O'Callaghan Moran & Associates

McHale Facility,
Ballinrobe, Co. Mayo

Traffic Impact Assessment

July 2013
Revision B

TOBIN CONSULTING ENGINEERS

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REPORT

PROJECT: McHale Facility, Ballinrobe, Co. Mayo
Traffic Impact Assessment

CLIENT: O'Callaghan Moran & Associates,
Environmental & Hydrological Consultants,
Granaty House,
Rutland Street,
Cork.

COMPANY: TOBIN Consulting Engineers
Fairgreen House,
Fairgreen Road,
Galway.

www.tobin.ie
**McHale Facility, Ballinrobe, Co. Mayo**
Traffic Impact Assessment

**DOCUMENT AMENDMENT RECORD**

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<th>O'Callaghan Moran &amp; Associates</th>
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<td>Title:</td>
<td>Traffic Impact Assessment</td>
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<th>DOCUMENT REF: TR01-TIA</th>
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<th>Description &amp; Rationale</th>
<th>Originated/Date</th>
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1 INTRODUCTION

1.1 INTRODUCTION

TOBIN Consulting Engineers Ltd has been appointed by O’Callaghan Moran & Associates to prepare a Traffic Impact Assessment Report for the proposed intensification of the McHale Facility which is an existing manufacturing facility located in Ballinrobe, Co. Mayo.

In preparing this report, TOBIN Consulting Engineers has made reference to

- The Mayo County Development Plan 2008 - 2014;
- NRA ‘Traffic and Transport Assessment Guidelines’;
- NRA DMRB TD 41-42;
- Foras Forbartha - RT180 Geometric Design Guidelines
- NRA Project Appraisal Guidelines Unit 5.5: Link-Based Traffic Growth Forecasting

1.2 OBJECTIVES

The objective of this report is to assess the impact the proposed development will have on the existing road network. This report will calculate the expected volume of traffic that will be generated by the proposed development and assess the impact that this traffic will have on the operational capacity of the road network in the vicinity of the development. The junction to be analysed as part of this report is the existing access junction on the N84.
1.3 STRUCTURE OF THE REPORT

This report is divided into seven chapters:

- Chapter 1 includes this introduction
- Chapter 2 describes the proposed development, and its location.
- Chapter 3 provides an overview of the existing and proposed traffic conditions, explaining how this information was obtained.
- Chapter 4 outlines the assumptions that have been made in the calculation of traffic generated by the development and the factors used to forecast the future road network traffic.
- Chapter 5 explains the methodology used and the results of the analysis performed on the nominated junction. An investigation into link capacity is also dealt with in this chapter.
- Chapter 6 addresses issues relating to road safety, parking provision, pedestrians & cyclists and access for people with disabilities.
- Chapter 7 concludes the report.
2 PROPOSED DEVELOPMENT

2.1 SITE LOCATION

The McHale Manufacturing Facility is located along the N84 Castlebar Road, to the northwest of Ballinrobe. Figure 2.1 below outlines the location of the existing manufacturing facility.

![Site Location Diagram]

2.2 DESCRIPTION OF PROPOSED DEVELOPMENT

It is proposed that the existing manufacturing facility will increase its output by 60% in the next 5 years. With small increases in production predicted thereafter. Staff levels at the facility are expected to increase from the current level of 190 to 300 and this is expected to take place within the next 5 years.

Access to the facility is proposed to continue through the existing priority junction on the N84 Castlebar Road.
2.3 COMMITTED DEVELOPMENT

No major planning applications have recently been granted permission in the vicinity of the development which will significantly affect the operational capacity of the proposed site access junction. As such, it has been assumed that any increase in traffic over the time period considered in this report will be accounted for in background traffic growth factors (discussed further in chapter 4).

There are two recent planning applications on the site of the manufacturing facility both of which were granted on the 6th November 2013. These are as follows:

- P13/337 - Retention of an industrial unit, a rear extension to an industrial unit and a bunded paint store with associated services
- P13/339 - Extension to an existing industrial unit, an extension and alterations to an existing carpark, relocation of standby electrical generator units and a hard surfaced apron with associated services. Permission is also being sought for demolition of a shed.

There is no increase in production associated with these planning applications and as a result, there is no expected increase in traffic generated by their construction.
3 EXISTING AND PROPOSED TRAFFIC CONDITIONS

3.1 TRAFFIC SURVEY

In order to determine the magnitude of the existing traffic flows, the results of a classified junction turning count was used. This traffic survey was carried out by Abacus Transportation Surveys on Wednesday 13th June 2013 between the hours 07:00 and 19:00 on the N84 Castlebar Road / existing Manufacturing Facility priority access junction. This survey distinguished between cars, light good vehicles, buses and heavy good vehicles. The traffic count data is included in Appendix A of this report.

The results of this survey indicated that the peak traffic levels through this junction occurred between the hours of 08:15 and 09:15 and between 17:00 and 18:00.

In order to undertake an analysis of the junction, it was necessary first to convert the raw traffic survey data, which consisted of cars and heavy vehicles, into a common index known as passenger car units (PCU’s). This was undertaken by applying a factor to all surveyed traffic movements to take account of the composition of the different types of vehicle. This factoring calculation assumes 1 car / light vehicle = 1 PCU, 1 heavy vehicle (type OGV1) = 1.5 PCU’s, 1 heavy vehicle (type OGV2) = 2.3 PCU’s and 1 bus = 2 PCU’s in accordance with TRL RR67.

3.2 EXISTING ROAD NETWORK

The existing site entrance is located in a 100km/h speed zone. The N84 has a carriageway width of approximately 7.4m in the vicinity of the site access junction, with 2.5m wide hard shoulders on both sides of the carriageway. No pedestrian facilities or cyclist facilities are currently provided and street lighting is not provided in the vicinity of the site. Road markings in the vicinity of the entrance are clearly visible.

The access road leading into the development is approximately 7m. The entrance leading into the manufacturing facility is sufficiently wide to accommodate the turning movements of larger vehicles, with the width at the mouth of the junction being approximately 27m. Road markings leading into the entrance are visible however, the junction is not clearly marked as a yield or stop junction.

3.3 PROPOSED NETWORK IMPROVEMENTS

It is proposed to provide a ghost island and right turning lane, designed in accordance with the NRA DMRB, at the entrance to accommodate traffic approaching from the north. This should
improve the capacity of the N84 by removing queuing right turning traffic, while also improving road safety conditions by removing the hazards associated with priority junctions on high speed roads. No other infrastructural improvements are currently planned in the immediate vicinity of the site which will have a significant impact on traffic movements in the area.
4 TRIP DISTRIBUTION AND GENERATION

4.1 TRIP GENERATION

The volume of traffic expected to be generated during the AM and PM peak hours for the proposed development was derived from the results of the traffic count carried out at the existing site access junction.

Trip Rates for the development have been determined based on the existing staff numbers and the production at the development. These trip rates for the AM and PM peak hours are shown below in Tables 4.1 and 4.2 respectively. It should be noted that the AM peak flow on the entrance differs from the peak AM flow turning into or out of the entrance with the latter occurring an hour earlier between 7.15 and 8.15am. For robustness, the peak traffic flow turning at the junction has been used to estimate the generate a trip rate for AM traffic.

### Table 4.1: Trip Generation Rate for Development for AM Peak Hour

<table>
<thead>
<tr>
<th>Existing Levels</th>
<th>Arrivals</th>
<th>Arrivals per Unit</th>
<th>Departures per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff</td>
<td>190</td>
<td>99</td>
<td>0.521</td>
</tr>
<tr>
<td>Production</td>
<td>100%</td>
<td>2</td>
<td>0.020</td>
</tr>
</tbody>
</table>

### Table 4.2: Trip Generation Rate for Development for PM Peak Hour

<table>
<thead>
<tr>
<th>Existing Levels</th>
<th>Arrivals</th>
<th>Arrivals per Unit</th>
<th>Departures per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff</td>
<td>190</td>
<td>11</td>
<td>0.058</td>
</tr>
<tr>
<td>Production</td>
<td>100%</td>
<td>6</td>
<td>0.060</td>
</tr>
</tbody>
</table>

Staffing levels are proposed to increase by 110 people, from 190 to 300 which is a 58% increase. Production at the facility is expected to increase by 60% in the first 5 years and then increase by a small amount each year for ten years until 2028. For the purposes of this report, it is assumed that the small amount will be a 5% increase year on year which will result in a further 55% increase over these ten years. The volume of traffic expected to be generated by the development for the proposed additional increased production for the AM and PM peak hours is shown below in Tables 4.3 and 4.4 respectively.
4.2 TRIP DISTRIBUTION

It has been assumed for the purposes of this report that traffic distributions will mirror existing distribution patterns.

The distribution of development-generated traffic for the AM and PM peak hours is shown below in Figures 4.1 and 4.2 respectively.
The traffic generated by the proposed development for the AM and PM peak hours in 2018 and 2028 is shown below in Figures 4.3 – 4.6 (All figures are in PCU's).
4.3 SEASONAL ADJUSTMENT

In order to undertake an analysis of a junction, it may be necessary to apply a correction factor to convert the surveyed PCU values into seasonally adjusted traffic flows to take account of the seasonal variation that is experienced with traffic surveys (i.e. traffic count data). These seasonally adjusted conversion factors were calculated using data taken from a fixed automatic traffic counter located on N60 Balla (NRA counter N60-07) in 2010. Traffic flows in June were found to experience higher than average traffic flows. In order to ensure a robust assessment, no seasonal adjustment factor was applied to the surveyed traffic.

The results of the seasonally-adjusted traffic count for the AM and PM peak hours are shown below in Figures 4.7 and 4.8.
4.4 TRAFFIC GROWTH

The background traffic growth factors used in the analysis in this report were established from the NRA's Project Appraisal Guidelines - Unit 5.5 Link-Based Traffic Growth Forecasting guidance document. In order to ensure a robust assessment of the road network, the high growth scenario for Region 6 was used in the analysis. These resulted in growth factors of:

- 1.115 growth factor from 2013 to 2028 (5 years beyond year of increased production)
- 1.366 growth factor from 2013 to 2028 (15 years beyond year of increased production)

The baseline plus generated traffic (with both committed and proposed development) for the year of opening 2013, 5 years following the productivity increase and the design year 2028 for both the AM and PM peak hours are shown below in Figures 4.9 to 4.14 (All figures are in PCU’s).
Fig 4.10: Baseflow Plus Generated Traffic 2013 PM Peak

Fig 4.11: Baseflow Plus Generated Traffic 2018 AM Peak

Fig 4.12: Baseflow Plus Generated Traffic 2018 PM Peak

Fig 4.13: Baseflow Plus Generated Traffic 2028 AM Peak
Fig 4.14: Baseflow Plus Generated Traffic 2028 PM Peak
5 ROAD IMPACT

5.1 JUNCTION ANALYSIS
5.1.1 Introduction and Methodology

The proposed site access junction has been analysed using the Transport Research Laboratory (TRL) computer program, PICADY, a widely accepted tool used for the analysis of priority junctions.

The performance of the entrance has been analysed for the critical AM and PM peak hours, for the surveyed traffic, expected year of increased production, 2013, 5 years post production increase, 2018, and the design year 2028, 15 years beyond the year of production increase.

The key parameters examined in the results of the analysis are the Ratio of Flow to Capacity Value (RFC value – desirable value should be no greater than 0.85 for PICADY – values over 1.00 indicate the approach arm is over capacity), the maximum queue length on any approach to the junction and the average delay for each vehicle passing through the junction during the modelled period.

PICADY requires the following input data:

- Basic modelling parameters (usually peak hour traffic counts synthesised over a 90 minute model period)
- Geometric parameters (including lane numbers & widths, visibility, storage provision etc)
- Traffic demand data (usually peak hour origin/destination table with composition of heavy goods vehicles input*)

* For the purpose of this report, adjustments for varying vehicle types were made to the traffic figures prior to input. Traffic volumes input into PICADY were in PCU’s and, accordingly, commercial vehicle composition was set to zero and car composition was set to 100% in the input.

The results of the PICADY analysis are presented in section 5.1.3. The origin/destination traffic demand tables for all the different scenarios tested for the analysed junctions are provided in the Appendix B of this report.
5.1.2 Assessment Years

The performance of the junction has been analysed for the critical AM peak hour (08:15 – 09:15) and PM peak hour (17:00 – 18:00). This analysis was carried out for both the expected year of increased production, expected to be 2013, 5 years post increase, 2018, and the design year of the development 2028, 15 years beyond the main production increase in accordance with the NRA "Traffic and Transport Assessment Guidelines".

5.1.3 Analysis Results

A summary of the analysis results for the proposed site access junction for the AM and PM peak hours are provided below in Table 5.1. Full outputs from PICADY are included in Appendix D.

<table>
<thead>
<tr>
<th>Year &amp; Time</th>
<th>Arm A—NB4 to Ballinrobe</th>
<th>Arm B—Development</th>
<th>Arm C—NB4 to Castlabor</th>
<th>Average Delay (min/veh)</th>
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<tr>
<td>Existing AM</td>
<td>-</td>
<td>0.007</td>
<td>0.007</td>
<td>0.01</td>
</tr>
<tr>
<td>Existing PM</td>
<td>-</td>
<td>0.185</td>
<td>0.000</td>
<td>0.23</td>
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<tr>
<td>2018 AM</td>
<td>0.008</td>
<td>0.01</td>
<td>0.007</td>
<td>0.01</td>
</tr>
<tr>
<td>2018 PM</td>
<td>0.214</td>
<td>0.27</td>
<td>0.000</td>
<td>0.00</td>
</tr>
<tr>
<td>2018 AM + Dev</td>
<td>0.018</td>
<td>0.02</td>
<td>0.034</td>
<td>0.04</td>
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<tr>
<td>2016 PM + Dev</td>
<td>0.324</td>
<td>0.48</td>
<td>0.081</td>
<td>0.09</td>
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<tr>
<td>2028 AM</td>
<td>-</td>
<td>0.011</td>
<td>0.009</td>
<td>0.01</td>
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<tr>
<td>2028 PM</td>
<td>-</td>
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<td>0.39</td>
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<tr>
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<td>0.04</td>
</tr>
<tr>
<td>2028 PM + Dev</td>
<td>-</td>
<td>0.409</td>
<td>0.000</td>
<td>0.068</td>
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Table 5.1: PICADY Results: Site Access Junction AM & PM Peak Hours

The above results indicate that the proposed site access junction will operate below the maximum desirable 0.85 RFC up to and including the design year of 2028 with the inclusion of development-generated traffic.
5.2 LINK CAPACITY

The capacity of the N84 has been assessed using the An Foras Forbartha - RT180 Geometric Design Guidelines. For the purposes of this assessment, an average width of 7.5m has been assumed with no obstructions on both sides and lateral clearance of 2.0m and visibility of 60% greater than 460m (the road is generally straight near the entrance). This indicates that the two way capacity of the N84 in the vicinity of the site entrance is approximately 1150 passenger car units (pcu) per hour at Level of Service C. The peak two way flow that is predicted to be present on the N84 occurs during the PM peak in 2028 when 994 cars are predicted to use the road. This suggests that the road will be operating with approximately 14% spare capacity.
6 OTHER ROAD ISSUES

6.1 ROAD SAFETY

Visibility splays of 3.0 x 215 metres is required in accordance with the NRA DMRB TD 41-42. Due to the presence of a stone wall and hedges, this is not achievable without driving onto the hard shoulder of the N84. It is recommended that the entrance is modified such that visibility is available as per the standard outlined above. It is further recommended that stop markings and a stop sign are installed at the junction.

Due to the presence of right turning traffic into the development being forced to wait for gaps on N84, which is a high speed road with a 100km/hr speed limit, it is recommended that a ghost island right turning lane be provided for right turning traffic in accordance with the NRA DMRB. Although the traffic analysis does not predict significant queuing, any queuing on such a road is considered a safety hazard. Condition 11 of the original planning application for the site (planning ref: P98/555) required that the applicant pay a contribution toward the construction of this right turn lane and this was contribution was made.

Accident data made available by the Road Safety Authority on www.rsa.ie has been reviewed and no accident cluster is recorded along the N84 in the vicinity of the entrance.

6.2 PARKING PROVISION

Additional parking will be provided within internally within the site which will accommodate the increased requirements for parking due to the increased staffing levels.

6.3 PEDESTRIANS & CYCLISTS

Due to the nature and rural location of the development, no pedestrian or cyclist facilities are currently provided fronting the site, nor are the provision of such facilities considered appropriate at this stage.

6.4 PUBLIC TRANSPORT

Due to the nature of the development, it is considered that the development will have no impact on public transport in the area, no limited modal shift anticipated from private car to public transport.

6.5 ACCESS FOR PEOPLE WITH DISABILITIES

It is recommended that dished kerbing and tactile paving slabs be installed at all internal crossing points, in accordance with "Guidance On The Use of Tactile Paving Slabs".
7 CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

The conclusions to this report are as follows:

- The proposed site access junction will operate below the desired 0.85 RFC up to and including the design year of 2028, with the inclusion of committed and proposed development-generated traffic.
- The proposed development can be accommodated by the existing road network.
- Due to the rural location, no pedestrian or cyclist facilities are considered appropriate fronting the development.

7.2 RECOMMENDATIONS

This report recommends that:

- Site access junction visibility splays should be increased to provide a 3m x 215m visibility splay for traffic leaving the development and visibility splays should be kept free of all restrictions including signage.
- Stop markings and a stop sign should be installed at the entrance.
- A right-turn lane be provided on the N84 to accommodate traffic travelling from the Castlebar direction.
- Drop kerbing and tactile paving be provided at all internal pedestrian crossing points.
APPENDIX A

Traffic Survey Results