



The National Roads Authority – *Going Places*
National Road Needs Study, 1998



The National Roads Authority
- an Overview of the Authority's
Roles and Functions.

National Roads Improvement
Programme and the National
Development Plan 2000 - 2006.

National Road Project Planning.

Compulsory Purchase Order
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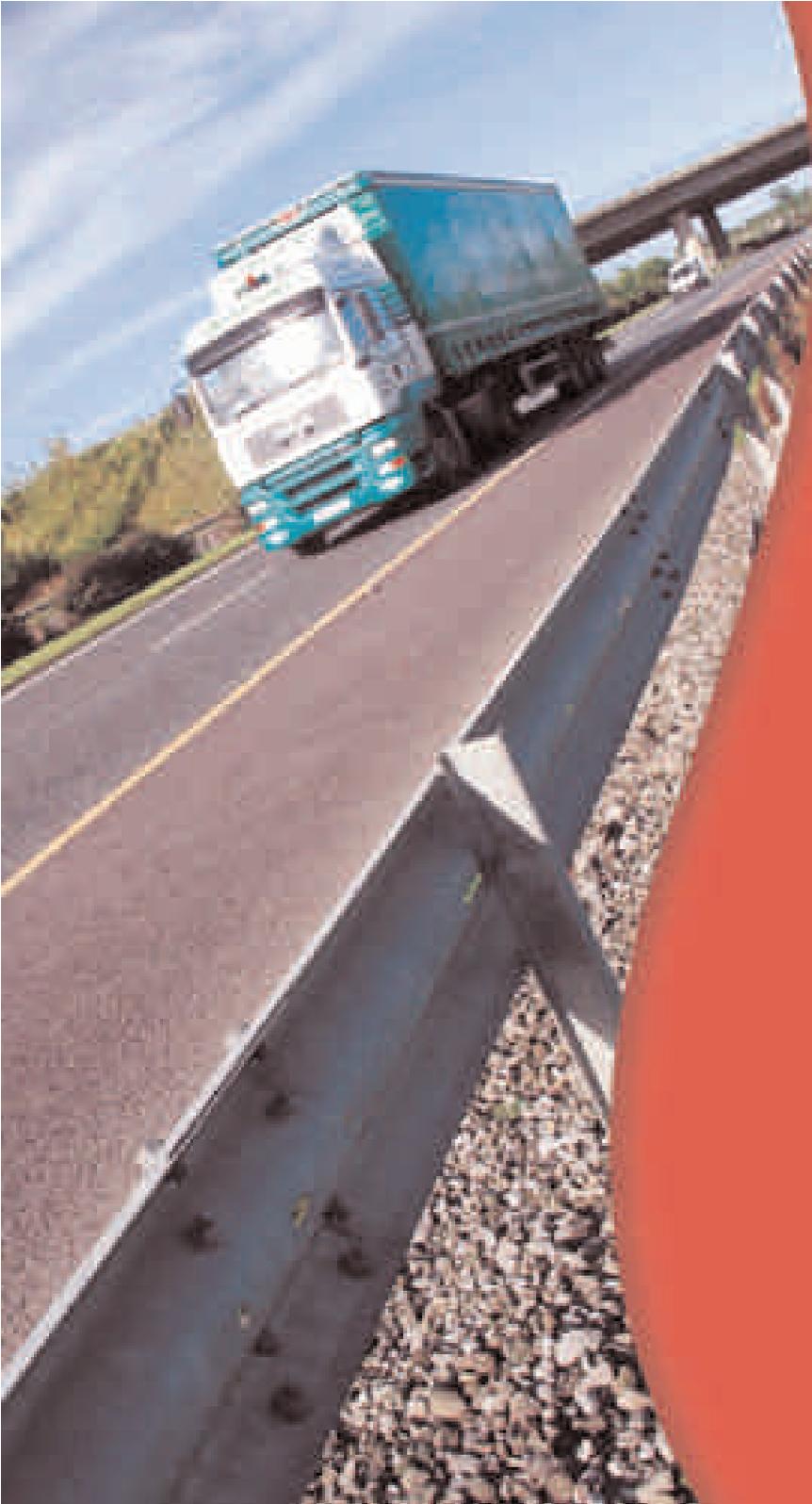
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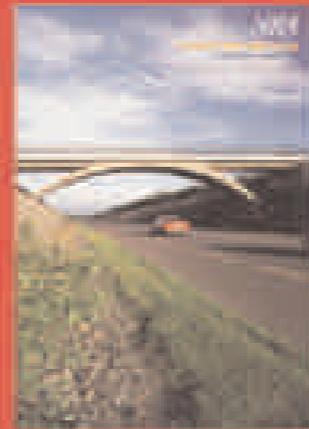
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National Road Needs Study, 1998

The adequacy and performance of the network of national roads are assessed on the basis of the ability of roads to deliver a quality level of service consistent with the efficient movement of traffic. The National Road Needs Study, which was published by the Authority in 1998, represents a comprehensive assessment of the network against the level of service objective of an average inter-urban speed of at least 80kph, which is the equivalent to level of service D.

The Study was intended to assess national road investment needs and to:

- identify the type of road (i.e. motorway, dual carriageway, two lane road) that would be appropriate for each segment of the national road system so as to cater for projected traffic flows over a 20 year period (i.e. 2000-2019) and achieve an average inter-urban travel speed of at least 80 kph, and
- determine the specific road improvements necessary to achieve the level of service objective, their timing and the costs involved.



Motorway

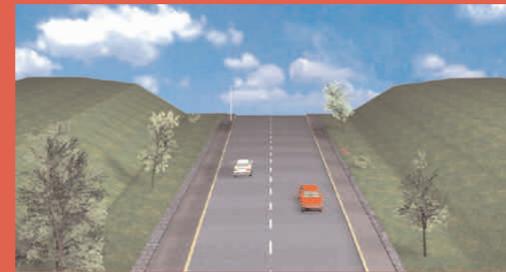
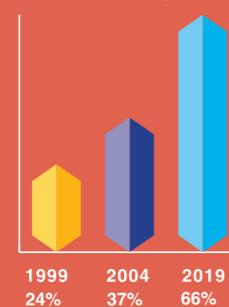


The Findings

The Study indicated that in 1995, 91% of the inter-urban national primary network could meet the minimum level of service requirement. It was estimated that 94% of the inter-urban national secondary network would satisfy this level of service standard, primarily due to the significantly lower traffic levels on the secondary network. However, as traffic increases, an increasing percentage of the network will fail to meet the specified level of service objective without ongoing improvements to the network.

A detailed analysis was carried out to assess the likely performance of the network at the end of 1999 based on traffic levels projected for that time using a growth rate approaching 6% per annum. This demonstrated that 24% of national primary roads and 14% of national secondary roads would be below the specified level of service standard by the end of 1999. Furthermore, in the absence of investment to cater for the forecast growth in traffic, the Study projected that by 2004, 37% of the national primary roads would be below the level of service standard while in 2019, 66% of the national primary network would fail the standard, with about 37% of the national secondary network also not meeting the standard.

Projected deterioration of the National Primary Route Network without the necessary investment



Wide 2 lane

It is clear that in the absence of substantial further investment, the level of service provided by the national road network would deteriorate steadily in the years ahead due to the inability of the network to cater for rising traffic volumes. Such a situation would have serious economic and social implications and would affect the competitiveness of the Irish economy.

Road Types and Level of Service

The carriageway types which make up a road network are chosen on the basis of capacity and level of service (LOS). The capacity of a road link is the ability of that section of road to carry the maximum number of vehicles in safety at an appropriate LOS. The LOS is a technical concept which attempts to describe the travel experience in terms of operating speed, the ability to overtake traffic in safety, traffic congestion, overall safety and driver and passenger comfort. In Ireland, the capacity of a road link is determined in accordance with the principles defined in the US Highway Capacity Manual (HCM).

The manual describes six levels of service from A (best) to F (worst). In the Road Needs Study the Authority's objective for road planning purposes was to achieve a minimum LOS of D, equivalent to an 80kph inter-urban journey speed on the network. This was in keeping generally with the LOS objective defined in the Operational Programme for Transport (OPT), 1994-1999.



Standard 2 lane urban environment



Standard 2 lane

The level of service concerned is relatively modest entailing a degree of vehicle platooning and limitation on passing opportunities. Internationally this service objective would be regarded as a minimum acceptable standard for new national road schemes. Adaptation of LOS D (and the defined improvement needs) resulted in the identification of a mix of carriageway types for the national road network as indicated in the Study ranging from two lane roads to motorways.



National Road Needs Study/National Development Plan, 2000-2006 Relationship

The National Road Needs Study represented only one input into the National Development Plan (NDP), 2000-2006. The NDP also gave due consideration to broader policy issues including regional and industrial development and submissions in this regard from a range of interests, including regional authorities and Forfás.

It was in this context that Government policy for the improvement of national roads, as set out in the NDP, adopted the higher LOS of C objective equivalent to an average inter-urban speed of 94kph on a dual carriageway and 105kph on a motorway for the five major inter-urban routes linking Dublin to Cork, Galway, Limerick and Waterford as well as the M1 Dublin/Belfast road. These routes carry substantial volumes of traffic and play a key role in facilitating access to the regions.

MAX. ANNUAL AVERAGE DAILY TRAFFIC (AADT) FOR LOS				
Road Type	Classification	C	D	E
Standard-2-Lane	Rural	6,500	11,600	20,600
	Commuter	8,400	15,000	26,800
Wide-2-Lane	Rural	7,700	13,800	24,600
	Commuter	10,000	17,900	32,000
Dual Carriageway	Rural	34,600	44,100	53,500
	Commuter	45,000	57,400	69,600
Motorway	Rural	43,500	55,000	62,500
	Commuter	56,500	72,200	81,200

In addition, the NDP has the objective of providing a uniform carriageway type on the five major inter-urban routes either to motorway or high quality dual carriageway standard or a combination of both. The NDP requires that route selection be undertaken “for substantial sections of the routes rather than focusing solely on the delivery of by-passes of congested centres of population”. The combination of these objectives has resulted in the removal of the single carriageway links where they had been specified for sections of the major inter-urban routes in the Needs Study and their replacement with dual carriageway type links. This provides a greater degree of safety than the single carriageway links and satisfies the higher LOS requirement as specified in the NDP. In addition, it facilitates shorter (and safer) journey times, greater certainty of time of arrival/journey duration, and greater driver comfort.

The LOS of D objective continues to apply to all other national primary roads and the Authority continues to give close attention to the findings of the Needs Study as regards the type of road to be provided and the timing of individual road improvement schemes.



Motorways and Dual Carriageways

The high quality dual carriageway roads to be constructed in accordance with the NDP policy will be characterised by the following features:

- An unbroken central median over their full length.
- Grade separated interchanges (i.e. a different level between the main road and the minor road).
- Restricted access, generally only at the specified interchanges, but with 'left-in and left-out' junctions acceptable subject to design standards.

From the road users' perspective these dual carriageways will appear almost identical to motorway sections of the national roads network. The main distinction between both road types concerns permitted users. Motorways may not be used by learner drivers, slow moving vehicles, cyclists, pedestrians, etc. These controls and legal restrictions on access are necessary for road safety reasons and to protect the traffic carrying capacity of motorways. In this way, the efficiency of these transport routes can be maximised and their ability to cater for traffic over the medium to longer term safeguarded, thereby ensuring a good return on the substantial investment involved in constructing motorways. In the absence of development and other controls, the timeframe over which motorways could cater efficiently for traffic would be reduced significantly, as would their service life. Responses to this situation could necessitate construction of extensive lengths of new roads at substantial additional cost considerably earlier than otherwise would be required with further potential implications for the environment.

Can existing Roads be Widened to Provide Motorways?

As a result of the design features of high quality dual carriageways and motorways, the option to build the new route along the line of the existing road network is usually not feasible. The reasons for this are:

- The new road design standards adopted by the NRA to meet the NDP policy objective could not be accommodated within the existing road reservations. It would be necessary to acquire adjoining land and demolish property, including numerous private residences for the full length of the new schemes.
- Access would no longer be permitted onto the new dual carriageway national route from property and farms located along the existing road. One-off properties with frontage onto the existing national primary road would require new access roads to the nearest county or regional road thereby increasing the footprint of the road network.
- Properties and homes remaining in situ would in many cases be closer to the upgraded road network with consequent implications for quality of life (air, noise, etc.) and safety.
- By-passes of villages and towns along the existing road would be required resulting in the 'rosary bead' alignment.
- Community impact would be greater for ribbon type development as there will be no access permitted across the new road.
- The construction phase of on-line projects would involve extensive and complex traffic management in order to seek to maintain live traffic flows on the national routes concerned. This would result inevitably in longer construction periods, additional costs and increased journey travel times for the public for the duration of the works.

- The significant disruption to traffic movements on national routes over extensive sections of the network would have serious implications for economic activity and the efficiency of the network, as well as creating safety hazards for both road users and road construction personnel.
- The development of the new routes off-line means that the existing roads can be used for incident and emergency responses, particularly when it becomes necessary to divert traffic off the main line. This is a common procedure used in most countries for the management of major incidents and emergencies.

