

The development of road transport has been so rapid that, even with the comparatively sparse population of New Zealand, the traffic density in some instances has become such that two-lane roads will no longer meet requirements. The Hutt Road, with its eight thousand vehicles per day, with peaks of twelve thousand, and the Ngahauranga Gorge Road, both adjacent to Wellington, are in the category where two lanes are no longer adequate.

These roads are being realigned and reconstructed as four-lane highways with central dividing-strips, separate ways for pedestrians, stock, and cyclists, and with parking-space clear of the carriage-ways, which is essential if the road is not to be narrowed to a two-lane standard by stationary vehicles. When these works are completed within the next few months two important sections of highway will have become adequate for their traffic densities with the maximum of safety. Statistics from overseas countries conclusively demonstrate that the physically divided multiple-lane type of highway, in which each track is confined to traffic proceeding in one direction only, and in which parking-space is provided clear of the carriage-ways, not only improves the traffic-flow and increases the capacity, but also very definitely reduces the dangers of motoring.

The State highways approaching Auckland and Christchurch are now being designed as divided multiple-lane highways to provide segregation of different classes of traffic, and an extra outlet to the north of Dunedin is under construction.

Road and street intersections give much cause for serious thought. They not only cause serious interruptions in the free flow of traffic, but they are also critical and potential danger-points. Separation of the road grades by subways and overbridges is the satisfactory and ultimate solution of the problem, but the high cost of this method of treatment generally precludes its adoption. In the meantime it is the Board's aim to provide adequate sight-distances at intersections and junctions in rural areas; and, where traffic intensities are greater, the "roundabout" or the "channelized" type of traffic-filter which regulates traffic flow, and will provide a measure of protection which is not present with wide open spaces where uncontrolled operation of vehicles causes much confusion. In these latter types of layout the area of conflict between different streams of traffic is much too large, and is consequently a prolific source of accidents.

In towns and built-up areas, where speeds are restricted to 30 miles per hour, minimum sight-distances at intersections of 120 ft., with a preference for 150 ft., should be provided. Allowing only half a second reaction time, the stopping-distance of a car at 30 miles per hour on an average wet bituminous surface, with a coefficient of friction of 0.3, is approximately 120 ft. In business portions of a town such sight-distances will usually be quite impracticable, but, owing to the density of traffic, speeds in shopping and commercial localities will necessarily be much below 30 miles per hour, and stopping-distances will be correspondingly less. On rural highways, where 60 miles per hour may obtain, the stopping-distance on the average wet bituminous surface may be 7 chains, so that sight-distances of at least 500 ft. should be the aim.

The "roundabout" type of intersection, the merit of which lies in the "interweaving" capacity of the units of converging traffic-streams at a moderate speed, is generally much less costly than the overbridge or "clover-leaf" treatment, but even the "roundabout" occupies a large area of land the acquisition of which is often impracticable. Representations are occasionally made to the Board that a small circular island "roundabout" should be installed at intersections, but small circular islands do not serve the functions of a "roundabout," which must primarily be large enough in diameter to provide sufficient space for a vehicle to gradually weave through the traffic into its proper outgoing lane. In the case of a properly designed "roundabout" there is no direct right-angle crossing of opposing lanes of traffic. With the small circular island, however, there is insufficient space to make the gradual interweaving movement and, compared with the plain intersection, the points of conflict may be increased.

At "channelized" intersections traffic is segregated into directional lanes by the installation of islands which clearly indicate the channels for the movement of vehicles in every desired direction. It is a first essential that the design should be simple and that motorists should be guided into their correct paths without hesitation or doubt. Well maintained and readily visible directional signs, particularly on the pavement itself, are often necessarily a part of the "channelized" system, but such signs must be quite clear in meaning and carefully placed.

The junction of the Hutt Road and Ngahauranga Gorge Road, both of which are multiple lane highways with a central dividing strip, is being laid out on the "channelized" principle so that, if necessary, at a future date a modified "clover-leaf" layout can be adopted. The dividing strips are gradually widened out until a width of at least 20 ft. is attained at the intersection. The traffic-lanes are then, as it were, cut through the widened strips to form islands separating the various paths in such a way that vehicles make a direct crossing of traffic moving in one direction only. The islands of 20 ft. width allow space for pausing or taking refuge before moving on to the next stream of traffic.

No general rules can be laid down to ensure an ideal condition for all road junctions and intersections. Each particular crossing has its own problems and requirements and must be considered accordingly, but there are certain first principles which should be the basis of any treatment. There should be adequate sight-distance at plain intersections for speeds which are likely to obtain, and at the more important crossings the layout should be, firstly, so simple that even strangers have no doubt as to the path to be followed, and, secondly, such that the points and areas of conflict are reduced to a minimum.

Another aspect of geometrical layout to which the Board has given special study and consideration is the treatment of horizontal curves. In the interest of the safety and the comfort of motorists, and the unhampered flow of traffic, new roads must be laid out with curves and superelevations to suit present and future traffic requirements, and old obsolete roads must be brought up to a similar standard.