Welsh Row forms the central route of a conservation area, it is considered to be beneficial to minimise heavy vehicle traffic on this route, while maintaining service access for local residents and businesses. As such, a 7.5t weight restriction (except for access) is in place for the full length of Welsh Row.

In light of the above, it is considered that traffic management measures in the form of further parking restrictions would not be necessary on Welsh Row for the purposes of this study. Instead, the aforementioned package of measures on the local highway network would have the effect of reassigning a significant proportion of heavy vehicle traffic to the more appropriate classified route A534 Waterlode.

Notwithstanding the above, it may be beneficial for CEC to undertake a detailed review of parking restrictions and parking provision on Welsh Row to fully optimise the flow of traffic while maintaining access to local residences and businesses.

4.2.2 Taylor Drive

Some on-street parking was observed at the northern end of Taylor Drive adjacent to the junction with Chester Road/Welsh Row/Waterlode. This can be seen in Figure 2, looking northwards towards the junction.
Given the estimated increases in vehicular flows on Taylor Drive that would result from the creation of the Taylor Drive/Edmund Wright Way link, there may be a case for introducing parking restrictions in order to maintain a clear route. However, the following considerations should also be noted:

- Parking was observed on the eastern side of the carriageway only, i.e. in the southbound lane. As such, this would not directly interfere with queuing traffic approaching the signalised junction;

- Should on-street parking generate operational and/or safety concerns upon the introduction of the Edmund Wright Way/Taylor Drive link, it may be possible to introduce part-time restrictions only, i.e. between the hours of 08:00 – 18:00 to manage vehicles peak hours, while allowing for residents to continue to park on-street during off-peak hours.

### 4.2.3 Edmund Wright Way

Some on-street parking was observed during the site visit on Edmund Wright Way, as shown in Figure 3, although this is to a significantly lower degree than on Taylor Drive. As such, it is considered unlikely that on-street parking restrictions would be beneficial.

The road is currently subject to physical traffic calming by way of speed humps, located at circa 30m intervals, with a total of four humps between the existing bend south of Taylor Drive and the junction with Marsh Lane/Millfields.
It is noted that, after the implementation of a Taylor Drive/Edmund Wright Way link, the new through-route would provide traffic calming at the southern end (i.e. Taylor Drive) and none at the northern end (i.e. Edmund Wright Way). Notwithstanding the road’s amended function as a through-route, the nature of traffic accommodated by the roads would remain predominantly residential and as such, it would be considered a retrograde measure to remove existing traffic calming, particularly given the proximity of Millfields Primary School.

Conversely, based on the information available at the time of the present study, it is not considered necessary to extend traffic calming to Taylor Drive to provide a consistently traffic-calmed route, given that speeds at this end of the route would be managed by the proximity of the signalised junction with Welsh Row/Chester Road/Waterlode, and given that this end of the road is not in the vicinity of Millfields Primary School. Notwithstanding this, traffic calming could be considered in future should concerns arise, which could be informed by speed surveys undertaken once the potential link is in operation.

4.2.4 Marsh Lane

The Phase 2 TA describes the following proposal for Marsh Lane:

‘Millfields Primary School is located off the northern section of Marsh Lane, and has ‘School – Keep Clear’ waiting restrictions (9am – 5pm) in place, but in order to further improve pedestrian safety close to the school, especially during the morning and evening peaks, it is proposed to make Marsh Lane one way between Welsh Row and Millfields.’

The one-way operation detailed within the Phase 2 TA is based upon a southbound direction and it is noted that the Phase 2 TA did not consider the possibility of
operating Marsh Lane one-way in a northbound direction. The geometry of the junction with Welsh Row is considered to be sub-standard, with a narrow carriageway width and the potential for visibility onto Welsh Row to be restricted by parked vehicles, and it is instead considered preferable from this perspective for northbound vehicles to route via Edmund Wright Way/Taylor Drive.

Notably, the Phase 2 TA does not expand upon the way in which a one-way scheme would ‘further improve pedestrian safety’, while the accident data review within the TA does not identify any accidents as having occurred on Welsh Row.

Notwithstanding the above, it was evident during a site visit undertaken during the daytime off-peak period on 10th October 2017 that there is a significant amount of on-street parking on Welsh Row. This results in vehicles frequently needing to stop to allow passing due to parking creating effective single-lane passing sections, frequently with the passing section being five or more cars long (Figures 4 and 5).
Given the presence of a primary school on the road and the narrow width of the carriageway, there would be a case to consider extending southwards the existing parking restrictions that are in place at the northern end of the road at the junction with Welsh Row. However, given that a number of properties on the route do not have off-street parking provision, this may result in significant enforcement issues and/or dispersal of the problem to other streets.

One-way operation on the route would remove the potential for vehicles to need to pass, which would address the concerns raised above. Indeed, given that there are currently two lanes provided and only one lane would be needed with the one-way operation in place, it would be possible to formalise on-street parking provision. This could be implemented providing parking bays on one side of the carriageway, supported by parking restrictions on the opposite side. This would need to be subject to an additional detailed study, and is not considered necessary for the purposes of implementing the scheme detailed in the present report.

4.3 Recommended Traffic Management Measures

Based on the review of the existing network in this section, the following recommendations can be made from a traffic management perspective in relation to the potential package of measures:

- No new parking restrictions or traffic management measures are considered to be necessary on Welsh Row, although this does not preclude a future study on these matters to optimise traffic operation and road safety;

- There may be a case for considering parking restrictions on Taylor Drive if the link with Edmund Wright Way were to be implemented; however, this would depend on a review of any operational and safety concerns once the link is in operation;

- There is unlikely to be a case for considering parking restrictions on Edmund Wright Way, while it is considered appropriate that existing traffic calming measures remain in place; and
• The implementation of one-way operation on Marsh Lane would be beneficial to address existing on-street parking issues. There may be a case to consider extending existing parking restrictions, which could be accompanied by the formalisation of on-street parking provision, although these are not considered to be necessary to implement the one-way operation.
5.1 Summary

Jacobs has been appointed by Cheshire East Council to review proposals for improvements to the local highway network and to make recommendations as to a preferred scheme and the next steps required for its implementation.

An improvement scheme on the highway network within west Nantwich was proposed by Gladman Developments Ltd within the Transport Assessment (TA) for the Queens Drive Phase 2 residential development in 2014. This comprised the creation of a new vehicular through-route between the existing culs-de-sac at Taylor Drive/Edmund Wright Way alongside ‘traffic management measures’, the implementation of a one-way southbound operation on Marsh Lane and two alternatives for one-way operation on Welsh Row. It was concluded within the Highways Development Control consultation response that the above improvement measures would be required in order to mitigate the impact of the Phase 2 development.

As part of the present study, Jacobs has undertaken a review of the analysis within the Queens Drive Phase 2 TA. The methodology within the Phase 2 TA appears to be broadly acceptable, and the traffic modelling results would indicate that, of the two options presented for Welsh Row, Option 1: One-Way Eastbound operation would be preferable in respect of providing additional capacity on the highway network. However, the Phase 2 TA does not provide a consideration of impacts on buses or traffic management implications of the proposals and as such does not identify a preferred option. Therefore, these issues have been considered within the present study.

From the alternative options for buses at the junction of Waterlode/High Street/Welsh Row it is recommended that a ‘bus gate’ option be implemented. This would allow for services to continue along their current routes, and given that frequency of services is relatively low, this should not cause significant delays at the junction of Welsh Row/Waterlode/High Street junction.

In respect of the operation of a ‘bus gate’ for either Option 1 (Welsh Row one-way eastbound) or Option 2 (one-way westbound), it is considered that Option 1 be preferable. This is because this option would maximise access to businesses, parking and properties located on Welsh Row, First Wood Street, Second Wood Street and St Anne’s Lane, while avoiding the requirement for vehicles to turn around/divert on other roads on the highway network.

While the potential changes to the network have implications for vehicle routing on the local highway network, other than recommending one-way sections of carriageway, detailed consideration to traffic management is not provided within the Phase 2 TA. A review of existing traffic management measures on the highway network as part of the present study found that there may be a case for considering parking restrictions on the approach to Taylor Drive should operational or safety concerns arise after the implementation of the Edmund Wright Way/Taylor Drive link, while there may be a case for considering extending existing parking restrictions accompanied by formalisation of on-street parking provision on Marsh Lane. Notwithstanding this, no specific traffic management measures are
considered necessary to allow the potential package of improvements to be implemented.

5.2 Conclusion

In conclusion, the study has identified the following preferred option for consideration by CEC highways:

- The implementation of a vehicular link connecting Taylor Drive and Edmund Wright Way;
- The implementation of southbound one-way operation on Marsh Lane;
- The implementation of turning restrictions at the junction of Welsh Row/Waterlode/High Street, which would ban movements into Welsh Row from all other arms;
- An exemption for buses for the above turning restrictions at the junction of Welsh Row/Waterlode/High Street.

The following measures could be considered to support the preferred option, although are not necessary for its implementation:

- Parking restrictions on the eastern side of Taylor Drive on the approach to the junction with Chester Road/Waterlode/Welsh Row;
- The extension southwards of existing parking restrictions on Welsh Row on one side of the carriageway, with demarcated parking bays provided on the other; and
- Consideration should be given to amending the priorities of arms at Edmund Wright Way/Marsh Lane/Millfields junction, and a capacity assessment may be beneficial at this location prior to the implementation of any other measures.

5.3 Next Steps

It is recommended that CEC Highways undertake a public engagement exercise with local residents at the earliest opportunity, in order for any local concerns to be raised and necessary adjustments to the potential road improvements to be made if necessary.

Once a preferred scheme has been identified, it may be beneficial to undertake an Order of Magnitude Cost Estimate to give an indication of the costs of implementing the measures.

It is recommended that a Stage 1/2 Road Safety Audit is undertaken for any scheme proposals once a preferred design is identified.

The Taylor Drive/Edmund Wright Way link would require a planning application, supported by any necessary technical evidence identified during scoping discussions with CEC’s Planning department and any statutory consultees. As part of this process, the views of statutory consultees and local residents would need to be considered further to the above mentioned engagement exercise.
The implementation of one-way operation on Marsh Lane, and the restriction of turning movements at the junction of Welsh Row/Waterlode/High Street would need to be given effect by Traffic Regulation Orders. As part of this process, the views of local residents would need to be considered further to the above mentioned engagement exercise.