

7 SOCIO-ECONOMICS AND COMMUNITY

7.1 INTRODUCTION

This chapter of the EIS addresses the topics of socio-economics and community and has been prepared by Marston Planning Consultancy. The original report is contained in **Volume 3, Appendix A**.

Human Beings form one of the most important aspects of the environment to be considered. Any likely significant impact on human beings that may be potentially caused by a development proposal must therefore be comprehensively addressed. The principal concern is that human beings experience no significant unacceptable diminution in an aspect, or aspects of “*quality of life*” as a consequence of the construction and operation of the proposed development. Components of “*quality of life*” relevant to this section of the Environmental Impact Statement include community and socio-economic aspects.

The subject site is located in the Electoral Division (ED) of Haggardstown, as defined by the CSO, which defines the site’s hinterland area. In this section, recent demographic trends are examined at State, County and local level. The application site comprises some 44 ha of designated development lands at Mullagharlin and Dundalk, Co. Louth.

7.2 METHODOLOGY

The majority of the data examined in this assessment is based on the 2006 and 2002 Census of Population, the most recent sources of information at an Electoral District level, issued by the Central Statistics Office (CSO). The smallest geographical units distinguished by the CSO are Electoral Divisions (previously called District Electoral Divisions or Wards).

7.3 EXISTING ENVIRONMENT

7.3.1 Population

The population levels within the immediate vicinity of the subject site have fluctuated over the last decade. The Haggardstown ED, within which the proposed development is located, experienced a 19.8% increase in its population between 2002 and 2006 as shown in **Table 7.1**. The Haggardstown ED in the immediate vicinity of the subject site was until recently, characterised by low base levels of population, when compared to other EDs. This is in part due to its previously poor servicing, which has restricted development in the area. However, the recent change in the residential zonings and new housing developments, have led to an increase in population in the area.

Table 7.1 Population change in the State, Louth and Dundalk Town and Environs

	1996	2002	2006	% change 2002-2006
State	3,626,087	3,917,203	4,239,848	+8.2%
Louth	92,166	101,821	111,267	+9.3%
Dundalk Town & Environs	30,195	32,505	35,085	+7.9%
Haggardstown ED		4,894	5,864	+19.8%

Source: CSO Census 1996, 2002 and 2006.

Contrary to the rise in population within the Haggardstown ED, Dundalk Town and Environs had a population growth slightly below that of the State during the same period. However, the overall population of County Louth increased by 9.3% during the last inter-censal period. This was substantially higher than the 8.2% population increase experienced in the State.

The DEDP states that Dundalk has the capability to accommodate a population of 63,000 in the future, and that it has substantial potential for growth on a regional scale, given its location midway between Dublin and Belfast; current levels of growth and planned infrastructure improvements. To accommodate the future growth requirements, approximately 550 hectares have been zoned under the DEDP to accommodate new residential development, within identified growth areas, including the Blackrock area to the east of the subject site. This substantial amount of zoned residential land will offer considerable flexibility in terms of where future growth can be accommodated. The DEDP asserts that this zoned residential land has the capacity to accommodate an increase of some 35,000 population.

It is pertinent to note that in excess of some 2,934 residential units have been granted in the immediate area of the subject site since 2003. When the average household size for the Haggardstown ED (per the 2006 Census) is applied (2.9 persons), provision has been made through the granting of these residential developments, for the accommodation of an additional 8,508 persons within the immediate vicinity of the application site over the next few years.

Dependent Age Cohorts (0-14 and 65+)

The results of the 2006 Census indicate that the percentage of population within the lower age cohorts is in decline while the percentage of population within the older age range is generally static as shown in **Table 7.2**. This is illustrated in that there has been a slight fall from 23% to 22% in the Haggardstown ED for the population in the 0-14 age cohort. Similarly, there has been a slight fall from 23% to 22% in this age cohort for County Louth between 2002 and 2006. Within Dundalk, the same age cohort has declined from 17% to 16% and within the State from 21% to 20% over the same period.

The proportion of the population in the 65+ age group in the Haggardstown ED increased slightly from 10% to 11% over the intercensal period, whilst the proportion of the population in the 65+ age cohort remained static over this period for Dundalk at 11%, for County Louth at 10% and for the State at 11%. Although the proportion of the population in the 65+ age group increased between 2002 and 2006, it remains in line with that of the State.

The percentage of the population within the dependant age groups in the Haggardstown ED (33%) was slightly above that of the State (32%) in 2002. The proportion of the dependent population for Louth and Dundalk stood at 33% and 34% respectively in 2002, and had decreased to 32% and 33% respectively in 2006. The proportion of the State population in the dependent age groups (i.e. 0-14 and 65+) has fallen from 32% to 31% between 2002 and 2006.

Generally, the dependent population within the Haggardstown ED (0-14 and 65+ age groups) corresponds to the State and County figures. It should be noted that the Haggardstown ED has a relatively low population base and its age cohorts may be artificially skewed.

Table 7.2 Age structure of population (%)

Area	0-14	15-24	25-44	45-64	65+	Total
State 2006	20	15	32	22	11	4,239,848
State 2002	21	16	30	21	11	3,917,203
Louth County 2006*	22	14	21	21	10	111,267
Louth County 2002*	23	16	30	21	10	101,821
Dundalk Town 2006	22	16	31	20	11	35,085
Dundalk Town 2002	23	17	29	20	11	32,505
Haggardstown ED 2006	22	13	30	24	11	5,864
Haggardstown ED 2002	23	16	26	25	10	4,894

Source: CSO 2002 & 2006

Working Age Cohorts (15-64)

The proportion of the population in the working age cohort of the Haggardstown ED stood at 67% in 2002, which matched the national average. This figure remained static in the 2006 census, being 2% lower than the national average of 69% in that year. However, an increase was experienced from Dundalk Town where the proportion of the population in the working age cohort increased from 66% to 67% between 2002 and 2006. The percentage of the population of County Louth in the working age cohort stood at 67%, representing a strong working age population in 2002. The proportion of this working age cohort had decreased to 56% in Louth by 2006. The percentage of the population of the State within the working age cohort increased from 67% to 69% between 2002 and 2006.

Household Size

The average household size for the Haggardstown ED was 3.1 in 2002, which dropped to 2.9 in the 2006 Census of Population. Similar decreases have also occurred in Louth from 3.0 to 2.9 and the average household size for the State has fallen from 3.0 to 2.9 between 2002 and 2006. The average household size for the Haggardstown ED and for County Louth as a whole are therefore in line with the National trend.

It is apparent that the study area has a below average proportion of the population within the working and childbearing age groups (between the ages of 15 and 44), an above average proportion of older and retired persons (between the ages of 45 and 65+) and an above average number of dependent persons between the age of 0-14. However, the population dynamic is one of significant growth within the key working age groups, where the demand for suitable employment locations and housing will increase as the population grows.

7.3.2 Employment**ESRI Quarterly Economic Commentary, Spring 2008**

The Economic and Social Research Institute (ESRI), Quarterly Economic Commentary for Spring 2008 summarises the recent economic experience of the State in 2008 as follows:

“It has been evident for some time that 2008 was likely to be a year of slow economic growth. The leading indicators for house building that emerged last year suggested that this sector would contract in 2008. The absence of an SSIA effect also pointed to lower consumption growth in 2008. In the more recent weeks and months, most of the international developments are such that they will have the effect of compounding the difficulties that the economy is facing this year. Among these developments are the appreciation of the euro, the slowing in economic growth in the United States and the on-going difficulties in international financial markets”.

As a result of the above, the ESRI now expects GNP to grow by 1.6 percent this year. This would be the slowest pace of GNP growth since 1988. The downturn in house building is the main reason for the slow pace of growth. However, more recent developments such as the slowdown in the United States and the appreciation of the euro are now adding to the negative set of factors facing the economy in 2008. As a result of the slow pace of growth in 2008, the ESRI now expect no employment growth in 2008, that the unemployment rate will reach 6% and the rate of net inward migration will slow to 20,000 persons. The General Government deficit is expected to reach 1.2 percent on GDP. For 2009, the ESRI expect a modest recovery and foresee GNP growth of 3 percent. The biggest single difference between 2008 and 2009 is expected to be the rate at which house building slows. By 2009, much of the slowdown will have been experienced and house-building will be closer to its long-run sustainable level. Employment growth should resume in 2009 and the ESRI expect to see an extra 24,000 net jobs created. However, the ESRI state that the rate of unemployment will continue to edge upwards.

ESRI Medium Term Review

A view of the health of the economy is indicated in the ESRI Medium Term Review: 2005-2012. The medium term outlook is for the national economy to grow at a slower pace than in recent years but that in spite of the dangers that exist from an uncertain external environment, the Irish economy remains robust.

The Review states that the Irish economy's future lies more in services that are produced using skilled labour rather than in the traditional manufacturing sector. However, this shift in the factors driving growth will not mean that the manufacturing sector is no longer important. On the contrary, the Review deems that it will continue to be a key sector of the economy and its future success will remain very important. Moreover, the Review asserts that *“More than ever, it will be the high technology part of manufacturing that will continue to thrive”*.

From the Census 2006, the proportion of persons engaged in manufacturing employment was at 8.9% in the Haggardstown ED, and 14.9% in County Louth. The proportion of persons engaged in manufacturing employment within the State as a whole was at 12.6%.

This above average percentage for County Louth is representative of the large move towards manufacturing employment in the County overall, compared to the State figure and the need to increase manufacturing employment within the Haggardstown ED itself.

In 2006, the proportion of the total population engaged in professional services in Haggardstown ED was 11%, which was far higher than that of the State at 7%. Also from the Census 2006, Louth had a similarly higher proportion of employed persons engaged in commerce at 13.8%, than the State, at 11.51%, reflecting Louth's role as a prime services location.

Table 7.3 illustrates the trends in Unemployment levels between 2002 and 2006. Unemployment levels have fallen considerably between 2002 and 2006 for the Dundalk, County Louth and the State as a whole, continuing the downward trend from 1991. Unemployment rates fell between 2002 and 2006 from 19% to 13.9% for Dundalk, from 13.2% to 11.3% for Louth County and from 8.8% to 8.1%

for the State. Between 1996 and 2002 the rate of unemployment has fallen by approximately half for the Dundalk, County Louth and the State.

Table 7.3 Unemployment Rates 1996, 2002 & 2006 (%)

	Unemployment Rate 1996	Unemployment Rate 2002	Unemployment Rate 2006
Dundalk & Environs	24.7%	19.1%	17.7%
Louth County*	18.2%	13.2%	11.1%
State	14.8%	8.8%	8.5%

Source CSO, 1996, 2002 & 2006 Census of Population.

*Figures based on population looking for first time employment & population unemployed, having lost or given up previous job, as a percentage of the total labour force.

7.3.2.1 Social Class

The Census of Population, determines social class by the nature of employment, and is therefore useful as a guide to the principal types of occupation in which the population is employed or in which the population is capable of being employed. The entire population is classified as follows:

- Professional workers;
- Managerial and technical;
- Other non-manual;
- Skilled manual;
- Semi-skilled manual;
- Unskilled manual;
- All others gainfully employed;

Social Classes 1, 2 and 3 when combined, include most professionals as well as other non-manual occupations. Social Classes 4 to 7 include primarily skilled, semi-skilled and unskilled manual labour and service employment sectors. The relevant data on social class is detailed in **Table 7.4**.

Table 7.4 Social class composition 2002 and 2006 (%)

Social class	1	2	3	4	5	6	7	1 to 3	4 to 7
State 2002	6	26	16	17	11	6	18	48	52
State 2006	7	26	17	17	11	4	18	50	50
Louth County 2002	5	23	16	19	13	7	17	44	56
Louth County 2006	5	24	18	19	13	5	17	47	53
Haggardstown ED 02	11	35	17	14	8	3	11	63	37
Haggardstown ED 06	11	36	17	14	7	2	13	64	36

Source: Census of Population, 2002 & 2006.

There has been an increase in the Social Classes 1 to 3 for the Haggardstown ED, County Louth and the State between 2002 and 2006, reflecting the gains from the recent economic boom. The number of persons in Social Classes 1 to 3 rose from 63% to 64% within the Haggardstown ED over the intercensal period, from 44% to 47% for County Louth and from 48% to 50% for the State population. The difference between the State increases and the higher rates of Haggardstown ED and County Louth, is reflective of the growing highly skilled and professional population of Louth and, in particular,

the Haggardstown ED. Furthermore, in 2006, only 36% of the population of the Haggardstown ED were within social classes 4-7, compared to 53% and 50% for County Louth and the State respectively in that year.

7.3.3 Community Aspects

7.3.3.1 Receiving environment

The lands are located within Mullagharlin. The site is located close to the M1 and N52 interchange. The general area is currently undergoing significant levels of development. The site is zoned for mixed employment uses. There are two principal elements to the community of this neighbourhood. These can be considered as the resident and working community.

7.3.3.2 Resident community

The population of County Louth and Dundalk and Environs has risen steadily between 2002 and 2006, from 101,821 to 111,267 (9.3%) for County Louth and from 32,505 to 35,085 (7.9%) for Dundalk and Environs. The population of the Haggardstown ED however increased by 19.8% from 4,894 to 5,864 persons during the same time period. There are approximately 60 no. houses which are located around the periphery of the subject site. This represents the resident community already in existence, adjacent to the subject site.

7.3.3.3 Working community

There were 1,929 persons at work in the Haggardstown ED at the time of the 2006 Census of Population. The manufacturing and professional sectors of the working community consist of 36% of the working population. The hinterland has been characterised in the past as having a lower than average levels of unemployment. This is evident from the 2006 Census where just 7.5% of the labour force were classified as unemployed. This is reflective of the high level of employment generating development which has taken place in the general area over recent years.

7.4 POTENTIAL IMPACTS

7.4.1 Construction Phase

7.4.1.1 Population

The construction phase of the proposed development should not have any direct impact on the population of the hinterland of the subject site. It is expected that the work force will travel from existing places of residence to the construction site rather than reside in the immediate environs of the site. The proposed development therefore is not predicted to have any likely and significant impact on population and demography of the area during the construction phase.

7.4.1.2 Employment

The construction phase of the proposed development will take approximately 10 years and will generate construction employment directly on-site, amounting to a maximum of 1,800 persons at any one period during the construction phase of the development. This is likely to benefit suitably qualified members of the local community, as well as others. This will provide an opportunity for a reduction in the local unemployment rate. It will also benefit local support industries such as building suppliers.

7.4.1.3 Community Aspects

The construction phase of the proposed development may result in some temporary nuisances in terms of an increase in daytime noise levels and disturbance due to construction traffic; however it is not considered that the impact will result in any significant adverse impact in respect of community issues. Please refer to the **Chapter 8 Traffic** and **Chapter 10 Noise** of this volume of the EIS for further details.

7.4.2 Operational Phase

7.4.2.1 Population

The 'do-nothing' impact has no effect on the population on the lands at Mullagharlin.

The proposed development will result in a significant increase in the working population of the area. As no residential use is proposed in the instant scheme, there will be no direct increase in population as a result of this proposal. However, there will be a resultant indirect increase in the population as a result of the high quality and extent of employment proposed at this location, mainly comprising of skilled and highly skilled jobs, which are generally deficient in the environs of Dundalk.

Once fully operational it is anticipated that the proposed development will attract more employees into the area and make the area more attractive as a place to live. However, no material change in the population structure of the area is anticipated as a direct result of the development.

The proposed development is not predicted to give rise to any material impacts on the resident population in the site environs due to the fact that the proposal is sited well away from the edge of the site where existing populations are located.

7.4.2.2 Employment

The 'do-nothing' impact is that there would be no increase in employment in the area.

The proposed development will result in an increase in employment opportunities in the area and a significant increase in the working population. It is anticipated that once fully operational that the general improvements proposed in the development, will also attract more employees into the area. In this regard, the development has the potential to generate a significant amount of employment in all elements of the proposal across a wide range of employment categories in addition to technical positions including support services such as administration, building maintenance, cleaning and catering.

The approximate 1850 new jobs that will be directly created at the subject site is considered a significant positive impact. Based on the social class profile of the local community outlined earlier within this chapter, the local population in the hinterland of the subject site are likely to benefit from the new employment, which will be created. This is a significant positive impact.

7.4.2.3 Community

If the proposed development does not proceed (the Do Nothing scenario) there would be no real significant effects on the local workforce. However, there would be potential negative impacts for the commercial well-being and growth as there would be a lower level of economic activity in the area.

A proposal of this nature at the subject lands would have the following potential effects in terms of community issues:

- Increase in economic potential of the area;
- Upgrade the nature of the subject lands from greenfield;
- Increase employment in the area;
- Increase off peak traffic levels in the area; and
- Impact upon existing commercial facilities.

The residential community would experience these impacts in a number of ways. An alteration to the actual physical environment of the neighbourhood will affect the spatial perceptions of the local community, regarding the quality of life in this area. The community will also enjoy new access to an increased range of employment opportunities.

A Science and Technology Park development of this nature would have a significant positive impact on the working population of the area and its hinterland, through the creation of new jobs as described above. The employment uses proposed should ensure that there are high occupancy rates for the Science and Technology Park. The proposed development will result in an enhancement of the resident, working and visitor communities in the area. Overall, the development will result in a positive impact on the local community and its hinterland.

There will be an increase in traffic as a result of the operational phase of the proposal (see **Chapter 8 Traffic**), however its location proximate to existing frequent bus links as well as to the proposed future Railway Station, Park and Ride and Bus Interchange, (which it is an objective of the Mullagharlin Framework Plan to provide to the north of the subject site), will ensure a significant level of public transport options proximate to the subject site on operation, thus enhancing the overall sustainability of the proposal and substantially decreasing potential traffic increases as a result of the proposal.

When the resident, working and visiting communities arising as a consequence of the proposed development are combined with the existing communities of the area, the cumulative impact is likely to be significant and positive in terms of community issues.

7.5 MITIGATION MEASURES

7.5.1 Construction Phase

7.5.1.1 Population

The proposed development will not result in any adverse potential impacts on population during the course of construction apart from that experienced as a result of normal construction activity. No remedial or reductive measures are therefore required apart from normal planning conditions to control dust, construction activity.

7.5.1.2 Employment

No adverse impacts relating to employment are predicted during the construction phase. Therefore no remedial or reductive measures are considered necessary.

7.5.1.3 Community

No mitigation measures are advised regarding community impacts during the construction phase.

7.5.2 Operational Phase

7.5.2.1 Population

No remedial or reductive measures are considered necessary, as the proposed development will not give rise to any adverse impacts on population and demography during the operational phase of the proposed development.

7.5.2.2 Employment

The proposed development will result in the creation of a significant number of new jobs in a wide range of biopharmaceutical activities including primarily highly skilled and skilled services. This is considered a significant positive impact of the proposed development. No remedial or reductive measures are therefore required.

7.5.2.3 Community

The proposed development will be of benefit to the local community due to the overall improvement in the quality and extent of employment facilities. This will result in associated economic and physical environmental improvements, with a significant positive impact for the residential and working communities of the area.

At present the site is a greenfield site and would be in danger of being used for illegal dumping and other anti social activities. The provision of a commercial development such as the proposed Science and Technology Park would ensure that occupancy rates for the site would be high into the future and so no mitigation measures are advised.

7.6 RESIDUAL IMPACTS

As no mitigation measures are advised, residual impacts are the same as those impacts discussed under potential impacts.

7.7 REFERENCES

Reference Details
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8 TRAFFIC

8.1 INTRODUCTION

This chapter of the EIS examines the potential impacts on the local road network arising from the proposed development. Specifically, it considers all the potential transport effects associated with the movement of people to and from the proposed development. A transport assessment has been prepared as part of the planning application submission which contains all the trip rate information that forms the basis of this assessment. The Traffic Impact Assessment has been carried out by RPS.

The assessment follows the approach set out in the *Transport Assessment Guidelines* published in 2007 and the Guidelines published by the Institution of Highways & Transportation in 1994. Material consideration has been taken of the Dundalk and Environs Development Plan 2003 – 2009, of which the Mullagharlin Framework Plan is an adopted variation as of February 2008, and the Dundalk South West Local Area Plan.

The assessment has been prepared on the basis of constructing a mixed use office and industrial development. The proposed industrial usage is for two biotechnology plants with associated bulk storage and warehouses. It is envisaged that the office portion will follow normal businesses practices.

8.2 METHODOLOGY

In order to test the likely impact arising from the development it is necessary to compare the traffic likely to be generated with that of the existing base highway network. RPS Consulting Engineers conducted traffic surveys during April 2008, to assess the existing traffic conditions at strategic points on the local road network. An assessment is carried out for the projected year of opening of the development and then for future years. These future years normally consider the adequacy of the highway network 10 years after opening for existing highway junctions. For any new junctions the network will be examined to test its operation 15 years after opening. In order to predict traffic flows for these years it is necessary to look at traffic trends to obtain the growth in traffic. The National Roads Authority document *Future Traffic Forecasts 2002 – 2040* (August 2003) has been used to calculate traffic growth on the road network for all assessment years. NRA derived growth factors have therefore been applied to the surveyed traffic to obtain future existing traffic, the NRA derived figures have used the Transport Research Laboratory (TRL) method which allows for a growing population as well as an increasing level of car ownership among adults.

TA Guidelines state that cognisance of developments that have been given planning permission but are not yet built should be considered within an assessment of a road network if it is likely that these development will have future impact on this network. Discussions with Louth County Council have indicated that the developments under cover of application numbers 031754 and 061075 should be considered within this assessment. A TIA has been produced for the development of these lands, therefore the approved generated traffic figures have been extracted directly from this document and considered within the committed development in this assessment.

In order to test the proposal it is necessary to predict the level of traffic that is likely to be generated. Trip rates for unrestrained traffic generated by the proposed development have been determined using a recognised database along with the likely number of employees and subsequently, in the absence of sufficient data, total generated traffic has been distributed according to the dominant traffic flows in the immediate area.

It is possible to introduce certain measures as part of good site design to encourage sustainable transport modes. Our assessment therefore examines proposals for enhancing the attractiveness of

public transport, walking and cycling and outlines the restrictions imposed to curtail the use of private cars.

Computer analysis has been carried out to determine the effects of the traffic generated by the proposed development on the surrounding road network. These results have been assessed and determine that the proposed site access junctions will cater adequately for the additional traffic generated by the proposed development.

8.3 EXISTING ENVIRONMENT

The site is located on IDA owned lands at Mullagharlin, Dundalk. The site is to be accessed along the N52 from a newly constructed roundabout between the M1 junction for Dundalk (south) and the junction of the N1/N52/R132.

The N52 is the Southern Link Road between the R132 Dublin Road and the M1 Dundalk Western Bypass, a gateway to Dublin and the North. This route is a dual carriageway along its length, the current temporary speed limit is 50 kph during the construction of highway works in the area; this is set to change to 80 kph upon completion of these works.

The site access takes the form of the Industrial Link Road which is currently under construction and is nearing completion. There are currently two other junctions in addition to the new roundabout, these are signal controlled junctions at the entrance of Xerox and also at Mullagharlin Road, both junctions incorporate left slips to aid traffic flow.

Traffic surveys have been undertaken in the vicinity of the proposed development site during the AM and PM peak hour periods at the junctions detailed in **Table 8.1**. These surveys provide data for the existing traffic flows in the development site area. The survey was carried out as a manual traffic survey between 07:00 – 09:30 and 16:00 – 18:30 to cover the busiest weekday peak periods, figures are recorded in 15 minute intervals. Full details of this survey are included, along with existing traffic flow diagrams, in **Volume 3, Appendix B**.

Table 8.1 Time, Date and Location of Traffic Surveys

Junction / Street Name	Date of count	Peak	Peak Hours
R132/M1/N52	Wednesday 16th April 2008	AM PM	08:15 – 09:15 17:00 – 18:00
Mullagharlin Road/N52	Wednesday 16th April 2008	AM PM	08:15 – 09:15 17:00 – 18:00
N52/N1/R132/Eastern Bypass	Thursday 17th April 2008	AM PM	08:15 – 09:15 17:00 – 18:00
Haynestown Cross/ Mullagharlin Road	Thursday 17th April 2008	AM PM	08:30 – 09:30 17:00 – 18:00

8.3.1 Existing Public Transport Facilities

Public transport in Dundalk consists of bus services run by Bus Eireann and Halpenny Buses as well as train services operated by Iarnrod Eirann. The nearby R132 is the main off-highway route between Dublin and Dundalk and is well served by public transport. Bus Eireann operates four or five return services per day to the surrounding town and villages, as well as a regular service between Dundalk and Belfast/Dublin. Bus stops exist on the N52 within walking distance of the site. Local bus services between nearby Blackrock and Dundalk are available on an hourly to half hourly basis. These services ensure that this important transport corridor is well served by public transport, therefore reducing the need for journeys by private car. In addition, a private company (Matthews Coaches) provides a regular service to and from Dublin on a daily basis.

Regular Irish Rail services are available from Dundalk train station along the Dundalk to Dublin railway line, Enterprise cross border rail services are also available from this location. Dundalk station currently has capacity for 1350 passengers and primarily facilitates commuters between Dundalk, Dublin and Belfast, its close proximity to the town centre makes it an attractive option for those wishing to travel to the Dundalk area.

8.3.2 Existing Cycling Links

Cycling is greatly encouraged in the Dundalk area and is specifically seen as a means to reduce traffic volumes within the Mullagharlin Framework Plan (adopted February 2008).

There are existing partial on-road cycle paths along the R132 Dublin Road. These cycle paths link the Mullagharlin, Crumlin and Haggardstown locales to Dundalk town centre. Where there are no specifically designated cycle paths the safety of cyclists along the R132 Dublin Road is ensured through the provision of wide lanes and a speed limit of 50 kph.

A cycle map extracted from the Dundalk and Environs Development Plan shows all existing cycle routes as well as the desirable routes for future development, this map is included in **Volume 3, Appendix B**.

8.3.3 Existing Pedestrian Facilities

Good pedestrian crossings and linkages are available in the vicinity of the site access, at the newly constructed roundabout. Concrete surface pavements along the both sides of the N52 provide a full pedestrian linkage to the junction at N52/N1/R132. From this location excellent pedestrian facilities are provided into Dundalk town centre.

The new roundabout at the N52 is part of an initial phase of the development of the roads infrastructure throughout the Mullagharlin and adjacent townlands. All new roads throughout this scheme will be designed to accommodate vulnerable road users such as pedestrians, cyclists and the mobility impaired; this is achieved through the provision of dropped kerbs and tactile paving.

8.3.4 Existing Road Network

Apart from the M1, N52 and R132 that are described above, there are a number of rural roads in the area. Mullagharlin Road and Marlbog Road form the west and south site boundaries respectively, they are generally of poor standard, however this proposal will not access directly to either of these roads. Chapel Road, which lies outside of the site boundary to the east of the site, will be incorporated into the committed highway infrastructure development of these lands.

Analysis of traffic volumes in the area has identified considerable capacity at some junctions in the vicinity of the proposed site. Accident data on the existing road network is shown in **Figure 8.1**.

8.3.5 Calculating Base Traffic Flows

Traffic surveys as detailed in **Table 8.1** above have been used to build a picture of the volume of traffic flows at the junctions in the proposed sites vicinity. These are considered to be existing traffic movements.

The National Roads Authority document Future Traffic Forecasts 2002 – 2040 (August 2003) has been used to calculate traffic growth on the road network for all assessment years. NRA derived growth factors have therefore been applied to the surveyed traffic to obtain future existing traffic, the NRA derived figures have used the Transport Research Laboratory (TRL) method which allows for a growing population as well as an increasing level of car ownership among adults.

At this point it should be noted that paragraph 3.7.13 of the IHT guidelines states that: “*Development related activity is an integral part of the national forecasts, and to apply growth based on NRTF to traffic on the surrounding network and then add development traffic may result in some double counting and, therefore, an overestimate of traffic flows.*” As such this process should be considered robust as the NRTF rates have been added as well as known developments.

In preparing base traffic flows it is normal to consider any existing on site approvals and/or any nearby development that has approval but is as yet not constructed. In this case, the traffic generated by the development of lands under cover of applications 031754 and 061075 are considered to impact upon the road network considered within this assessment. The figures in **Table 8.2** show the committed trips that will impact upon the newly constructed roundabout on the N52 Southern Link Road. They are calculated using the methodology used to distribute and assign trips in the aforementioned applications i.e. 75% of traffic approaches from the north, of this traffic it is expected that 25% will use the new roundabout.

Table 8.2 Committed Trips

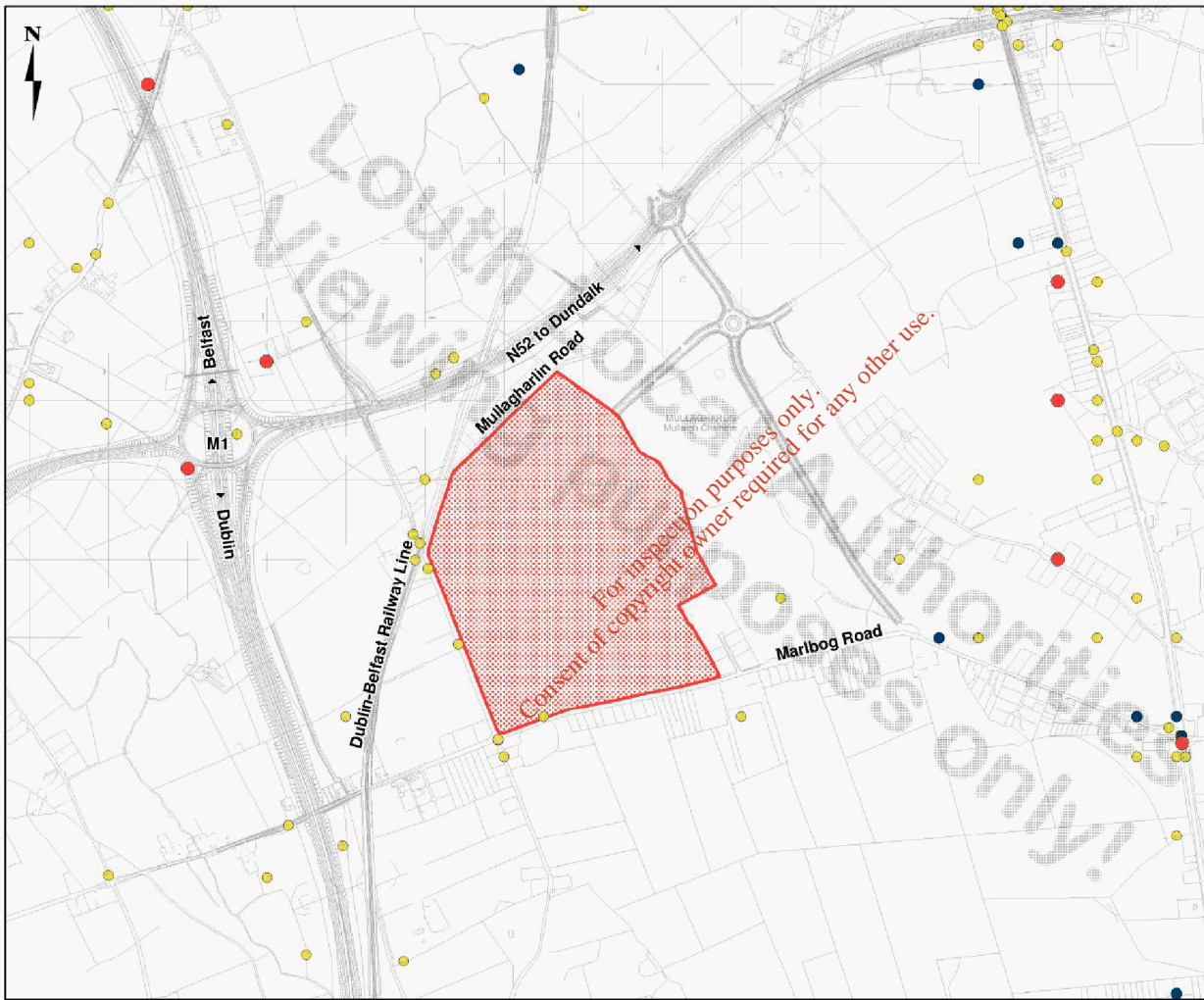
	AM		PM	
	Arr	Dep	Arr	Dep
Residential	27	84	84	27
Commercial	29	17	17	29
Total	56	101	101	56

8.4 POTENTIAL IMPACTS

8.4.1.1 Construction Phase

It is envisaged that the construction of the proposed building will take approximately 12 months, validation, licensing and commissioning of the plant is likely to be carried out over 18 months.

Throughout the construction phase there will be some variation in numbers working on site. The construction manpower peak will be in the order of 1800 people (maximum). Temporary office accommodation and other construction facilities will be installed typically in the western and



Legend

- Site Boundary
- Accidents from 1996 to 2006
Source: NRA and RSA
- Fatal
- Serious
- Minor

IDA IRELAND

Project: IDA Dundalk Science and Technology Park EIS

Title: **Accidents From 1996 to 2006**

Figure: 8.1

RPS

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Issue Details	
Drawn: E.L.	Project No: M0002923
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Date: 06/07/2016	M0028 001

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eastern sections of the site away from residences. The construction site will be segregated by fencing. Normal construction working hours will be observed (08.00 – 20.00 Monday to Friday; 08.00 – 16.00 on Saturday). It may be necessary to work overtime (including at night and weekends) at certain stages. Working outside normal hours may be necessitated through considerations of safety or weather and sub-contractor availability. Heavy or noisy construction activities will be avoided outside normal hours and the amount of work outside normal hours will be strictly controlled.

Although the figure of 1800 people working on site is quite large, it is noted that this is the maximum allowance into which contingency is built. Cognisance must also be taken of the patterns of travel to construction sites by employees, these are usually car/van pools and therefore the actual volume of construction traffic will be greatly less than the volume of traffic once the proposal is fully operational. As the traffic during the sites operation will be less than during construction, it stands that assessment of the operational traffic is the more robust analysis and therefore the activity of construction traffic has not been quantified within this report.

8.4.1.2 Operational Phase

Traffic generation for the proposed development has been assessed using the maximum level of staff that could possibly be employed at the site when fully operational. A trip rate for each land usage has therefore been calculated, this is presented in **Table 8.3**. Using this rather than figures generated from a database will give a realistic representation of the likely impacts that will arise from the proposed development. The shift pattern that has been assumed is detailed in **Table 8.3**.

The assessment considers the elements of the scheme likely to generate traffic during the typical peak times on the road network. The existing peak times are the critical periods on the network and therefore calculations are carried out to determine if capacity exists at these times. During the off peak periods the flows on the network are substantially lower and the addition of any generated traffic would still be below the base figures. Therefore the peak times are used for the purposes of further assessment.

Table 8.3 Shift Patterns

	Start Time	Staff Levels
1050 Persons @ 2/3 shift pattern	08.00 hours	500 morning
	16.00 hours	500 evening
	24.00 hours	50 night

Taking account of the shift patterns it is clear that the peak development hours to be assessed are 07:00 – 08:00 and 16:00 – 17:00. The existing road network peaks at approximately 08:15 – 09:15 and 17:00 – 18:00. During the peak network hours the volume of traffic is substantially greater than during the development peak, therefore the effects of peak spreading become important.

The above staff levels have been subject to a person trip model in order to ascertain proportions of the modal split for the proposal. The TRICS Database v.2008 (a) has been used to calculate the level of vehicle users, pedestrians, and public transport users etc. that are likely to visit the site in each peak hour.

We have assumed that all employees will arrive in the hour preceding the shift start time and will all depart in the hour after the shift ends. Clearly travel to the site will not be made up purely of arrivals or departures for example, therefore the TRICS database is again used to calculate the relative proportions of arrivals to departures, or vice versa depending on the dominant flow of people. These trips and other relevant information are included in **Table 8.4**.

Table 8.4 Trip Rate Calculation

500 staff		Trip Rates				CALCULATED TRIP RATE			
Industrial		0700 - 0800		1600 - 1700		0700 - 0800		1600 - 1700	
GFA	Total Persons	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
100	0.529	0.551	0.264	0.167	0.471	0.529	0.254	0.188	0.529
77260	408.8					409	196	145	409
50 staff		Trip Rates				CALCULATED TRIP RATE			
Office		0700 - 0800		1600 - 1700		0700 - 0800		1600 - 1700	
GFA	Total Persons	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
100	0.526	2.052	0.175	0.264	1.835	0.526	0.045	0.076	0.526
17325	91.2					91	8	13	91

50 staff		Trip Rates				CALCULATED TRIP RATE			
Industrial		0700 - 0800		1600 - 1700		0800 - 0900		2300 - 2400	
GFA	Total Persons	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
100	0.053	0.551	0.264	0.167	0.471	0.019	0.053	0.053	0.025
77260	40.88					14	41	41	20
50 staff		Trip Rates				CALCULATED TRIP RATE			
Office		0700 - 0800		1600 - 1700		0800 - 0900		2300 - 2400	
GFA	Total Persons	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep
100	0.053	2.052	0.175	0.264	1.835	0.008	0.053	0.053	0.004
17325	9.12					1	9	9	1

The calculated trip rates in **Table 8.4** represent total person trips for the individual land uses at the proposed site. **Table 8.5** shows the total person trips to the site during the development peak hours, a factor derived from the TRICS database is used to determine the level of vehicle trips.

Table 8.5 Person and Vehicle Trips during Development Peak

	TOTAL PERSONS		Vehicle Trips	
	Arr	Dep	Arr	Dep
0700 - 0800	500	204	339	141
	Arr	Dep	Arr	Dep
1600 - 1700	158	500	107	347

It is noted from the traffic survey in **Volume 3, Appendix B** that during the network peaks the traffic flows are generally far higher at the surveyed junctions than during the proposed development peak. In some cases the combination of traffic associated with the development peak hour and traffic on the road network does not reach the existing level of traffic on the road network during the network peak hour. TA guidelines would suggest that the busiest hour for the combination of existing network traffic and proposed development traffic should be assessed.

The arrivals and departures during the development peak have been detailed in **Table 8.5**, clearly during the network peak there also be a level of traffic movement in and out of the proposed site. The TRICS database has been used to generate a trip profile for each of the proposed industrial and office land uses. This allows us to predict the level of proposed traffic that will arrive and depart from the site at anytime during the day as a ratio of the traffic during the development peak hours. Traffic levels associated with this proposal during network peak hours are presented in **Table 8.6**.

Table 8.6 Development Traffic Trips during Network Peak Hours

	TOTAL PERSONS		Vehicle Trips	
	Arr	Dep	Arr	Dep
0815 - 0915	292	243	198	168
	Arr	Dep	Arr	Dep
1700 - 1800	91	146	62	101

8.4.1.3 Assignment and Distribution

TA guidelines would, in the absence of relevant local data, advocate the use of a gravity model to distribute generated traffic around a road network model. This involves the use of GIS and census data to calculate the likely approach routes to a new development. In this case, however, this data is unavailable in this case so a different approach is required.

Taking cognisance of how the GIS method works i.e. a 1 hour drive time with weighting factors applied to populations according to their proximity to the proposed site, we can deduce that the majority of the trips to and from the site will be weighted towards the M1. This is due to the proximate population centres in:

- North and west Dundalk;
- Ardee;
- Carrickmacross;
- Newry and
- Drogheda

The M1, to the west of the proposed site, is the main transport corridor in the area is, it is likely that this is the route that a large proportion of the traffic will approach from and therefore will attract much of the traffic away from the site. Basic journey time calculations using Google Earth based software indicates that vehicles wishing to travel to the north and west of Dundalk town centre will tend to travel west along the Southern Link section of the N52 and approach these areas via the N52 Ardee Road. This may be due, in part, to the one way system which operates in the town centre. This point along with the weight assigned to the M1 indicates that the majority of traffic from the site will enter/exit the proposed site from the west towards the motorway interchange.

Traffic surveys have identified that significant queuing and delay occurs at the N1/N52/R132 junction. This can only be exacerbated by the traffic generated by this proposal, thus the results of any further modelling will be purely academic; however it will be demonstrated that this junction does not sustain significant impact which would normally require further analysis or remediation. Elaborate mitigation measures are proposed to relieve this junction, however, until these measures are implemented, traffic will tend to avoid congested junctions if alternative routes are available which are known to result in shorter journey times. Therefore the approach using the N52 to the west of the site is much more attractive to a road user on a congested network.

Discussion with planners at Louth County Council has indicated that junctions sustaining an impact of 10% to the two-way flow on one or more of its arms should be considered for detailed assessment.

Proposed traffic diagrams for the year of opening 2010, 2020 (10 years after the assumed year of opening respectively) are included in **Volume 3, Appendix B**. These diagrams show the traffic distribution for the existing dominant movements. Upon consideration of percentage impacts associated with distributing traffic under existing proportions, as included in **Volume 3, Appendix B**, only junctions to the west of the site, including the site access, will require detailed analysis.

The reason for the developments seemingly small impact lies with the way in which the shift patterns are managed. The traffic associated with the development peaks i.e. at 0700 – 0800 and 1600 – 1700 does not affect the peak hour on the traffic network, which remains at 0815 – 0915 and 1700 – 1800. TA guidelines state that it is the peak hour, as a combination of existing and proposed traffic, which should be modelled, with regard to the above these peaks are as per the existing network peak hours.

Whilst it is apparent that a substantial impact would be sustained on the road network during the development peak, we would indicate that this is an artificially high impact due to the relatively low level of background traffic. Therefore the correct approach is to assess the traffic proposal for the network peak hours as described above.

It must be stressed that while this development will not materially impact the congested areas of the local network, this wholly depends on the assumed shift pattern being adhered to as per **Table 8.3**.

The computer modelling packages ARCADY and PICADY are used to model roundabouts and priority junctions respectively, LinSig is used to model any signal controlled junctions on the network.

Environmental impacts due to any additional air or noise pollution has been assessed within Chapter 9 – Air Quality and Climate and Chapter 10 - Noise of this volume of the EIS. 24 hour two-way flows have been calculated by factoring the average peak hour flow by 12, 18 hour flows represent 5/6 of the 24hour flow. Conclusions drawn from this assessment are included in the relevant chapters.

8.5 MITIGATION

8.5.1 Proposed Roads Infrastructure

The Dundalk and Environs Development Plan (DEDP) along with the Mullagharlin Framework Plan gives an outline of the proposed road network that will be constructed as part of the development of the lands to the south of Dundalk. These road improvements are to be predominantly developer led.

The main thrust of these improvements are to provide relief to the congested areas of the road network in Dundalk, these include the Eastern Bypass Road and the R132 Dublin Road. **Figure 8.2** shows a representation of the proposed road infrastructure extracted from the Mullagharlin Framework

Plan, the IDA site is highlighted to the bottom left in orange, more detailed extracts are included in **Volume 3, Appendix B**.

Detailed plans in **Volume 3, Appendix B** show the protected areas in and around Dundalk that have been reserved for future road construction. The site access roundabout and associated approach arms is an example of one such scheme becoming committed. All roads that will access to this site will be designed to NRA guidelines and will have capacity for traffic associated with the development of these and adjacent lands.



Figure 8.2 Proposed Road Infrastructure

A new road to the north into Dundalk town centre will provide relief for the R132 Dublin Road; however the Framework Plan also takes into account of the congested junction at the N1/N52/R132. It is envisaged that other future schemes in the vicinity of this site will require the provision of a roundabout at this junction in order to improve traffic flow. However, we suggest that this measure is not currently required as this junction does not experience significant impact as a result of this proposal along with the fact that alternative routes are available as described in Potential Impacts section.

At present congestion is occurring at the R132 N52 junction at the morning and evening peaks. Louth Co. Co. are currently examining the possibility of providing additional lanes and adjusting the traffic light sequencing to provide additional capacity at this junction. The provision of the section of the Dundalk Western Infrastructure between the IDA roundabout and Priorsland will also improve the situation at this junction. At present an EIS for this section of the Western Infrastructure Road is being prepared.

With remedial measures set to be put in place over the next 10 – 15 years this means that traffic impacts shown on the network for future design years will never actually be reached. It is therefore

concluded that due to the nature of the proposals for road infrastructure to which this development will contribute, all traffic impacts associated with this proposal will be mitigated within the timeframe of the local development plans.

8.5.2 Curtailing Private Car Use

The underlying theme in all future proposals for lands under control of the Mullagharlin Framework Plan is a significant move towards the reduction of journeys made by the private car. This will be achieved through the design of new infrastructure incorporating alternative modes of transport as a primary concern and a measure to mitigate transportation impact as a result of the development of these lands.

The importance of public transport provision cannot be overemphasised and will be paramount to any future design of the infrastructure. Proposals within local development plans are for a new railway station located to the northern side of the N52 with adjacent park & ride facilities as well as numerous "soft" public transport corridors penetrating the lands in and around the proposed site. All will be designed to current standards, encouraging the use of such facilities other than the private car.

The location of the proposed development proximate to existing frequent bus links as well as to the proposed future Railway Station, Park and Ride and Bus Interchange, will ensure a significant level of public transport options proximate to the subject site on operation, thus enhancing the overall sustainability of the proposal and substantially decreasing potential traffic increases as a result of the proposal.

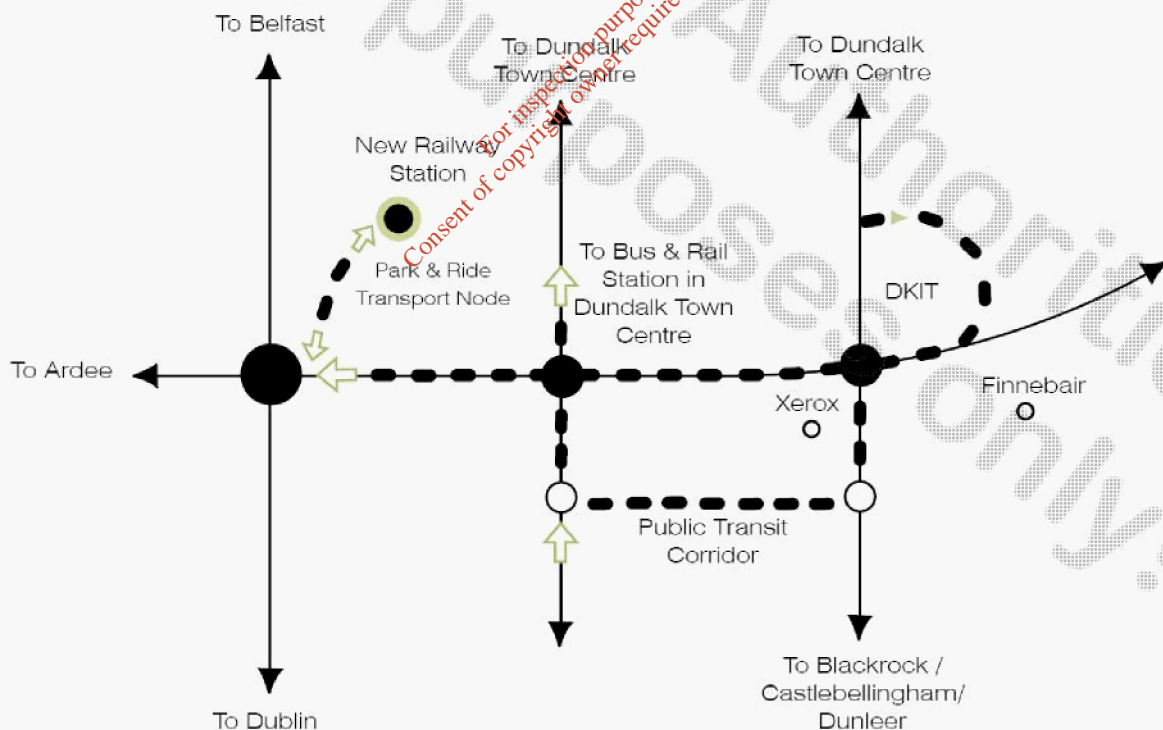


Figure 8.3 – Public Transport Concept Plan

Figure 8.3 shows an extract from the Mullagharlin Framework Plan. The central roundabout is the newly constructed site access, with a proposed secondary route to Dundalk town centre departing to the north.

It is the intention of IDA Ireland to assist in the promotion of a shuttle bus service for staff in the Science and Technology Park as soon as the development commences to operate as a permanent workplace. Such a bus service will, at a minimum provision, provide a Town to Park circular link taking in Dundalk Railway and Bus Stations to offer connections for those commuting longer distances and utilising public transport.

Bus Stop/Shelter locations are allowed for along the main site access roadway in the site planning and suitable pedestrian paths to the various building forecourts will be laid out as part of the landscape detailing for the site.

8.5.2.1 Pedestrian and Cycling Infrastructure Provision

Pedestrian access to the application site will be via the public vehicular accesses, linking with existing pedestrian routes along the surrounding road network. Lowered kerbs will be introduced at adjacent footways to assist wheelchair users and others with a physical impairment. Tactile paving will also be introduced where required to facilitate the safe movement of visually impaired persons to and within the site. Pedestrian desire lines will be given consideration when designing any future roads scheme.

The Dundalk and Environs Development Plan proposes numerous new cycle paths that will link the existing spurs, forming a cycle network around the town. The extent of existing and proposed cycle routes is and around Dundalk is shown in **Volume 3, Appendix B**.

Traffic calming measures will be applied to the internal road network within the site to keep internal aspects below 30 kph. No dedicated cycle lane is required within the site as vehicles will be travelling at low speeds.

Cycle storage will be provided throughout the site to allow employees to have space to store cycles..

8.5.2.2 Parking Provision

The development shall be of phased construction and the forming of parking areas shall broadly follow the sequence of individual building sites being developed.

Overall parking layouts that form part of the Planning Application indicate the maximum proposed provision, as planned to date, but this may not be fully realised and only partially provided in certain areas as staff transport needs are catered for in supplemental ways and public transport infrastructure is developed in the area.

8.5.2.3 Mobility Management Plan

A detailed mobility management plan (MMP) will be prepared by future clients based at the proposed biotechnology facilities. This will include a statement on the nature and extent of facilities and initiatives that will be considered for provision both within and in the vicinity of the site, that would facilitate and encourage the use of non-car modes. Preparation of the MMP will be in accordance with the DTO Advice Note – Mobility Management Plan and will include the following stages

- Staff Travel and Attitudinal Survey – on completion and occupation of the development or phase of the development

- Establishment of MMP co-ordinator and steering group
- Implementation of measures such as
 - The development of a car sharing scheme
 - A parking management scheme which restricts parking availability to specific groups such as car sharers (of particular importance where restrictive parking standards are applied)
 - Provision of car pool for use by employees during business hours – to reduce the need for car commuting
 - Provision of a range of cycle facilities including sheltered, secure cycle parking located close to main entry points to buildings,
- Review of the MMP at intervals.

8.6 RESIDUAL IMPACTS

8.6.1 Junction Modelling

The Computer modelling package PICADY has been used to show that the existing junction at Marlbog Road/Mullagharlin Road will continue to function within capacity for the proposed level of traffic for the design year 2020. The results of this analysis are presented in **Table 8.7**.

The Computer modelling package ARCADY has been used to model the existing junction at the site access roundabout to the N52 for base and proposed traffic at the assumed year of opening, 2010 and the design year 2020 as well as M1 interchange roundabout for the proposed level of traffic for the design year 2020. The results of this analysis are presented in **Table 8.8** and **Table 8.9**.

Table 8.7 Results for Proposed Traffic at Marlbog Road/Mullagharlin Road Junction

	Arm	Max RFC	Max Queue	Delay (Min/Vehicle)
AM PEAK 2020	B – CD	0.024	0.0	0.12
	B – AD	0.040	0.0	0.19
	A – BCD	0.156	0.2	0.12
	D – AB	0.121	0.1	0.11
	D – BC	0.040	0.0	0.15
	C – ABD	0.013	0.0	0.11
PM PEAK 2020	B – CD	0.069	0.1	0.15
	B – AD	0.052	0.1	0.15
	A – BCD	0.098	0.2	0.12
	D – AB	0.135	0.1	0.12
	D – BC	0.059	0.1	0.14
	C – ABD	0.010	0.0	0.11

Arm A – Marlbog Road east
Arm C – Marlbog Road west

Arm B – Mullagharlin Road south
Arm D – Mullagharlin Road north

Table 8.8 Results for Base Proposed Traffic at N52 Site Access Roundabout

	Arm	Max RFC	Max Queue	Delay (Min/Vehicle)
AM Base 2010	A	0.300	0.3	0.05
	B	0.109	0.1	0.06
	C	0.882	7.0	0.15
	D	0.000	0.0	0.00
AM Prop 2010	A	0.366	0.6	0.05
	B	0.293	0.4	0.08
	C	1.030	46.6	0.55
	D	0.000	0.0	0.00
PM Base 2010	A	0.573	1.3	0.07
	B	0.077	0.1	0.07
	C	0.406	0.7	0.05
	D	0.000	0.0	0.0
PM Prop 2010	A	0.610	1.5	0.07
	B	0.216	0.3	0.08
	C	0.436	0.8	0.05
	D	0.000	0.0	0.00
AM Base 2020	A	0.348	0.5	0.05
	B	0.113	0.1	0.07
	C	1.023	43.8	0.50
	D	0.000	0.0	0.00
AM Prop 2020	A	0.415	0.7	0.06
	B	0.305	0.4	0.08
	C	1.180	172.6	2.68
	D	0.000	0.0	0.00
PM Base 2020	A	0.662	1.9	0.08
	B	0.085	0.1	0.08
	C	0.456	0.8	0.05
	D	0.000	0.0	0.00
PM Prop 2020	A	0.701	2.3	0.09
	B	0.238	0.3	0.09
	C	0.488	0.9	0.06
	D	0.000	0.0	0.00

Arm A – N52 to M1 Arm B – Site Access
 Arm C – N52 from M1 Arm D – Future Road to North

Table 8.9 Results for Proposed Traffic at M1 Interchange Roundabout

	Arm	Max RFC	Max Queue	Delay (Min/Vehicle)
PM Base 2020	A	0.544	1.2	0.09
	B	0.271	0.4	0.05
	D	0.569	1.3	0.05
	E	0.478	0.9	0.07
PM Prop 2020	A	0.182	0.2	0.04
	B	0.343	0.5	0.05
	D	0.325	0.5	0.04
	E	0.185	0.2	0.04

Arm A – On-slip from Belfast Arm B – From Dundalk
 Arm D – On-slip from Dublin Arm E – From Ardee

The M1 interchange will continue to operate within capacity at the design year. However, it is clear that on consideration of base traffic, even at the year of opening, the N52/Site Access roundabout will be over capacity.

The nature of the traffic movements at this junction displays a clearly dominant flow along the N52, thus the junction may benefit from signal control at future design years.

The signalised junction in the area that experiences significant impact as a direct result of development of these lands in line with this proposal has been modelled using the software package LinSig. The junction in question is at N52/Mullagharlin Road.

This has been modelled for the year 2020 using a 90 second cycle time and an all red (pedestrian) phase being called every cycle. Given the location of this junction it is highly unlikely that a pedestrian phase will be called every cycle, therefore the junction has also been modelled without the pedestrian phase being called in every cycle.

The results in **Table 8.10** and **Table 8.11** show that the N52/Mullagharlin Road junction will continue to function within capacity at the design year 2020, if a balance between the two cycles can be reached.

Table 8.10 AM Results for LinSig Model for Proposed Traffic at the Signal Controlled junction at Mullagharlin Road/N52

Layout	Arm	Link	Degree of Saturation (%)	Queue Length	Practical Reserve Capacity
Proposed AM Peak 2020 (all red)	Mullagharlin Road north	1/1	69.8	6.8	-1.3%
	N52 east	2/1	38.2	11.7	
	Mullagharlin Road south	3/1	37.5	2.3	
	N52 west	4/1	91.2	47.0	
Proposed AM Peak 2020	Mullagharlin Road north	1/1	37.2	5.5	36.5%
	N52 east	2/1	27.6	6.8	
	Mullagharlin Road south	3/1	64.5	3.7	
	N52 west	4/1	65.9	25.1	

Table 8.11 PM Results for LinSig Model for Proposed Traffic at the Signal Controlled junction at Mullagharlin Road/N52

Layout	Arm	Link	Degree of Saturation (%)	Queue Length	Practical Reserve Capacity
Proposed PM Peak 2020 (all red)	Mullagharlin Road north	1/1	53.1	6.8	64.1
	N52 east	2/1	54.8	18.3	
	Mullagharlin Road south	3/1	18.7	1.0	
	N52 west	4/1	41.4	12.7	
Proposed PM Peak 2020	Mullagharlin Road north	1/1	37.5	6.1	139.9%
	N52 east	2/1	37.4	10.4	
	Mullagharlin Road south	3/1	32.6	1.6	
	N52 west	4/1	28.3	7.2	

8.7 REFERENCES

Reference Details
National Roads Authority (September 2007) Traffic and Transport Assessment Guidelines.
DTO (July 2002) Advice Note – Mobility Management Plans

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