

6. Traffic

6.1 Introduction

This section discusses the traffic related effects/impacts of the N9/N10 Waterford to Powerstown Scheme. The proposed road development will replace sections of the existing N9 and N10 National Primary Roads between Waterford and Powerstown. The existing roads will be re-designated when the road development is opened to traffic.

Traffic analysis has two main functions. Firstly, predicted daily flow levels are required to establish the design standards of the proposed road, though it is acknowledged that other factors such as national policy may well influence the final choice of standard applied.

Secondly, predicted traffic patterns are required to facilitate preliminary junction design. In this case, the normal requirement (for Inter-Urban roads) is the 50th highest annual hourly flow in the scheme design year.

In addition to the above, predicted flows on the proposed and current network are also required for environmental evaluation purposes and for economic analysis.

This Chapter of the report describes the development of the traffic model used to predict the traffic patterns and the traffic growths used, and describes the collection of existing traffic data. Finally, the traffic impacts as a result of the proposed road are assessed in the operational and construction phases, including both the stand-alone scheme and combined with the N9 Kilcullen to Powerstown Scheme.

6.2 Traffic Model

The route selection of the proposed road was supported by a traffic model covering the whole Kilcullen to Waterford Scheme. The model is a capacity restraint traffic model using the TRIPS suite of programs, which has been developed to assist in the development of the preliminary design and in the environmental evaluation of the proposed road. The model reflects the latest policy guidance and incorporates the proposed junction policy.

The model incorporates the following data:

- A matrix of movements including, where possible, all movements that may transfer to the new road;

- A skeletal network representing the road network in the route corridor; and
- speed-flow information.

The matrix of movements was derived from a combination of existing data and the results of specific roadside interview surveys, which were all related to a system of 144 zones used for previous studies (Model I). A finer zoning system comprising 184 zones (Model II) was developed during the Route Selection Stage by sub-dividing zones within the study area. Newly collected data was coded into these finer zones enabling more accurate predicted traffic assignments to be carried out at Preliminary Design Stage.

The model was further amended in 2003 to reflect the likely implications of the 'National Spatial Strategy' (NSS) and the reduction of the operational speed limit. The NSS, which was published in late 2002, outlined a mechanism for decentralisation of the intense levels of economic growth observed in the Greater Dublin area with a view to encouraging growth in the regions. The change in operational speed limit arose from the decision that the proposed road will be designated a 'high quality dual carriageway' with a 60 mph speed limit – the previous modelling having assumed 70 mph.

Subsequently there have been further changes to reflect the anticipated metrication of speed limits (100kph instead of 60mph) and a revision of national traffic growth forecasts (see Section 6.4).

Output from the traffic model is used as a basis of the flow predictions (see Section 6.6).

6.3 Data Collection

In order to strengthen the model, supplementary data was collected, including;

- Origin/Destination Surveys
- Automatic Traffic Counts
- Consideration of transfers from parallel routes
- Junction Surveys

These survey methods are discussed below.

6.3.1 Origin and Destination Surveys

Origin / Destination Surveys were carried out by means of Road Side Interview (RSI) to establish where traffic using the existing network is travelling from and to. This requires traffic to be

stopped and interviewed. These surveys were carried out in two stages, as follows;

Stage I Surveys

Origin/destination data from surveys Roadside Interviews and Cordon Surveys undertaken in 1997/1998 on the M9, N9 N8 and N11/N30 was available at the start of this study.

Stage II Surveys

Further data was collected in March/April 2001 to provide additional observation of inter-urban movements. This was achieved through roadside interview surveys at Stoneyford on the N10, and at Athy on the N78. These surveys enabled the more accurate identification and modelling of trips between:

- Waterford and Kilkenny;
- Waterford and Athy; and
- Kilkenny and Athy.

While the above surveys completed the matrix of key inter-urban movements, additional roadside interviews and classified vehicular counts were undertaken concurrently to update the finer Stage II matrix so that a more accurate representation of strategic traffic movements through the network could be developed. These additional survey sites were:

- Athy on the R417;
- Castledermot on the N9 and R418;
- Baltinglass on the N81;
- Thomastown on the N9 and R700; and
- East of Kilkenny on the N10.

In addition, directional volumetric and speed data measurements were collected at automatic traffic count (ATC) sites over a period of at least 2 weeks at the following sites:

- N10 between Stoneyford and the N9/N10 junction
- N78 between Athy and the N78/N80 junction
- R417 between Athy and Carlow
- N9 between Castledermot and Carlow
- R418 between Castledermot and Tullow
- N81 between Baltinglass and Rathvilly
- N9 between Thomastown and the N9/N10 junction
- R700 between Thomastown and New Ross

- N10 between Kilkenny and Paulstown

Combination of Stage I and Stage II Surveys

Since the roadside interview surveys were carried out in different years and covered different time periods it was necessary to factor the data to a common base. For the purpose of this study the common base was taken to be 1998 annual average daily traffic (AADT) flows. Where estimates of the same movement were available from both the Stage I and Stage II surveys, data from the March/April 2001 Stage II surveys was used in the assignment matrix. Separate matrices have been created for cars, light goods vehicles and heavy goods vehicles.

6.3.2 Junction Surveys

Further surveys involving classified junction counts supported by automatic traffic counters were carried out in May 2002 to assist in junction design. 12 hr full turning movement counts were at the following locations:

- N10 Danesfort Crossroads (N and S)
- N10/R699 junction, Knocktopher
- N9/R704 junction at Mullinavat
- N9/Local road junction at the southern end of Mullinavat

6.3.3 Journey Time Surveys

The requirement for journey time surveys was twofold. Firstly, the journey time information allowed verification of end-to-end journey times as predicted by the traffic model, providing an additional tool for calibration of the base year model. Secondly, the journey time information is an important input to the Economic Assessment, as it assists in the determination of the appropriate speed-flow function for each road link, and hence the improvements in journey times on existing roads as a result of reassignment of traffic onto the proposed route.

The journey time surveys, measuring journey time and delay, were collected on all links throughout the modelled network, over a 2 week period on a Tuesday, Wednesday and Thursday in February 2003.

6.3.4 Transfer from Parallel Routes

Roadside interview data collected in April 1997 as part of the NRNS – Marginal Route Corridor Study was used to generate estimates of end-to-end traffic patterns on the major inter urban routes. These figures have been compared with the values calculated for use in this study.

The NRA Assessment of the Waterford – Dublin Route (February 2000) found that at 1997 traffic levels:

- 56% of Waterford – Dublin trips travel the N9 route via Thomastown and Carlow
- 19% of Waterford – Dublin trips travel the N9/N10/N9 or the N9/N10/N78 routes via Kilkenny
- 25% of Waterford – Dublin trips travel the N11 route via Enniscorthy and Arklow

The potential transfer of trips to the N9/N10 corridor was considered in more detail for the study of the complete N9/N10 Kilcullen to Waterford Scheme, using the Stage I roadside interview data.

Tabulated in Table 6.1 below are the most significant movements where route choice is split between trips that already pass through the study area and other trips that use a parallel route corridor. It is considered that these are the only trips that may potentially transfer to the N9/N10 corridor as a result of proposed development of the infrastructure.

The above analysis is based on roadside interview data collected in 1997, prior to the completion of recent significant road improvements on the N7/N8, N9 and N11.

Table 6.2 shows an estimate of the percentage of trips currently using a parallel route corridor that will transfer to the N9/N10 corridor irrespective of the alignment of the proposed new route. These total 407 trips in base year 1998.

6.4 Traffic Growth

The National Roads Needs Study (NRNS) published in July 1998 provided the early basis on which policy decisions for the development of the National Roads network could be made for the twenty-year period between 2000 and 2019. In January 2004, the growth factors provided in the National Road Needs Study were superseded by “Future Traffic forecasts 2002 to 2040 “(FTF). This data has been used to form the basis of the current scheme traffic forecast model. The revised forecasts outline a scenario of higher traffic growth than that provided in the National Road Needs Study, and reflect recent observations of higher growth rates.

Although the source data presents information for a base year of 2002, the model base year is 1998. As such, growth rates from 1998 to 2002 were required to supplement the traffic growth

information to allow factoring of the base year matrices. Such information was referenced from NRA Permanent Counters on the N9 and identified a growth rate of 26% covering the period from 1998 to 2002. The National Primary Road growth rates adopted for the traffic forecasting are therefore summarised in Table 6.3.

The growth forecasts on the National Primary roads are higher than those on the National Secondary roads. This is explained by the population projections described in the NRNS. Over the next twenty years it is forecast that there will be a modest increase in overall population that is concentrated in the principal towns and cities. At the same time, the decrease in the rural population is expected to continue. Although no regional data regarding car ownership or car utilisation exists, it is anticipated that growth in overall car usage will continue to be associated with growth in wealth, which is likely to be greatest in the principal urban areas. Therefore it can be expected that traffic growth rates will continue to be higher on national roads linking the main urban areas.

The Strategic Planning Guidelines for the Greater Dublin Area, however, identifies Athy as a secondary development centre outside the Dublin Metropolitan Area and advocates the promotion of development within such centres to facilitate a high level of employment activity, high order shopping and a full range of social facilities. Furthermore, the 1999 Kildare County Development Plan identifies Athy as a primary growth centre with ample room for future expansion of the town within its development boundary for the foreseeable future, while the Urban District Development Plan has established a target population for Athy of 12,500 by 2006, a planned population increase of almost 136 per cent on the 1996 population of 5,306 over 10 years.

Since Athy is the major centre of population on the N78 it can be argued on the basis of the foregoing evidence that the National Secondary road growth forecasts contained in the NRNS are likely to be exceeded on the N78. As the N77/N78 is the principle National Secondary road in the study area, it was considered prudent for the operational assessment to use matrix growth factors derived from National Primary road forecasts only.

6.5 Proposed N9/N10 Waterford to Powerstown Scheme

6.5.1 General

The road network used in the traffic assessment includes the National Primary and National Secondary roads in the study area, along with those regional roads that are thought likely to be utilised in conjunction with the junction strategy adopted. The base road network also includes all significant road developments that it is understood will be completed before the opening for the proposed route including:

- Kilkenny Ring Road;
- Carlow Inner Relief Road;
- Carlow Southern Ring Road;
- Waterford City By-pass.

6.5.2 N9/N10 Kilcullen to Waterford Scheme

The route between Dublin and Waterford is to be developed to high quality dual carriageway standard to replace the existing N9 and N10 National Roads, which run for 107km between Kilcullen and Waterford.

Although the current road development relates to the provision of a route from Waterford to Powerstown only, this comprises part of the overall N9/N10 Kilcullen to Waterford Scheme. The section of the route between Kilcullen and Powerstown has recently been taken through the statutory process in advance of the current scheme, and for traffic forecasting purposes the scheme north of Powerstown is considered to be a committed road development. Therefore, the traffic flows that result from the development of the N9 Kilcullen to Powerstown Scheme have been included in the Do-Minimum traffic scenario.

With the provision of the N9 Kilcullen to Powerstown Scheme, journey times along the N9 dual carriageway, north of the Powerstown Junction (Junction No. 5) are considerably improved. The result is an increase in the overall traffic levels using the N9 corridor due to the increasing draw of traffic from other parallel routes such as the N78, N81 and the R705. This results in reassignment of trips from the N78 to the N9 and leads to an increase in flows along the N9/N10 corridor south of Powerstown. This reassignment, of the order of 4,000 vehicles per day from the N77/N78 corridor to the N9, is largely confined to traffic to/from Kilkenny City from Athy and other areas west of Carlow.

South of the Dunbell Junction (No. 7), and on other roads south of Kilkenny, the inclusion of the N9 Kilcullen to Powerstown Scheme in the Do-Minimum scenario has no significant effect on traffic flows.

Traffic flows for the 1998 Base Year Flows, the 2010 opening year, and the 2025 design year are summarised in Tables 6.4 and 6.5, and shown graphically on Figures 6.1 to 6.5 in Volume 3 of the EIS. These tables and figures compare the traffic flows with the proposed road development in place between Waterford and Powerstown (Do-Something) against the Do-Minimum flows without the road development.

6.5.3 Scheme Impacts

Waterford City By-pass to Knocktopher

From the N25 Waterford City By-pass, the proposed N9 runs essentially parallel to the existing N9 as far as the town of Knocktopher. The limited frontage activity on the existing road and the low population density through this section means that the majority of traffic is strategic in nature, with limited local traffic activity.

The Do-minimum traffic model shows AADT flows immediately south of Knocktopher of 10,090 and 13,110 vehicles per day (vpd) in 2010 and 2025 respectively, an increase of 81% and 131% from 1998 levels.

A summary of the key findings for this section of the route with the proposed road in place is listed below:

- High levels of trip transfer from the existing N9 to the proposed dual carriageway, with 13,020 vpd between the Mullinavat Junction (No. 10) and the Knocktopher Junction (No. 9), and 12,220 vpd between the Mullinavat Junction (No. 10) and the Waterford City By-pass tie-in in 2025. The slightly lower flows on the proposed road mainline south of the Mullinavat Junction (No. 10) is indicative of the higher volumes using the existing N9 to access the northern suburbs of Waterford City.
- A residual flow of 2,650 vpd and 3,420 vpd on the existing N9 immediately north of Waterford City in 2010 and 2025 respectively. Much of this residual flow exits the scheme mainline along the Waterford City By-pass to access the northern suburbs of Waterford City via the existing N9.

Knocktopher to Paulstown

Traffic on the existing N10 east of Kilkenny City is forecast to increase to 25,480 vehicles per day in 2025, including the contribution from the N9 Kilcullen to Powerstown scheme, an increase of 150% on 1998 flows. Forecast traffic flows on the N10 south of Kilkenny City are somewhat lower, at 9,930 vpd in 2025. This reflects the fact that the key movement to/from Kilkenny City is to/from the east on the N10, most likely a result of Carlow and the Greater Dublin Area as trip generators.

On the existing N9 north of Thomastown, traffic flows of 6,330 and 8,230 vpd in 2010 and 2025 are expected for the Do-minimum. This section of the N9 effectively represents a by-pass of Kilkenny City and forms the main route for long-distance traffic between Waterford and Dublin/Carlow, though heavy vehicles are signed via the alternative N10 route.

The main traffic impacts of the proposed road development on the existing network are:

- The attraction of Kilkenny City as a trip attractor significantly reduces the traffic on the proposed road mainline between the Danesfort Junction (No. 8) and the Dunbell Junction (No. 7). Although the Dunbell Junction (No. 7) provides the main access to Kilkenny from the proposed road, it does not provide an attractive option for journeys to/from the south. For such trips, the existing N10 via the Danesfort Junction (No. 8) forms the main access route between Kilkenny City and areas to the south. Consequently, the actual change in trips on the N10 between Danesfort and Kilkenny is not significant.
- No real impact on the R700 between Kilkenny and Thomastown.
- A reduction of about 69% in traffic on the existing N9 between Gowran and Thomastown. This high level of reduction with the proposed dual carriageway road in place confirms the predominantly strategic nature of existing trips on this link. Such traffic will benefit most from the proposed road.
- A traffic flow of 6,070 vpd and 8,970 vpd on the Kilkenny Link Road in 2010 and 2025 respectively.
- A reduction in traffic levels on the existing N10 between Paulstown and Kilkenny City, where flows reduce by approximately 26% in 2010 and 30% in 2025. The residual flows

on the N10 between Paulstown and Kilkenny City are, however, still reasonably high at 14,670 and 17,880 vpd in 2010 and 2025 respectively. On closer analysis, it was shown that much of the existing traffic travelling to the centre and southern parts of Kilkenny City will exit at the Jordanstown Junction (No. 6) and continue into Kilkenny City via the existing N10. The proposed Kilkenny Link Road, which connects into the Kilkenny Ring Road Extension to the north-east of the City, does not provide as attractive a route for such trips.

Paulstown to Powerstown

A 2-way AADT of up to 10,808 vehicles per day was observed on the existing N9 between Paulstown and Powerstown in 1998. This is forecast to grow to 20,990 and 26,980 in 2010 and 2025 respectively, including the contribution from the N9 Kilcullen to Powerstown scheme, which represents an increase of 150% for 2025. This increase will lead to significant additional delay on the existing road for the Do-minimum scenario.

Transfer of traffic from the N78 to the proposed N9 north of Kilkenny City is evident from the traffic modelling, as a result of the improvement to journey times on the N9 corridor as compared to the N78.

The main traffic impacts of the proposed road development on the existing network are summarised below:

- A significant reduction of trips along the existing N9, where flows between Powerstown and Paulstown decrease by approximately 54%, and transfer onto the proposed dual carriageway mainline. The net effect is a reassignment of approximately 11,330 vehicles per day in 2010 and 14,640 vehicles per day in 2025 from the N9 to the proposed road mainline between Junction 5 and Junction 6.
- A reduction in trips on the N78 north of Kilkenny City as a result of the transfer of trips to the proposed road mainline. The net transfer is up to 840 vpd in 2010 and 1,450 vpd in 2025 and leads to a reduction on the N78 of up to 7% in 2010 and 9% in 2025. This is in addition to the transfer of traffic which will occur as a result of the committed N9 Kilcullen to Powerstown scheme, included in the Do-minimum scenario. The higher level of transfer in 2025 is as a result of increasing journey times on the N78 as a result of general traffic growth.

6.5.4 N9/N10 Waterford to Powerstown (Stand Alone Scheme)

Although the current proposed road development relates to the scheme from Waterford to Powerstown, this is part of the overall N9/N10 Kilcullen to Waterford Scheme, and assumes that the other element of the road development from Kilcullen to Powerstown (N9 North) is in place by the opening year, 2010. This follows from the An Bord Pleanála approval of the N9 North scheme in early 2004. The traffic forecasting demonstrates that the provision of the N9 South as a stand alone road development from Waterford to Powerstown with no extension north of Powerstown would modify the traffic patterns in the study area, with a local reduction in traffic levels using the N9/N10 corridor north of Kilkenny City compared with the situation when the full N9/N10 Kilcullen to Waterford Scheme is open. This decrease would arise out of the reduced attraction of the stand-alone N9 South road development in drawing traffic from other parallel routes such as the N78, N81 and the R705. A discussion of the traffic activity that would exist without the N9 North in place is therefore provided below to give an overview of the traffic implications of such a scenario.

A summary of traffic flows on key links of the network for 2025 is provided in Table 6.6, for both the N9/N10 Waterford to Powerstown as a stand-alone road development (Route 9d41) with the complete Kilcullen to Waterford Scheme (Route 9d42).

The results shows that with the omission of the N9 Kilcullen to Powerstown dual carriageway in the assessment of traffic flows, a shift of traffic from the proposed N9 mainline to the N78 is evident. The reassignment is confined to traffic travelling between Kilkenny City and Athy zones, and between Kilkenny City and other areas west of Carlow.

Modelling of the complete road development shows that such traffic will use the proposed road mainline, which provides a direct route into Kilkenny City and avoids congested sections of the old N9. Without the N9 North in place, however, the existing N9 north of Junction 5 and through Carlow Town leads to higher journey times than the N78 for these particular trips. This reassignment results in decreased flows between Junction 5 and Junction 7 and on the Kilkenny Link and the existing N9/N10 north of Kilkenny City. This reduction is approximately 4,000 vehicles per day on the combined existing and proposed routes.

South of the Dunbell Junction (No. 7), and on other roads south of Kilkenny City, no real change to traffic flows are noted.

6.6 Accident Statistics

Accident statistics for the existing road network along the N9/N10 corridor between Waterford and Powerstown were compiled from database records maintained by the NRA. The analysis was carried out on sections of the N9, N10, N24, N25, N78, R702, R705 and R729, over a five-year period from 1996 to 2000 inclusive, and uses traffic flow information from 1998 to determine accident rates per vehicle kilometre.

The analysis does not take account of statistics for damage-only accidents in the area. These statistics are generally not available or reliable, as they are not comprehensively reported to the Gardaí. A summary of accident information is presented in Table 6.7.

Furthermore, the average number of accidents occurring annually throughout the study area is 102 (see Table 6.8), and there is no definitive pattern of growth or decline in accident volumes throughout the chosen 5-year period.

Two-way AADT flows and road lengths were obtained from the validated base year traffic model (1998) to allow annual vehicle kilometres to be calculated. These figures were then used to compute the number of accidents that occurred on a given stretch of road in terms of personal injury accidents per 10 million vehicle kilometres travelled (pia/10 mvkm) for direct comparison with nationally reported values.

The NRA reported accident rate for the full route from Naas to Waterford in 2000 was 1.6 pia/10mvkm. The section from Waterford to Powerstown, however, returns an accident rate of 2.6 pia/10mvkm. This would suggest that this stretch of road is considerably less safe than other parts of the N9.

An issue of concern was the percentage of fatal accidents along the network at approximately 8% of all accidents. The worst results were recorded along the N10 and R705 with a rate of 12%. This compares to the national average where some 4% of accidents result in fatal injuries, and suggests a higher level of severity of individual accidents along the N9 from Waterford to Powerstown.

These results show, therefore, that overall there are some concerns regarding the existing safety record, and particularly the severity of accidents on the N9 from Waterford to Powerstown.

Furthermore, a closer examination of the geographical spread of accident information identifies particular clusters of accidents at various locations. This implies various deficiencies on the network in safety terms, and is further elaborated below:

- One such location is between Thomastown and the N10, where 35 accidents occurred over the period 1996-2002, 1 of which was fatal.
- A further section is the N9 immediately south of Carlow Town where a total of 52 accidents have occurred, 11 of which involved fatal injuries. The number of accidents here appears to be as a result of the high level of interaction of traffic, which is common in an urban environment. The high level of fatalities is a cause for concern.
- Also of note is the N9/R724 junction at Muine Bheag, where 8 accidents were noted at the junction itself over the study period. Despite the small number of accidents, they are very concentrated at the junction which would suggest either high mainline speeds or a visibility problem at the junction.
- The next area of interest is the N9 between Knocktopher and the railway crossing just north of Mullinavat. This area recorded 32 accidents over the study period with 2 fatal accidents, 7 serious accidents and 23 minor accidents. Clusters of accidents are particularly notable at the two railway bridges crossings with 8 of these accidents occurring at the northern most crossing and 14 occurring at the crossing just north of Mullinavat. This is most likely as a result of safety implications due to the poor alignment and visibility problems through the railway bridges.
- Finally, the section of N9 around Mullinavat seems to have an accident cluster with 20 accidents in total over the study period. This village is located at a crossroads between the R704 and three other minor roads.
- On the N10, an accident cluster was noted over the 2-mile stretch west of Coolgrange, where 17 accidents occurred over the period 1996-2002.

The assessment has described a number of locations where accident clusters exist, some leading to significantly high levels of fatal casualties as a result of traffic volumes and poor alignment of the existing road. The assessment has not addressed the significant cluster of traffic

accidents through urban areas, which is more than likely a result of the high volumes of strategic traffic volumes through the town.

6.7 Operational Impacts of the Proposed Road Development

6.7.1 General

The operational impacts of the proposed road development in traffic terms include the following:

- Reduction in traffic volumes on the existing road network
- Reduction in journey times
- Improvements in safety

These aspects are discussed in the following section and combine to be a major beneficial effect of the proposed road development on the areas served.

6.7.2 Reduction in traffic volumes on the existing road network

As outlined in Section 6.6, the proposed road development attracts a significant proportion of the current traffic flows on the N9 and N10 routes. In particular, on the N9 south of Knocktopher the majority of the predicted Dominimum traffic transfers to the new road, while there is a reduction in some 6,000 vehicles AADT on the existing N9 between Knocktopher and Paulstown (passing through Thomastown). There will also be a reduction of up to 7,600 vehicles AADT on the N10 east of Kilkenny City in 2025. Between Paulstown and Powerstown there will be a transfer of some 14,000 to 16,000 vehicles AADT onto the proposed road mainline.

6.7.3 Reduction in journey times

6.7.4 General

Journey time savings are naturally expected as a result of the proposed road development on the Waterford to Powerstown corridor. The expected savings along the route are to the order of 19 minutes between the Waterford City Bypass and Powerstown.

6.7.5 Improvements in Safety

Transferring the bulk of traffic in the area from the existing N9 and N10 route to a high standard dual carriageway will significantly improve safety for a number of reasons that include the following:

- The provision of grade-separation would eliminate dangerous at-grade crossing manoeuvres;
- On such a road there would be a virtual elimination of pedestrian/vehicle conflict, particularly with the absence of frontage development;
- The road will tend not to be used by cyclists and farm traffic due to the distances between access points.

In general, as a consequence of these features, accident rates on the new route would be expected to be only about 30 – 40% of those on the existing N9 and N10 single carriageways.

6.8 Construction Impacts of the Proposed Road Development

An assessment of the average daily off-site Heavy Commercial Vehicle (HCV) movements is included in section 4.6.6 of this EIS.

In addition, Figure 4.146 shows the HCV flows anticipated on each of the access routes for the construction site.

6.9 Economic Assessment

A broad economic Cost Benefit assessment was undertaken during the route selection study and provided a key input to the selection of the preferred route option. This Economic Assessment has been repeated following the development of the Preliminary Design of the preferred route using more accurate traffic flow forecasts and scheme costings.

The Economic Assessment, undertaken on the basis of a Cost Benefit Analysis (COBA), provides a comparison of social costs and benefits arising out of the construction, maintenance and use of the proposed road development that accrue over its life. Costs and benefits are expressed in 2002 prices, with all future costs and benefits discounted back to the 2002 base year using a discount rate of 5%. COBA then quantifies and reports the values of all costs and benefits, the cost benefit ratio, and the Net Present Value of the road development.

The assessment has used COBA11 in line with NRA guidelines (January 2004), which describe the application of COBA11 to reflect Irish conditions. The assessment has produced the following results expressed in terms of 2002 values and prices:

Low Growth

- Net Present Value of Benefits (NPVB) €127m
- Net Present Value of Costs (NPVC) €401m
- Net Present Value (NPV) - €136m
- Benefit:Cost Ratio 0.67

High Growth

- Net Present Value of Benefits (NPVB) €127m
- Net Present Value of Costs (NPVC) €401m
- Net Present Value (NPV) - €110m
- Benefit:Cost Ratio 0.73

6.10 References

- (1) National Spatial Strategy, 2003
- (2) National Roads Needs Study – Marginal Route Corridor Study (April 1997), NRA
- (3) National Roads Needs Study (July 1998), NRA
- (4) Future Traffic forecasts 2002 to 2040 (FTF) (Jan 2004) NRA
- (5) Strategic Planning Guidelines for the Greater Dublin Area (1999)
- (6) Kildare County Development Plan (1999)
- (7) Road Accident Facts in Ireland - RS 457 (2001), NRA

Table 6.1 – Trips on N9/N10 and other Parallel Route Corridors

	Number of Trips Currently Passing Through the Study Area		Number of Trips Currently Using a Parallel Route Corridor	
	M9	N81	N11	N8
	1998 AADT	1998 AADT	1998 AADT	1998 AADT
Wexford Town – Dublin	360	55	630	-
Enniscorthy – Dublin	60	95	255	-
New Ross – Dublin	80	0	155	-
Waterford City & County – Dublin	995	0	290	-
Clonmel – Dublin	360	-	-	195
North Kilkenny – Dublin	175	-	-	80

Table 6.2 – Estimated Transfer of Trips to the N9/N10

	Number of Trips Currently Using a Parallel Route Corridor		Estimated Transfer of Trips to the N9/N10 Corridor
	N11	N8	Percentage Transfer
	1998 AADT	1998 AADT	
Wexford Town – Dublin	630	-	10% ⁺
Enniscorthy – Dublin	255	-	10% ⁺
New Ross – Dublin	155	-	20% ⁺
Waterford City – Dublin	290	-	90%
Clonmel – Dublin	-	195	10% ⁺
North Kilkenny – Dublin	-	80	10% ⁺

⁺ These low transfer estimates indicate that the proposed new route is unlikely to attract many of these trips to the N9/N10.

*It is noted that the relatively low transfer estimate for New Ross trips is a reflection of the poor connection New Ross currently has with the N9/N10 via the R700 and Thomastown. With the proposed N9/N10 alignment close to Kilkenny City, New Ross to Dublin trips that currently use the N11 will only receive a benefit over the northern section of the study area, which for many destinations in Dublin (particularly south east Dublin) is unlikely to be enough of an incentive for vehicles to transfer.

Table 6.3 Future Traffic Growth Factors for the N9/N10 Corridor (Index 100 = 1998)

									Limit	
	1998		2002		2010		2025		2040	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
National Primary	100	100	126	126	171	168	221	226	248	284

Table 6.4 – AADT Link Flows for 2010 (Route 9d42)

	Link	1998 Existing	2010 Do-Minimum	2010 Do-Something
1	Powerstown to Jordanstown Junctions	0	0	12,233
2	Jordanstown to Dunbell Junctions	0	0	10,538
3	Dunbell to Danesfort Junctions	0	0	4,465
4	Danesfort to Knocktopher Junctions	0	0	10,420
5	Knocktopher to Mullinavat Junctions	0	0	10,022
6	Mullinavat Junction to Waterford City By-pass	0	0	9,404
7	Kilkenny Link Road	0	0	6,072
8	N9: Powerstown to R724 Junction at Royal Oak	10,808	20,989	9,655
9	N9: R724 Junction at Royal Oak to Paulstown	7,808	15,785	4,451
10	N9: Gowran to Thomastown	3,700	6,332	1,908
11	N9: Thomastown to Knocktopher	4,800	8,659	4,147
12	N9: Knocktopher to Mullinavat	5,654	10,090	68
13	N9: Mullinavat to Dunkitt	6,800	12,052	2,648
14	N10:R702 Junction to Kilkenny	10,209	19,880	14,666
15	N10: Kilkenny to Stoneyford	4,500	7,662	7,709
16	R700: Kilkenny to Bennettsbridge	5,200	9,330	9,230
17	R700: Bennettsbridge to Thomastown	3,900	7,110	7,006
18	R700: Thomastown to New Ross	2,500	4,266	4,254
19	N25: New Ross to Waterford City	12,300	21,030	21,032
20	N78: Kilkenny to Castlecomer	4,190	5,186	4,298

Table 6.5 – AADT Link Flows for 2025 (Route 9d42)

	Link	1998 Existing	2025 Do-Minimum	2025 Do-Something
1	Powerstown to Jordanstown Junctions	0	0	16,158
2	Jordanstown to Dunbell Junctions	0	0	14,777
3	Dunbell to Danesfort Junctions	0	0	5,810
4	Danesfort to Knocktopher Junctions	0	0	13,540
5	Knocktopher to Mullinavat Junctions	0	0	13,024
6	Mullinavat Junction to Waterford City By-pass	0	0	12,224
7	Kilkenny Link Road	0	0	8,966
8	N9: Powerstown to R724 Junction at Royal Oak	10,808	26,977	12,342
9	N9: R724 Junction at Royal Oak to Paulstown	7,808	20,227	5,600
10	N9: Gowran to Thomastown	3,700	8,233	2,586
11	N9: Thomastown to Knocktopher	4,800	11,244	5,369
12	N9: Knocktopher to Mullinavat	5,654	13,105	88
13	N9: Mullinavat to Dunkitt	6,800	15,644	3,420
14	N10:R702 Junction to Kilkenny	10,209	25,477	17,877
15	N10: Kilkenny to Stoneyford	4,500	9,926	9,998
16	R700: Kilkenny to Bennettsbridge	5,200	12,088	11,846
17	R700: Bennettsbridge to Thomastown	3,900	9,220	8,975
18	R700: Thomastown to New Ross	2,500	5,538	5,524
19	N25: New Ross to Waterford City	12,300	27,180	27,183
20	N78: Kilkenny to Castlecomer	4,190	6,961	5,450

Table 6.6 – AADT Link Flows for 2025 (Stand Alone Scheme and Whole Scheme)

	Link	Route 9d41 (N9 South Only)	Route 9d42 (N9 North+South)
1	Powerstown to Jordanstown Junctions	12,110	16,158
2	Jordanstown to Dunbell Junctions	11,010	14,777
3	Dunbell to Danesfort Junctions	5,860	5,810
4	Danesfort to Knocktopher Junctions	13,540	13,540
5	Knocktopher to Mullinavat Junctions	13,020	13,024
6	Mullinavat Junction to Waterford City By-pass	12,220	12,224
7	Kilkenny Link Road	5,150	8,966
8	N9: Powerstown to R724 Junction at Royal Oak	12,690	12,342
9	N9: R724 Junction at Royal Oak to Paulstown	5,780	5,600
10	N9: Gowran to Thomastown	2,700	2,586
11	N9: Thomastown to Knocktopher	5,150	5,369
12	N9: Knocktopher to Mullinavat	90	88
13	N9: Mullinavat to Dunkitt	3,420	3,420
14	N10:R702 Junction to Kilkenny	17,840	17,877
15	N10: Kilkenny to Stoneyford	9,950	9,998
16	R700: Kilkenny to Bennettsbridge	11,750	11,846
17	R700: Bennettsbridge to Thomastown	8,880	8,975
18	R700: Thomastown to New Ross	5,540	5,524
19	N25: New Ross to Waterford City	27,180	27,183
20	N78: Kilkenny to Castlecomer	17,380	5,450

Table 6.7 5 Year Accident Summary by Severity

Description	Total	Fatal	Serious	Minor
N78 Accidents	146	9	19	118
N9 Accidents	227	22	47	158
N24 Accidents	72	4	6	62
N25 Accidents	114	8	28	78
R729 Accidents	27	1	8	18
R705 Accidents	34	4	9	21
N10 Accidents	91	11	13	67
R702 Accidents	15	0	5	10
TOTAL	726	59	135	532

Table 6.3 Accident Summary by pia/10mvkm

Description	Mean/Yr	AADT	Length	pia/ 10mvkm
N78 Accidents	19	4863	41.8	2.9
N9 Accidents	31	7028	67.4	2.6
N24 Accidents	10	15000	2.4	7.3
N25 Accidents	18	12300	25.5	1.6
R729 Accidents	4	535	24.7	16.7
R705 Accidents	5	392	11.8	30.8
N10 Accidents	14	7752	38.6	1.5
R702 Accidents	2	346	11.5	15.1
SUM	102	6027	223.7	2.2