# 5 Transportation

## 5.1 Introduction

This section of the EIS presents a traffic and transport assessment of the proposed M7 Osberstown Interchange and R407 Sallins Bypass Scheme, the proposed scheme.

The Transportation Assessment chapter is set out as follows:

- Scheme Description (Section 5.2).
- Transport context (Section 5.3).
- The assessment methodology (Section 5.4).
- Operational assessment of the proposed scheme (Section 5.5).
- Predicted impacts (Section 5.6).
- Scheme mitigation measures and residual impacts (Section 5.7).

## 5.2 Scheme Description

The proposed scheme, as described in detail in Chapter 4 - *Description of the Proposed Scheme*, comprises the construction of a new motorway interchange on the M7 Naas Bypass, the M7 Osberstown Interchange and a bypass of Sallins Town, the R407 Sallins Bypass. As discussed in Section 3.1, the proposed scheme is dependent sequentially on the completion of the proposed 'M7 Naas to Newbridge By-Pass Upgrade Scheme'.

The traffic modelling work, as set out in Section 3.3.4.2 and described in detail in the traffic modelling report, included as **Appendix A5.1, V4,** informed the early scheme optioneering, design development and the establishment of the proposed scheme.

The proposed scheme comprises the following road links and junctions (see **Figure 1.2 V3**):

- A grade separated dumb-bell interchange north-west of Naas town centre connecting the M7 Motorway with the proposed R407 Sallins Bypass and with the L3012 Western Distributor Road.
- The R407 Sallins Bypass from the M7 Osberstown Interchange to the R407 Clane Road north of Sallins and a new link road from the bypass to Sallins town centre (the Sallins Link Road). The details of the proposed bypass are outlined below:
    - Dual carriageway road section from the proposed M7 Osberstown Interchange to the proposed Sallins Link Road Roundabout .
    - A single carriageway cross- section from the proposed Sallins Link Road Roundabout to the proposed R407 roundabout north of Sallins.
    - A new roundabout junction on the R407 Clane Road north of Sallins town connecting to the proposed bypass.

- Upgrading of the existing traffic signal junction control at Millbank / Sallins Road Junction where the proposed Sallins Link Road joins Sallins Main Street.

In addition to the above, the proposed R407 Sallins Bypass may facilitate an additional junction in the future, providing an access to a planned 'Public Transport Interchange' as identified by Transport Objective PT5 of the Sallins LAP (refer to Chapter 2).

## 5.3 Transport Context

### 5.3.1 Receiving Environment

#### 5.3.1.1 Existing Road Network

The N7 is a 3-lane dual carriageway with hard shoulders that travels from Newlands Cross, Co Dublin to the North Eastern Corner of Naas, at the Maudlins Interchange. It has a speed limit of 100km/h.

At this location the N7 terminates and becomes the M7 Motorway, bypassing Naas to the north and west of the town. The M7 is a two lane motorway with hard shoulders. The M7 has a 120km/h speed limit.

There are two motorway interchanges located along the M7 that provide access to Naas and its environs, at Maudlins as described above and Newhall located to the west of the town. The Maudlins Interchange (Junction No.9) is a j-type junction with a single roundabout, known as the 'Maudlins' roundabout. The roundabout is located on the south side of the M7/N7 providing access to the National Primary Road network for regional and local traffic from the R445 and Monread Road.

The Newhall Interchange (Junction No.10) consists of a composite dumb-bell and extended 's-type' interchange with roundabouts on both sides of the M7, providing access to the National Primary Road network for local and regional traffic from the R445 and the L2030.

An internal distributor ring road for Naas has been completed by Kildare County Council (KCC) in recent years. The 'Western Distributor Road' section of the ring road parallels the M7 from its roundabout junction with the existing R407 Sallins Road and continues over the Grand Canal, passing through five roundabouts and terminating at the R445/Newbridge Road roundabout. The 'Western Distributor Road' is a single-lane carriageway with generous pedestrian and segregated off road cycle facilities along its route.

The R407 Regional Route is an important north-south traffic corridor linking Naas with Clane and Kilcock and the N4 to the north of the County. The R407 as it approaches Naas is a single carriageway road. The R407 route currently travels through the centre of Sallins which, together with a number of priority access junctions on the route to the south of Sallins, contributes to congestion on the R407 along this section of the regional road corridor.

The 'Monread Road', is a local distributor road which runs parallel to the M7 from the R407 Sallins Road / Western Distributor Road Roundabout Junction as far as the 'Maudlins Roundabout' of the M7 Maudlins Interchange.

This road is a single carriageway road with a speed limit of 60km/h. There is a relatively new roundabout junction on this road link, to the east of the Sallins Road Roundabout providing access to a Tesco's anchored retail centre and an Aldi Store.

There are numerous 'priority' junctions and one signal controlled junction providing access to residential and commercial development along the Monread Road. At the eastern end of the road link, there is another roundabout junction, prior to the 'Maudlins' roundabout which provides access to a retail park on the M7 side of the road and mixed retail and commercial development on the Naas town side. This road link therefore caters for a mix of local traffic as well as regional traffic from the R407 which use it to access the N7 at Maudlins.

Other roads in the immediate vicinity of the proposed interchange include the 'Osberstown Road', a local rural road, to the north of the N7, and Mill Lane / Canal Road which runs north-south passing underneath the N7 to the east of the proposed interchange location. Mill Lane / Canal Road is a rural local access road which provides an amenity route for walking and cycling locally.

#### 5.3.1.2 Public Transport

The nearest rail station is the Sallins Train Station, located approximately 3 km away from the proposed scheme. There are 400 car parking spaces available at the station.

The following train services stop at the Sallins Train Station:

- Dublin to Kildare/Portlaoise-Commuter service (AM and PM peak hour frequency of 20 min & 10-15 min respectively).
- Dublin to Cork/Limerick/Tralee (one service in the peak hour).
- Dublin to Waterford (one service in the peak hour).
- Dublin to Galway (one service in the peak hour).

In total, based on Iarnrod Eireann's weekday timetable, there are 23 commuter trains and 5 intercity trains heading northbound, which stop at Sallins en route to Dublin, and 20 and 5 commuter trains / intercity trains respectively in the other direction, southbound (i.e. total 53 scheduled services stopping in Sallins).

Regional bus services to Naas are primarily routed through the centre of Naas town (R445 Newbridge Road, Main Street and Dublin Road).

In Sallins, the nearest Bus Éireann stops are located on the R407 Sallins Road opposite to the Sallins Train station and next to 'Banburys'. Details of Bus Éireann routes and peak hour frequency are as follows;

- Route 120: Dublin – Tullamore (one service in the peak hour).
- Route 123: Naas/Newbridge – Dublin via Sallins and Clane (one service in the peak hour, 30 min frequency with link to Route 120).
- Route 126 and 126N: Dublin – Kildare (one service in the peak hour).

In addition, Dublin Coach and other private operators also operate bus services linking Naas with Dublin; they include:

- Dublin Coach – Portlaoise to Dublin Airport.
- J. J. Kavanagh & Sons.
  - Waterford/Tramore to Dublin Airport via Naas.
  - Clonmel/Kilkenny and Dublin Airport via Naas.
  - Naas to Clane via Sallins (high frequency bus service).

In summary, approximately 99 buses northbound and 79 southbound (20 operators) are routed through and stop in Market Square in the centre of Naas on a daily basis.

Rail access to Naas and environs is facilitated by the Sallins Train Station on the Dublin to Cork railway line.

Commuter Services to and from Dublin as well as a limited number of inter-city services stop at Sallins Train Station.

#### 5.3.1.3 Pedestrian and Cycle Networks

Currently, relatively limited walking or cycling activity is observed along the adjacent road network. There are however well developed pedestrian and cyclist facilities along the immediate roadways such as those located on the Carragh Road, Sallins Road and the Western Distributor Road (including the southern ring). Cyclist facilities along the Western Distributor Road and the R409 Carragh Road are provided as off-road dedicated cycle tracks. Cycle lanes are also provided along sections of the Sallins Road but are not continuous along the route between Sallins and Naas Town Centre.

The majority of the roundabouts along these roads are designed to accommodate pedestrian crossings (unsignalised with dropped kerbs) on all their approaches.

Observed low pedestrian and cyclist activity in the vicinity of the proposed scheme is due to the limited amount of development in the area. It is envisaged that as the Naas Northwest Quadrant area develops, pedestrian and cyclist activity locally to the proposed scheme will increase.

### 5.3.2 Planned Future 'Land-use' and Transport Development

#### 5.3.2.1 Future Land-use Development

The planning policy background to the proposed scheme is described in detail in Chapter 2 -*Planning and Policy*, with additional zoned development lands identified within the relevant Development Plans as follows;

- Naas Town Development Plan 2011-2017 (as produced in **Figure 2.3V3**).
- Kildare County Council (KCC) Development Plan 2011-2017 and Variation No. 1.
- Sallins Local Area Plan (LAP) 2009.

The primary area identified for future expansion and growth in Naas and environs is the Northwest Quadrant area, which is immediately adjacent to the proposed scheme.

#### 5.3.2.2 Road Network (Do-Minimum) Assumptions

### M7 Naas to Newbridge By-Pass Upgrade Scheme

The existing M7 Naas Bypass was designed in the 1970's and was opened to traffic in 1983. The Maudlins Interchange was partially upgraded as part of the N7 Widening Scheme in 2006.

Both the existing Naas interchanges on the M7 experience congestion at peak periods, particularly the Newhall Interchange, and this is set to continue in the absence of intervention as a result of continued planned population growth locally in accordance with National, Regional and Local Planning Policy, and the anticipated continued background growth in traffic volumes along the M7 Corridor.

When the previous planning application for the proposed M7 Osberstown Interchange scheme was made in 2008, prevailing traffic conditions and modelled future traffic growth established a clear benefit for the interchange in balancing the traffic flows between the local and regional road network and along the M7 Naas Bypass. As a result the M7 Osberstown Interchange was seen to extend the life-span of the existing motorway interchanges at Maudlins and Newhall. The 2008 traffic assessment also acknowledged that the M7 mainline motorway would need to be upgraded at a future point in time as traffic demand and capacity constraint dictated.

While 'Annual Average Daily Traffic Volumes' (AADT) on the M7 Naas Bypass have remained relatively constant between 2006 and now, peak period morning and evening commuter traffic volumes have risen considerably, as set out in Table 5.1 below.

**Table 5.1: M7 Naas Bypass AADT and peak hour traffic volume in 2006 and 2012**

| Direction | 2006* | | 2012# | | |
|---|---|---|---|---|---|
| | AADT (in PCU) | AM peak (% of AADT) | AADT (in veh) | AM peak (% of AADT) | PM peak (% of AADT) |
| M7 Eastbound | 31,700 | 2,350 (7.4%) | 30,497 | 3,332 (10.9%) | 1,978 (6.5%) |
| M7 Westbound | 26,450 | 2,000 (7.6%) | 29,094 | 2,027 (7.0%) | 3,619 (12.4%) |
| Two-Way | 58,150 | 4,350 (7.5%) | 59,591 | 5,359 (9.0%) | 5,597 (9.4%) |

Source:

*- Arup 2008 M7 Osberstown Interchange EIS

# - 2012 Traffic surveys

PCU = Passenger Car Units

Motorway capacity standards applicable to the M7 Naas Bypass, including acceptable levels of traffic on a roadway, are defined in the NRA DMRB TD 9/12. Based on this document the 'Capacity' AADT of the M7 Naas Bypass for an appropriate level of service, having a 'Wide Motorway' cross-section was calculated at a volume of 55,500 vehicles. In general, a section of two-lane motorway with recorded AADT of 55,000 vehicles or above would expect to experience congestion. AADT numbers less than this threshold would be considered to be within the accepted road capacity levels.

The actual capacity of a roadway however can be higher or lower than the theoretical capacity, and is dependent on a number of factors, most critically upon the proportion of peak hour traffic.

TA 46/97 provides guidance on this with reference to 'Congestion Reference Flows' (CRF's). CRF's are defined as:

*The Congestion Reference Flow (CRF) of a link is an estimate of the Annual Average Daily Traffic (AADT) flow at which the carriageway is likely to be 'congested' in the peak periods on an average day. For the purposes of calculating the CRF, 'congestion' is defined as the situation when the hourly traffic demand exceeds the maximum sustainable hourly throughput of the link. At this point the effect on traffic is likely to be one or more of the following: flow breaks down with speeds varying considerably, average speeds drop significantly, the sustainable throughput is reduced and queues are likely to form.*

*This critical flow level can vary significantly from day to day and from site to site and must be considered as an average. The CRF is a measure of the performance of a road link between junctions. The effect of junctions must be considered separately.*

The minimum desirable CRF AADT for a 2-lane motorway standard roadway is 65,000 (two-way). If the calculated CRF AADT values for a two-lane motorway road are less than 65,000, this will result in congestion, whereas CRF AADT greater than this indicate acceptable driving conditions.

Based on surveyed traffic volumes on the M7 from 2006, the calculated CRF was in the order of 89,000 AADT, and above the minimum desirable CRF level resulting in acceptable driving conditions.

Based on the more recent traffic count information from 2012, the CRF value has reduced considerably to just over 61,000 AADT, reflective of the increase in peak commuter period traffic volumes, thereby confirming the necessity to upgrade the M7 Naas Bypass to dual-three lane standard in advance of the proposed M7 Osberstown Interchange and R407 Sallins Bypass Scheme.

On this basis, the proposed KCC 'M7 Naas to Newbridge By-Pass Upgrade Scheme' is included as part of the scheme 'do-minimum' scenario in terms of traffic impact assessment.

## R407 Sallins Road / Monread Road Roundabout Upgrade

The existing R407 Sallins Road / Monread Road roundabout is currently operating over capacity during peak morning and evening commuter traffic periods and requires upgrading to cater for existing traffic flows.

The upgrading of the R407 Sallins Road / Monread Road Roundabout has also been identified as an Infrastructure objective within the Naas Town Development Plan – '*RWO6: To seek to improve road junctions at the following locations: (g) Sallins Road and Monread Road*'.

On this basis, an allowance for an upgrading of the junction to meet more immediate local road network and development needs has been made as part of the proposed scheme 'Do-minimum' scenario. The form of this junction upgrade remains to be determined by KCC. For the purposes of this assessment, an enlarged roundabout has been assumed for modelling purposes. Should the alternative of a signal controlled junction option be developed, it is likely to have similar additional peak hour capacity provision and would not therefore alter the modelled road network traffic impacts. The impact of the inclusion of this junction upgrade in the Do-minimum scenario was also considered as part of the proposed scheme options assessment work undertaken and as reported in **Appendix A3 V4**.

#### 5.3.2.3 Public Transport Network Improvements

### Kildare Route Project

The overall objective of the Kildare Route Project on the South-western (Kildare) rail corridor is to provide additional rail line capacity and frequency on the Cork-Dublin rail line for commuter train services to match future demand for rail transport. Upgrade works in recent years has seen the addition of new commuter rail stations and the four-tracking of the line between Cherry Orchard and Hazelhatch, separating intercity from commuter trains. The next phase of the project, which is linked to the DART Underground project, is an extension of the four-tracking eastwards from Cherry Orchard as far as Inchicore Station and electrification of the line as far as Hazelhatch.

The next phase of the Kildare Route Project, which would see the four-tracking extended further east between Hazelhatch and Kildare Town, which includes Sallins Town Station, has however now been deferred, following the reduction in the Exchequer Capital investment programme, and is therefore now realistically considered to be a long-term transport objective in terms of delivery.

### Regional Public Transport Interchange

The Sallins LAP transport objective PT5 envisages the establishment of a Regional Public Transport Interchange (PTI) on lands adjacent to the proposed R407 Sallins Bypass. The PTI would incorporate the development of an expanded Naas and Sallins railway station and an associated 'Strategic Park and Ride' for M7 corridor traffic, via the proposed scheme. The PTI would also make provision for a regional bus hub and interchange.

As discussed earlier, while the proposed scheme will facilitate such a PTI in the future, the objective is long term in nature and is unlikely to precede the delivery of Phase 2 of the Kildare Route Project.

#### 5.3.2.4 Pedestrian and Cycle Networks Improvements

In August 2013, the NTA published the 'Draft Greater Dublin Area' Cycle Network Plan. This Cycle Network Plan sets out an integrated plan for the continued development of the Urban, Inter-Urban and Green Route cycle networks for the seven Local Authorities comprising the Greater Dublin Area (GDA), including Kildare County Council.

The Draft GDA Cycle Network Plan includes a cycle network for Naas, Sallins and Kill (Sheet N18). KCC are currently working on the planning for the provision of new or upgrading of existing cycle infrastructure and facilities on a number of the cycle routes identified in the Draft Cycle Network Plan.

These include Primary Cycle Route N2, aimed at improving the pedestrian and cyclist environment along the R407 between Sallins and Popular Square in Naas, the N6 Cycle Route along the Monread Road and the N1 Cycle Route along the R445 Dublin Road.

The proposed improvements on Route N2, in proximity to the proposed scheme, primarily involve the provision of dedicated cycle facilities and improvements to the operation of the various junctions located along the roadway including the Sallins Road Roundabout.

In addition, the Cycle Network Plan includes for the development of an amenity Green Route, K13, from Naas Town Centre, along Mill Lane / Canal Road, connecting to Route K10, extending along the Grand Canal. Route K10 will ultimately provide a continuous amenity cycle and pedestrian route into Dublin, with sections of the route already well established.

## 5.4 Assessment Methodology

### 5.4.1 General Methodology

The transport assessment looks at the impact of the proposed scheme for an opening year, 2015 and a design year, 2030. The assessment is based on comparing 'without scheme' (or 'Do Minimum' or 'DM') and 'with scheme' ('Do-Something' or 'DS') scenarios.

The transport model used for the operational assessment of the proposed scheme was developed initially by AECOM for the 'M7 Naas to Newbridge By-Pass Upgrade Scheme'. This comprised the development of a validated 2012 base year Local Area Model (LAM) based on the NRA's National Transport Model (NTM).

The NTM model is currently used as a tool as a part of NRA's Project Appraisal Guidelines (PAG) for the assessment of highway infrastructure schemes.

The extent of the LAM study area is illustrated in **Figure 5.1 V3**.

In order to ensure a consistency of traffic modelling approach between the two proposed schemes, it was agreed that the AECOM 2012 LAM would be used for the M7 Osberstown Interchange and R407 Sallins Bypass Scheme, subject to increased refinement to reflect some of the existing and future zoned land-uses within the Naas and Sallins hinterland as identified by the Development Plans.

### 5.4.2 Data Collection

A suite of traffic survey information was collected both by AECOM and Arup, which informed development of the 2012 LAM. A summary of the traffic survey information collected to support the traffic model development is presented below:

- Origin-Destination (O-D) 'bluetooth' surveys carried out between the 17th and 19th April 2012 at 6 sites.
- 11 Automatic Traffic Counts (ATC) carried out between the 6th and 12th February 2012.
- One ATC was carried out for a 2 week period starting from 20th November 2012 on the R407 Clane Road.
- Data from 3 NRA Permanent ATC's from 2010 to 2012.
- 10 Manual Classified Counts (MCC) undertaken over 12 hours (07:00 – 19:00) on Tuesday the 7th of February 2012.
- 10 Junction turning counts undertaken over 12 hours (07:00 – 19:00) on Tuesday the 20th November 2012.
- Journey time information collected as a part of 'bluetooth surveys' (7 routes) between the 17th and 19th April 2012.
- Journey time surveys conducted along 4 routes on Tuesday the 20th November 2012.

All the above traffic count locations are shown in **Figure 5.2 V3.**

### 5.4.3 Model Development

The AECOM 2012 LAM was built and then calibrated and validated to 2012 morning (AM); inter peak (IP) and evening (PM) traffic levels using the 'PTV VISUM' transportation modelling software.

Full details of the NTM and LAM development are included in the traffic modelling report prepared by AECOM included as **Appendix A5.1 V4** and are summarised in the following sections.

#### 5.4.3.1 Model Calibration

The 2012 base year model LAM model calibration process has been undertaken fully in accordance with the requirements of *NRA Project Appraisal Guidelines Unit 5.2: Construction of Traffic Models*.

The standard method used to compare modelled values against observations on a modelled road network involves the calculation of the 'GEH' statistic. The GEH statistic is a measure of comparability that takes account of not only the difference between the observed and modelled flows, but also the significance of this difference with respect to the size of the observed flow. The GEH statistic is calculated as follows:

$$GEH = \sqrt{\frac{(M - 0)^2}{0.5(M + 0)}}$$

Where M = Modelled Flow and O = Observed Flow.

The model validation process confirmed that 100% of the validation counts have a GEH within acceptable criteria. This shows that the model fully meets the requirements of the NRA PAG's, which implies that an acceptable level of fit can be assumed for GEH of less than 5 in at least 85% of traffic sites.

The validation of the 2012 LAM base model has demonstrated that the level of fit between modelled and observed data is good.

The validated model was checked for logical traffic distribution patterns by using trip length distributions and 'select link analysis'. Route choices within the model were also checked to make sure logical routes were being used.

Further, as part of the validation process, modelled journey times were compared against the measured journey times to ensure accurate representation of existing conditions.

It was observed that the model also calibrates very well to journey times, meeting the NRA PAG requirement that 85% of all modelled journey times are within 15% of observed data or less than 60 seconds.

Based on the model validation results it was concluded that the 2012 base year LAM model adequately represented existing traffic patterns and volumes on the road network in Naas and environs, with good representation of 'through' trips including the M7 Motorway.

Therefore it was considered that the model was an appropriate tool for adequately representing expected route choice and traffic behaviour when testing the traffic impacts of both the M7 Naas to Newbridge By-Pass Upgrade Scheme and the proposed M7 Osberstown Interchange and R407 Sallins Bypass Scheme.

#### 5.4.3.2 LAM Model Refinement and Traffic Growth Forecasts

The traffic growth rates included in the LAM model were initially derived from the NRA's NTM. The NTM was developed based on the requirements set out in the NRA '*PAG Unit 5.4 Zone-Based Traffic Growth Forecasting*', with traffic growth applied to the NTM model zones for Naas and environs as indicated in **Figure 5.3 V3**.

As can be seen from **Figure 5.3 V3**, the NTM's zoning was considered too coarse to accurately reflect the land-use and road network at a detailed level within the LAM. In order to refine the LAM for more detailed assessment of traffic impacts associated with the proposed new road infrastructure schemes, the NTM Zones were sub-divided within the LAM as discussed below.

The NRA NTM is made of 874 zones, which cover the entire state. Each zone contains demographic data (population, employment and car ownership) for the base year of 2006 and forecast years of 2025 and 2040. The LAM for the M7 is made up of 9 NTM zones (as shown in **Figure 5.3 V3**), all located in County Kildare, in addition to 15 external zones representing the primary roadways entering the LAM. The existing NTM zones within the LAM were disaggregated (sub-divided) to assist in identifying and representing future growth areas within the Naas and Sallins hinterland. **Figure 5.4 V3** illustrates the disaggregation of zones within the Naas and Sallins district.

A review was undertaken to understand the locations within Naas and Sallins districts with the potential to have the highest traffic growth based on the Naas Town Council Development Plan, the Kildare County Council and the Sallins Local Area Plan. Based on this overview, it can be seen that most of the planned future development growth in the Naas and Sallins environs would be focused on LAM zones 50404, 50405, 50406, 50407, 50408, 50411 (Naas North-West Quadrant) and 50416, as illustrated in **Figure 5.4 V3**.

The LAM zones outside the Naas and Sallins areas would have a more moderate level of growth, concentrated in zones 50401, 50403 and 50412. Minimal growth is assumed for zones 50402, 50409, 50410, 50413 50414 and 50415.

The future year traffic forecasts for the NTM are based on demographic and economic projections which have been prepared at a zonal level.

Demographic data is available for three future year growth scenarios, namely Low, Medium and High. The NTM provides the demand data for light and heavy vehicles for three time periods:

- AM Peak Hour (08:00 – 09:00).
- Average Inter Peak Hour (12:00 – 14:00).
- PM Peak Hour (17:00 – 18:00).

The 'medium growth' projections are consistent with aggregate forecasts prepared by the Central Statistics Office scenario M0F1 which assumes zero net-migration. High and Low growth projections represent upper and lower bounds on anticipated growth over the same period. The M2F1 population projection issued by the CSO has been adopted as the High growth scenario. The Low Population Projections for the NTM has been developed utilising their 'Population Forecasting Model'. The fertility and mortality assumptions utilised in the low projection were the same as those employed by the CSO in the Medium projection.

However, the low projection incorporates significant out migration in the short term before moderating to lower levels in the long term to 2025.

A trip generation exercise was conducted to ascertain the potential volume of trips likely to be generated from all of the zoned lands located within Naas and Sallins environs and to validate the growth predictions used within the LAM as derived from the NRA's NTM.

The findings of this exercise is presented in Table 5.2 below, and compared to the total traffic generation included in the NRA NTM for a both the 2030 'medium' and 'high' growth scenarios.

**Table 5.2: 2030 Traffic generation scenarios for Naas and Sallins (NTM Zone 504)**

| Model | AM Peak | Inter Peak | PM Peak |
|---|---|---|---|
| **Derived from Development Plan land use zoning** | 4,612 | 3,176 | 4,254 |
| ***NRA NTM Naas & Environs Zones (Medium Growth)*** | 2,826 | 1,513 | 3,033 |
| ***NRA NTM Naas & Environs Zones (High Growth)*** | 4,189 | 3,099 | 4,339 |

As can be seen, the assessment of future additional traffic generation from the zoned development lands within the LAM confirms that the 'full build' out of these lands correlates with the corresponding 'high growth' traffic forecasts contained within the Naas and environs zones in the NRA's NTM.

For the purposes of the traffic and environmental impact assessment however, it was agreed with KCC that the NTM 'medium growth' scenario would be used within the LAM, reflecting a more cautious approach to the future rate of development growth. The LAM was also run with the NRA NTM 'high growth' forecasts as a sensitivity test, to robustly assess the capacity of the proposed scheme to ultimately cater for the full build out of all committed Development Plan zoned land-uses beyond the 2030 Scheme Design Year.

#### 5.4.3.3 2012 LAM Road Network

The 2012 LAM network is illustrated in **Figure 5.1 V3** and incorporated the Do-Minimum road network assumptions set out in Section 5.3.2.2.

## 5.5 Transportation Operational Assessment

### 5.5.1 Assessment Scenarios

The validated 2012 base year LAM has been developed and used to forecast traffic impacts for the proposed scheme assessment scenarios set out below:

- 2015: Opening Year:
  - Do Minimum (DM) (This scenario incorporates the M7 Naas to Newbridge By-Pass Upgrade Scheme).
  - Do Something (DS) - DM Plus the M7 Interchange and R407 Sallins Bypass.
- 2030: Design Year:
  - Do Minimum (DM) (This scenario incorporates the M7 Naas to Newbridge By-Pass Upgrade Scheme).
  - Do Something (DS) – DM Plus the M7 Interchange and R407 Sallins Bypass.

The above listed Do-Something scenarios are referenced as DS2 in **Appendix A5.1 V4**.

### 5.5.2 Traffic Growth Forecasts

The traffic growth forecasts included within the LAM, as discussed in Section 5.4.3.2, includes both general background road network traffic growth and specific growth associated with the planned development of zoned lands within the LAM.

Table 5.3 below presents the total peak hour traffic network trips for the respective LAM Low/Medium/High growth scenarios.

**Table 5.3: Total peak hour traffic growth in the LAM (vehicles) – 2012-2015-2030**

| Peak Hour | 2012 | 2015 | 2030 | Increase between 2012-2015 *(in %)* | Increase between 2012-2030 *(in %)* |
|---|---|---|---|---|---|
| ***Low Growth*** | | | | | |
| AM | 21,171 | 21,891 | 25,643 | 720 (3.40 %) | 4,472 (21.12%) |
| PM | 21,305 | 22,036 | 25,861 | 731 (3.43 %) | 4,556 (21.38%) |
| ***Medium Growth*** | | | | | |
| AM | 21,171 | 22,042 | 26,473 | 871 (4.11%) | 5,302 (25.04%) |
| PM | 21,305 | 22,187 | 26,687 | 883 (4.14%) | 5,383 (25.26%) |
| ***High Growth*** | | | | | |
| AM | 21,171 | 22,628 | 30,132 | 1,456 (6.88%) | 8,961 (42.33%) |

All references to traffic forecasts in subsequent sections relate to the 'medium growth' scenario only.

### 5.5.3 Road Network Assessment

The assessment of the traffic impacts of the proposed scheme has been based on the comparison of the AADT on the road network for DM and DS2 scenarios for the assessment years. Table 5.4 presents AADT forecasts, in vehicles for selected road links within the LAM.

The AM, PM and Inter Peak (IP) Period flows were converted to AADT values using the following formula:

***AADT = (3.2 * AM Peak) + (6.5 * IP) + (3.2 *PM Peak)***

For details regarding the derivation of the AADT formula, please refer to the traffic modelling report, included in **Appendix A5.1 V4.**

Link numbers and locations referenced in the Table 5.4 below are presented in **Figure 5.5 V3**.

**Table 5.4: Modelled Annual Average Daily Traffic (AADT) (in vehicles)**

| Road Links | | 2012 Base Year | 2015_DM | 2015_DS | 2030_DM | 2030_DS |
|---|---|---|---|---|---|---|
| **Western Distributor Link Road / Monread Road** | | | | | | |
| 1 | West Of Monread Roundabout | 15,550 | 18,350 | 11,200 | 21,450 | 11,700 |
| 2 | East Of Airside Business Park | 13,250 | 14,250 | 10,300 | 17,850 | 11,050 |
| 3 | East Of Sallins Road (R407) Roundabout | 16,100 | 16,550 | 13,150 | 19,400 | 14,200 |
| 4 | West Of Sallins Road (R407) Roundabout | 11,400 | 12,650 | 9,300 | 17,700 | 11,500 |

| Road Links | | 2012 Base Year | 2015_DM | 2015_DS | 2030_DM | 2030_DS |
|---|---|---|---|---|---|---|
| 5 | East Of Proposed M7 Osberstown Interchange Link | 10,900 | 12,150 | 10,000 | 16,250 | 13,200 |
| 6 | West Of Proposed M7 Osberstown Interchange Link | 10,900 | 11,900 | 7,900 | 15,400 | 12,150 |
| 7 | North Of R409 Carragh Road | 11,050 | 11,700 | 7,550 | 15,150 | 11,150 |
| 8 | North Of R445 Newbridge Road | 10,050 | 9,350 | 3,000 | 11,650 | 3,900 |
| **M7/N7** | | | | | | |
| 9 | East Of Johnstown Interchange (Jn 8) | 69,600 | 72,000 | 72,000 | 84,550 | 84,550 |
| 10 | East Of Maudlins Interchange (Jn 9) | 68,600 | 70,900 | 72,800 | 81,750 | 85,050 |
| 11 | East Of Proposed Osberstown Interchange | 56,400 | 58,100 | 62,950 | 67,600 | 75,000 |
| 12 | West Of Proposed Osberstown Interchange | 56,400 | 58,100 | 64,950 | 67,600 | 73,800 |
| 13 | West Of Newhall Interchange (Upgraded) (Jn 10) | 54,950 | 56,500 | 58,200 | 64,350 | 66,500 |
| **R445 Newbridge Road** | | | | | | |
| 14 | East of the Carragh Road | 7,500 | 7,800 | 8,100 | 9,050 | 9,000 |
| 15 | East of the South Ring Road | 6,300 | 6,700 | 7,000 | 8,800 | 8,750 |
| 16 | East Of The Western Distributor Link Road | 13,450 | 13,900 | 14,400 | 16,450 | 16,750 |
| 17 | West Of The B&Q Roundabout | 20,800 | 20,550 | 13,300 | 23,600 | 16,150 |
| 18 | West Of The Bundle of Sticks Junction | 17,000 | 21,950 | 13,950 | 25,350 | 19,800 |
| 19 | West Of Newhall Interchange (Northern Roundabout) | 17,000 | 20,250 | 19,900 | 22,300 | 22,450 |
| **R409 Carragh Road** | | | | | | |

| Road Links | | 2012 Base Year | 2015_DM | 2015_DS | 2030_DM | 2030_DS |
|---|---|---|---|---|---|---|
| 20 | West Of Western Distributor Link Road | 6,450 | 6,950 | 7,000 | 8,800 | 8,450 |
| 21 | East Of Western Distributor Link Road | 7,550 | 8,400 | 8,800 | 12,450 | 13,100 |
| **Southern Ring Road** | | | | | | |
| 22 | South Of R445 Newbridge Road | 8,850 | 9,850 | 10,150 | 13,300 | 13,250 |
| **R445 Dublin Road** | | | | | | |
| 23 | East Of Monread Road Roundabout | 13,000 | 14,050 | 11,750 | 17,050 | 13,200 |
| 24 | South Of Monread Road Roundabout | 15,650 | 14,600 | 13,600 | 16,950 | 15,250 |
| 25 | North Of R410 Blessington Road | 11,000 | 11,600 | 11,250 | 13,200 | 12,750 |
| **Canal Bank** | | | | | | |
| 26 | North Of Mill Lane (or South of Osberstown Road) | 1,050 | 2,000 | 1,550 | 3,100 | 3,000 |
| 27 | South Of Mill Lane | 1,050 | 2,100 | 1,550 | 3,050 | 3,000 |
| **Mill Lane** | | | | | | |
| 28 | West Of R407 Sallins Road | 3,150 | 3,050 | 3,200 | 3,700 | 3,800 |
| **R407 Sallins Road / R407 Clane Road** | | | | | | |
| 29 | North Of Proposed Sallins Bypass Junction (Clane Road Roundabout) | 18,700 | 19,250 | 20,150 | 22,300 | 23,100 |
| 30 | North Of Proposed Sallins Link Road Junction | 17,700 | 18,200 | 10,750 | 21,350 | 11,800 |
| 31 | North Of Osberstown Road Junction | 18,600 | 19,100 | 12,550 | 22,000 | 13,750 |
| 32 | North Of Monread Road Roundabout | 18,000 | 17,650 | 12,050 | 19,200 | 12,350 |
| 33 | South Of Monread Road Roundabout | 11,700 | 11,050 | 12,500 | 12,400 | 14,200 |
| 34 | North Of Main Street | 12,500 | 12,050 | 11,500 | 13,550 | 13,000 |
| **Main Street** | | | | | | |

| Road Links | | 2012 Base Year | 2015_DM | 2015_DS | 2030_DM | 2030_DS |
|---|---|---|---|---|---|---|
| 35 | North Of Popular Square | 9,450 | 10,650 | 10,450 | 12,750 | 12,450 |
| 36 | South Of Popular Square | 15,500 | 16,550 | 15,550 | 18,550 | 18,000 |
| **Osberstown Road/Cottages** | | | | | | |
| 37 | West Of R407 Sallins Road | 3,450 | 3,950 | 3,000 | 6,150 | 4,750 |
| 38 | West Of Canal Bank Junction | 2,600 | 2,250 | 1,750 | 3,700 | 2,350 |
| **Proposed R407 Sallins Bypass** | | | | | | |
| 39 | North Of Proposed M7 Interchange | N/A | N/A | 9,700 | N/A | 11,650 |
| 40 | North Of Proposed Sallins Link Road Junction | N/A | N/A | 8,600 | N/A | 10,450 |
| **Proposed Sallins Link Road** | | | | | | |
| 41 | East Of Proposed Sallins Bypass | N/A | N/A | 1,150 | N/A | 1,450 |
| 42 | West Of R407 Sallins Road Junction | N/A | N/A | 1,100 | N/A | 1,200 |
| **Newhall Cross Road** | | | | | | |
| 43 | Newhall Cross Road | 6,600 | 4,750 | 4,350 | 5,550 | 5,600 |
| **Kerdiffstown Road** | | | | | | |
| 44 | Kerdiffstown Road | 2,100 | 2,300 | 600 | 3,500 | 1,250 |
| **Osberstown Interchange Link Road** | | | | | | |
| 45 | Link Road | N/A | N/A | 15,500 | N/A | 21,950 |

The road network traffic forecasts presented in Table 5.4 indicate that the introduction of the proposed scheme will have significant benefits in terms of reducing traffic volumes and releasing traffic capacity on key sections of the regional and local road network. This is particularly evident in terms of traffic reductions on a number of key radial and orbital routes, most notably the R445 to the east and west of Naas town centre, congested sections of the Monread Road between the R407 Sallins Road and sections of the Western Distributor Road to the west of the proposed new interchange location.

The R407 Sallins Bypass and its connection to the M7 via the proposed new interchange will provide immediate traffic relief to Sallins Main Street, effectively removing regional orbital 'through traffic', including HGV's (e.g. a 46% reduction in HGV's is predicted in the 2015 DS scenario) accessing the motorway.

This traffic currently has to access the M7 via the Western Distributor Road and Newhall Interchange to the south or via Monread Road and Maudlins Interchange to the north. The Monread Road, which is characterised as a local distributor road with multiple commercial and residential access and road junctions, experiences significant peak time congestion associated due to high volume or regional traffic on this route.

The reductions in 'through traffic' from Sallins Main Street will present an opportunity for greater ease of movement for local traffic. It will also facilitate a focus on sustainable transport policies for shorter commutes within Sallins and connecting to Naas, including the development of safer, more pleasant cyclist and pedestrian routes.

With respect to the National Road network, the proposed scheme will also benefit the adjacent M7 interchange at Maudlins and Newhall in terms of further improved operational performance.

In summary, the proposed scheme will have a net positive traffic impact on the local road network in terms of reducing traffic volumes, releasing capacity for local trips and public transport services and, where appropriate, the reallocation of road space for enhanced cycle and pedestrian infrastructure.

#### 5.5.3.1 Impact on M7 Traffic Levels

The predicted AADT and peak hour traffic levels along the sections of the M7 approaching the proposed M7 Osberstown interchange for the scheme assessment scenarios are presented in Table 5.5 and 5.6.

**Table 5.5: AADT M7 Traffic Volumes (in vehicles)**

| AADT | 2015_DM | 2015_DS | 2030_DM | 2030_DS |
|---|---|---|---|---|
| M7 EB West of Interchange | 29,200 | 32,350 | 33,950 | 37,350 |
| M7 WB West of Interchange | 28,900 | 32,600 | 33,650 | 36,450 |
| **Two-Way Total (West of Interchange)** | **58,100** | **64,950** | **67,600** | **73,800** |
| M7 EB East of Interchange | 29,200 | 32,150 | 33,950 | 38,300 |
| M7 WB East of Interchange | 28,900 | 30,800 | 33,650 | 36,700 |
| **Two-Way Total (East Interchange)** | **58,100** | **62,950** | **67,600** | **75,000** |

**Table 5.6: Peak Hour M7 Traffic Volumes (in vehicles)**

| Peak hour Flows | 2015_DM | 2015_DS | 2030_DM | 2030_DS |
|---|---|---|---|---|
| **AM Peak** | | | | |
| M7 EB West of Interchange | 3,600 | 3,800 | 4,300 | 4,550 |
| M7 WB West of Interchange | 2,150 | 2,550 | 2,500 | 2,850 |
| **Two-Way Total (West of Interchange)** | **5,750** | **6,350** | **6,800** | **7,400** |
| M7 EB East of Interchange | 3,600 | 3,950 | 4,300 | 4,650 |
| M7 WB East of Interchange | 2,150 | 2,250 | 2,500 | 2,700 |
| **Two-Way Total (East Interchange)** | **5,750** | **6,200** | **6,800** | **7,350** |
| **PM Peak** | | | | |
| M7 EB West of Interchange | 2,150 | 2,450 | 2,450 | 2,850 |
| M7 WB West of Interchange | 3,950 | 4,100 | 4,650 | 4,550 |
| **Two-Way Total (West of Interchange)** | **6,100** | **6,550** | **7,100** | **7,400** |
| M7 EB East of Interchange | 2,150 | 2,350 | 2,450 | 2,750 |
| M7 WB East of Interchange | 3,950 | 4,100 | 4,650 | 4,800 |
| **Two-Way Total (East Interchange)** | **6,100** | **6,450** | **7,100** | **7,550** |

Tables 5.5 and 5.6 illustrate that the proposed scheme results in a relatively small increase in traffic demand on the M7 mainline. This is to be expected as the interchange and bypass offers regional traffic a more direct route to the Naas North–West Quadrant and the R407 Clane Road. This also reinforces the objective of the proposed scheme where regional traffic is able to stay on the motorway for a longer part of their journey and therefore have less impact on the local road network.

The proposed upgrading of the M7 in advance of the proposed scheme ensures that any M7 mainline impacts associated with the traffic increases on approach to the proposed interchange will be catered for.

### 5.5.3.2 Impacts on Journey Times

The impact of the proposed scheme on the local and regional road network is positive in terms of improved travel times corresponding with a reduction in the levels of congestion between the DM and DS scenarios as discussed earlier in Section 5.5.3.

The proposed scheme will, in particular, have significant benefits in relieving traffic congestion along a number of existing busy local traffic corridors such as the R407 Sallins Road, Monread Road and the Western Distributor Road.

Table 5.7 and 5.8 below provides an indication of journey time and speed improvements respectively for selected routes as a result of the introduction of the proposed scheme for the 2030 AM and PM Peak Periods.

**Table 5.7: Journey Time Comparisons**

| Road network route between; | DS v DM journey time saving (% reduction) | |
|---|---|---|
| | 2030 AM Peak | 2030 PM Peak |
| M7 West of Newhall Interchange (Upgraded) and R407 Sallins Town Centre | 38% | 37% |
| M7 West of Newhall Interchange (Upgraded) and R407 North of Sallins Bypass | 50% | 49% |
| M7 West of Newhall Interchange (Upgraded) and Naas Town Centre (Via Western Dist. Road) | 26% | 24% |
| M7 West of Newhall Interchange (Upgraded) and Naas Town Centre (Via R 445 Newbridge Road) | 2% | 3% |
| M7 East of Johnstown Interchange and Naas NWQ Western Distributor Road | 40% | 41% |
| M7 East of Johnstown Interchange and R407 North of Sallins Bypass | 41% | 39% |
| Monread Road Roundabout and R407 Sallins Road Roundabout (Along Monread Road) | 22% | 23% |
| R407 North of Sallins Bypass Junction (Clane Road Roundabout) and Naas Town Centre (Junction of R407 with Main Street) | 12% | 16% |
| B&Q Roundabout and R407 Sallins Road Roundabout (along Western Distributor Road) | 14% | 11% |

**Table 5.8: Journey Speed Comparisons**

| Road network route between | DS v DM Journey Speed Improvement (% increase) | |
|---|---|---|
| | 2030 AM Peak | 2030 PM Peak |
| M7 West of Newhall Interchange (Upgraded) and R407 Sallins Town Centre | 64% | 62% |
| M7 West of Newhall Interchange (Upgraded) and R407 North of Sallins Bypass | 94% | 88% |
| M7 West of Newhall Interchange (Upgraded) and Naas Town Centre (Via Western Dist. Road) | 39% | 35% |
| M7 West of Newhall Interchange (Upgraded) and Naas Town Centre (Via R 445 Newbridge Road) | 33% | 34% |
| M7 East of Johnstown Interchange and Naas NWQ Western Distributor Road | 61% | 63% |
| M7 East of Johnstown Interchange and R407 North of Sallins Bypass | 105% | 98% |
| Monread Road Roundabout and R407 Sallins Road Roundabout (Along Monread Road) | 29% | 29% |
| R407 North of Sallins Bypass Junction (Clane Road Roundabout) and Naas Town Centre (Junction of R407 with Main Street) | 27% | 19% |
| B&Q Roundabout and R407 Sallins Road Roundabout (along Western Distributor Road) | 16% | 12% |

### 5.5.4 Assessment of M7 Osberstown Interchange Operational Performance

In order to assess the operational performance and traffic impact of the proposed M7 Osberstown Interchange, micro-simulation modelling was carried out using 'VISSIM' traffic modelling software.

The micro-simulation modelling assists in the design process by visually assessing the movement of traffic through the interchange. It has also been used as a tool to assist in the scheme options assessment (see Section 3.3.4.2) to confirm scheme layout and design assumptions.

For the purposes of assessment, predicted traffic flows from the LAM assessment years have been run through the micro-simulation model. The model output looks at the level of queuing and congestion at the interchange for each scenario tested.

'Screen snapshots' from the model (2030 DS AM & PM) illustrating the maximum levels of queuing observed is presented in **Figure 5.6 V3** and **5.7 V3**. The average maximum queues as measured from the approaches to the interchange north and south of the roundabout using a 5 minute interval during the simulation, are presented in Table 5.9 below.

**Table 5.9: M7 Osberstown Interchange 2030 DS Average maximum queues (in vehicles) and delays (in sec)**

| Description of Arm/Approach | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|
| | Avg. delay per veh (in sec) | Avg. of max. queue (in PCU) | LOS | Avg. delay per veh (in sec) | Avg. of max. queue (in PCU) | LOS |
| M7 eastbound off slip, at northern roundabout Approach | 3.60 | 1 | A | 2.40 | 0 | A |
| R407 Sallins bypass southbound, at northern roundabout approach | 13.10 | 4 | B | 5.80 | 2 | A |
| M7 westbound off slip, at southern roundabout approach | 2.1 | <1 | A | 3.5 | 1 | A |
| Western Distributor Link Road, at southern roundabout approach | 3.0 | 3 | A | 1.6 | 2 | A |

The analysis indicates that sufficient capacity will be available at the roundabout approaches and slip lane merges to cater for the projected traffic flows and that there will not be any impact to 'through traffic' on the M7 mainline motorway.

### 5.5.5 Assessment of Scheme Junctions Operational Performance

The operational performance of each of the junctions on the proposed scheme has been assessed. Roundabout junction performance was assessed using the UK Department of Transport, Local Government and The Regions (DTLR) ARCADY 6 (Assessment of Roundabout CApacity and DelaY) model software. Signal controlled junctions have been assessed using LINSIG 3 model software developed by JCT consultancy.

These software applications determine the capacity of a junction based on a variety of geometric parameters and assess the extent to which traffic-flow through the junction approaches capacity. The results of the detailed junction analysis are included in **Appendix A5.2 V4**.

The outputs from the assessments are the degree of saturation, reported as a ratio of flow to capacity (RFC), and a mean queue value for each junction arm. The RFC value indicates the extent to which traffic flows on a junction arm approach capacity (a junction arm operating at capacity would have a RFC value of 1.0). Typically a junction is said to be operating satisfactorily if all arms of the junction operate with RFC values below 0.85.

#### 5.5.5.1 L3012 Western Distributor Road / Distributor Link Road Roundabout

The capacity assessment of the proposed roundabout at the junction of the Western Distributor Road with the Distributor Link Road is presented in Table 5.10 for the 2030 DS scenario.

**Table 5.10: 2030 Western Distributor Road/ M7 Osberstown Interchange Link Road Roundabout Performance (DS)**

| Scenario | Junction Arm | 2030 AM Peak | | 2030 PM Peak | |
|---|---|---|---|---|---|
| | | Capacity (RFC) | Queue (vehs) | Capacity (RFC) | Queue (vehs) |
| **DS** | Western Distributor (East) | 0.46 | <1 | 0.46 | <1 |
| | Unnamed Road ( Future Link) | 0.14 | <1 | 0.17 | <1 |
| | Western Distributor (West) | 0.21 | <1 | 0.10 | <1 |
| | M7 Interchange Link | 0.27 | <1 | 0.43 | <1 |

From the above assessment, it can be seen that the roundabout is expected to have sufficient capacity to accommodate the projected traffic levels associated with the proposed scheme.

#### 5.5.5.2 Proposed R407 Sallins Bypass / R407 Clane Road Roundabout

The capacity assessment of the proposed roundabout at the junction of the proposed R407 Sallins Bypass and the existing R407 Clane Road, north of Sallins Town is presented in Table 5.11 for 2030 DS.

**Table 5.11: 2030 Proposed R407 Sallins Bypass/R407 Clane Road Roundabout Performance (DS)**

| Scenario | Junction Arm | 2030 AM Peak | | 2030 PM Peak | |
|---|---|---|---|---|---|
| | | Capacity (RFC) | Queue (vehs) | Capacity (RFC) | Queue (vehs) |
| DS | Clane Road Northern Approach | 0.76 | 3.1 | 0.70 | 2.3 |
| | Clane Road Southern Approach | 0.62 | 1.6 | 0.61 | 1.5 |
| | Sallins Bypass | 0.44 | <1 | 0.39 | <1 |

From the above assessment, it can be seen that the roundaboutis expected to have sufficient capacity to accommodate the projected traffic levels associated with the proposed scheme.

### 5.5.5.3 Proposed Sallins Link Road (Millbank Road) / R407 Sallins Road (Main Street) Junction

The proposed Sallins Link Road will connect the bypass with the Main Street in Sallins at the location of an existing signal controlled junction at Millbank Road (see **Figure 1.2 V3**). The capacity assessment for this junction is presented in Table 5.12, comparing the 2030 DM and DS scenarios.

**Table 5.12: Sallins Link Road (Millbank Road)/R407 Sallins Road (Main Street) signalised Junction Performance**

| Scenario | Junction Arm | Movements | 2030 AM Peak | | 2030 PM Peak | |
|---|---|---|---|---|---|---|
| | | | Degree of Saturation | Queue (PCU) | Degree of Saturation | Queue (PCU) |
| DM | R407 Clane Road (North) | Right/Straight | 0.83 | 27.6 | 0.64 | 16.6 |
| | R407 Sallins Road (South) | Left/Straight | 0.62 | 16.2 | 0.73 | 21.6 |
| | Sallins Link Road (West) | Left/ Right | 0.65 | 3.4 | 0.75 | 4.9 |
| DS | R407 Clane Road (North) | Right/Straight | 0.48 | 10.0 | 0.33 | 5.7 |
| | R407 Sallins Road (South) | Left/Straight | 0.33 | 6.5 | 0.55 | 12.9 |
| | Sallins Link Road (West) | Left/ Right | 0.60 | 3.5 | 0.67 | 7.2 |

The DM assessment indicates that the junction will operate close to capacity level due to the anticipated traffic growth along Sallins Road in the absence of the proposed R407 Sallins Bypass. The proposed scheme will reduce traffic volumes significantly along Sallins Road (Main Street), which in turn will release capacity at the Sallins Link Road approach to the junction to cater for any projected increase in traffic levels to and from the Sallins Link Road.

From the above assessment, it can be seen that in overall terms the performance of the junction will improve with the introduction of the proposed scheme.

#### 5.5.5.4 Proposed R407 Sallins Bypass/Sallins Link Road Roundabout

The capacity assessment of the proposed roundabout at the junction of proposed R407 Sallins Bypass and Sallins Link Road is presented in Table 5.13 for 2030 DS.

**Table 5.13: 2030 Proposed R407 Sallins Bypass/R407 Clane Road Roundabout Performance (DS)**

| Scenario | Junction Arm | 2030 AM Peak | | 2030 PM Peak | |
|---|---|---|---|---|---|
| | | Capacity (RFC) | Queue (vehs) | Capacity (RFC) | Queue (vehs) |
| **DS** | Sallins Bypass Northern Approach | 0.32 | <1 | 0.32 | <1 |
| | Sallins Link Road | 0.08 | <1 | 0.08 | <1 |
| | Sallins Bypass Southern Approach | 0.24 | <1 | 0.21 | <1 |

From the above assessment, it can be seen that the roundabout is expected to have sufficient capacity to accommodate the projected traffic levels associated with proposed bypass and link road.

#### 5.5.5.5 Impacts on Public Transport

The impacts of the proposed scheme on public transport are considered to be positive in both the short and longer term.

In the short term, the proposed scheme will have a positive impact in terms of reducing traffic volumes on the local and regional road network, thereby improving journey time and its reliability for existing and potential additional future public transport services. This will also facilitate increased accessibility and connectivity with Sallins Train Station.

Longer term, the proposed scheme will enable the strategic public transport objectives of the Local Authorities in terms of facilitating an enhanced PTI and strategic park and ride adjacent to the railway, accessed off the proposed R407 Sallins Bypass.

#### 5.5.5.6 Impacts on Cyclists and Pedestrians

Careful consideration has been given as part of the scheme design to the provision of new cyclist and pedestrian facilities and their integration into the wider existing and future proposed networks.

The proposed scheme has been designed to provide alternative cycle and pedestrian connectivity to the north and south of the M7, removing the need to traverse the proposed M7 Osberstown Interchange.

This is achieved by the proposed connection between the existing cycle and pedestrian route along the Western Distributor Road (Cycle Route N6) and a new connection to the Canal Road (green Way Route K13), which in turn will connect to the R407 Sallins Bypass north of the proposed rail underbridge.

The proposed scheme specifically incorporates an amenity cycle track and footway provision on the Sallins Town side of the Bypass and makes provision for connection to future cycle network and pedestrian routes along the Canal (Cycle Route K10).

In general, the proposed scheme will have a positive impact in terms of enhancing the existing pedestrian and cyclist environment and adding new amenity walking and cycling routes to the area.

Along the local road network the pedestrian and cyclist environment will benefit from the resulting reduction in traffic levels. As discussed later in Section 7.4.2.3.7, the reduction in traffic along Sallins Main Street in particular will provide considerable relief from severance and afford opportunities to enhance existing and provide for new pedestrian and cycle facilities, such as the above referenced N2 Cycle Route.

## 5.6 Transportation Construction Impacts

Construction traffic impacts of the proposed scheme are considered in detail in Section 4.4 of Chapter 4 – *Description of the Proposed Scheme*.

Construction of the proposed scheme will add additional traffic to the local network for the duration of the construction works, as a result of materials supply and disposal, movement of site equipment and travel demand from site workers and visitors.

As a general strategy, construction vehicles will be directed away from the local road network and will be required to use designated primary national and regional routes for accessing the site. The primary access to and from the construction site will therefore be via the M7, the 'Western Distributor Road' and the R407 Clane Road.

Use of local roads will only be permitted when no other alternative construction access route options are available.

Existing traffic movements on the local and regional road network will generally not be restricted by the proposed construction works. The proposed scheme will ensure the minimum possible disturbance to local residents and existing traffic.

Night time working will be generally avoided, other than for very specific time restrictive construction activities, such as for bridge works on the M7 and to accommodate railway line closures associated with the proposed railway underbridge construction.

Local access will generally be maintained at all times. Temporary diversions locally and the implementation of traffic management measures, such as one-way shuttle arrangements with temporary traffic signals may however be necessary over short durations.

Existing cyclist and pedestrian movements are to be facilitated throughout the construction period.

There will be a requirement for the contractor to develop a comprehensive Construction Traffic Management Plan, meeting the mitigation measures and environmental measures set out in the EIS and incorporating any specific additional requirements of statutory authorities including Kildare County Council, Naas Town Council, Iarnród Éireann, An Garda Síochána and the NRA.

## 5.7 Mitigation Measures

### 5.7.1 During Operation

A number of specific mitigation measures have been incorporated into the scheme design to ensure that the proposed scheme provides adequate traffic capacity to avoid any local traffic congestion issues arising. No further mitigation measures are required as a part of this scheme.

### 5.7.2 During Construction

As indicated in Section 4.4, construction of the proposed scheme will cause temporary short-term traffic impacts on the local road network. Enforcement of a Construction Management Plan will ensure that construction traffic impacts are minimised through the control of site access / egress routes and site access locations, traffic diversions and any necessary temporary road closure requirements.

## 5.8 Residual Impacts

The opening of the proposed M7 Osberstown Interchange and R407 Sallins Bypass Scheme will see changes to the local, regional and national (M7 Corridor) road network and traffic flows. The modelling work undertaken to assess the traffic impacts of the proposed scheme indicates that there will be an overall significant traffic benefit associated with the proposed scheme. Further, the proposed scheme will provide benefits to existing and new public transport services and walking and cycling routes on the adjoining local and regional road network. In the longer term, the proposed scheme will facilitate regional transport objectives for the establishment of a PTI off the R407 Sallins Bypass adjacent to the Dublin to Cork railway line.

## 5.9 References

NRA, *Project Appraisal Guidelines Unit 5.2: Construction of Traffic Models*.

NRA, *Project Appraisal Guidelines (PAG), Unit 5.5: Link-Based Traffic Growth Forecasting*

NRA, *PAG Unit 5.4 Zone-Based Traffic Growth Forecasting.*

NTA, *Draft Greater Dublin Area' Cycle Network Plan, August 2013*.

Kildare County Council. 2011. *Kildare County Development Plan, 2011-2017*.

Naas Town Council. 2011. *Naas Town Development Plan, 2011-2017*.

Kildare County Council. 2009. *Sallins Local Area Plan 2009*.

Naas Town Council. 2007. *Northwest Quadrant Master Plan*.

Department of the Environment and Local Government (DoELG), Department of Transport (DoT) and the Dublin Transportation Office (DTO), 2003. *Traffic Management Guidelines*. Government Publications, Dublin, Ireland.

M7 Osberstown Interchange, Environmental Impact Assessment, November 2008

Environmental Protection Agency (EPA), *2002. Guidelines on the Information to be Contained in Environmental Impact Statements*.

EPA, 2003. *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*.

NRA, 2007. *Traffic and Transport Assessment Guidelines*.

NRA, 2009. *Design Manual for Roads and Bridges*.

UK Department for Transport, 2007. *Guidance on Transport Assessment*.

UK Highways Agency, 1999. *Design Manual for Roads and Bridges. Traffic Capacity of Urban Roads. TA 79/99*.

UK Highways Agency's, 2009. *Design Manual for Roads and Bridges; (DMRB) Volume 11*.

NTA, *National Cycle Manual- 2011*

Department of Transport, Tourism and Sport and the Department of Environment, Community and Local's Government, *Design Manual for Urban Roads and Streets (DMURS)*

NTA, *-Draft Greater Dublin Area Cycle Network Plan-2013*