Municipalities of Melbourne (Part), Prahran, Malvern, Camberwell (Part), St. Kilda (Part), Brighton, Caulfield, Oakleigh (Part), and Malvern (Part)—continued.

Number.  Description of Route.  Reference to Plan—Sheet No.

98  Notting Hill to Clayton North—
Having regard to the distance between Box Hill-road and the proposed circumferential road (No. 99), it is proposed that Notting Hill-road and its continuation southerly from Ferntree Gully-road (Gardiner’s Lane) be included in the main roads scheme, the latter also being extended southerly to join the outer suburban ring road at North-road

99  Circumferential Road—Glen Waverley District—
Southerly from the point where the circumferential route, 100 feet wide, is planned to cross Arterial Route No. 18, Route No. 75 is continued to join Springvale-road south of High Street-road, thence leaving Springvale-road immediately south of the Glen Waverley Railway Station to proceed south-westerly and southerly to cross North-road about midway between Springvale and May’s roads. Portions of this route in the vicinity of the Glen Waverley Station have already been secured in plans of subdivision.

Route No. 118 is the further continuation of this road as a circumferential highway, and Route No. 112 is the one planned as its principal continuation as an outer ring road circumnscrbing the built up parts of the metropolis

100  Gardenvale—Ormond—East Oakleigh, &c.—
North-road extends directly east and west across the southern suburbs from the beach at Brighton to Dandenong-road, beyond which Wellington-road continues in the same direction to the Lysterfield Hills and the country beyond. It is one of the best east-west routes in the metropolis and will be one of the principal traffic routes. That part of North-road between Point Nepean-road and Crobie-road at Murrumbeena South, is already referred to in the description of Arterial Route No. 21 of which it forms part. The western section of the road is 132 feet wide, but its width diminishes at East Boundary-road to 66 feet, whilst east from Warrigal-road it gradually widens out again to 198 feet. The Commission’s scheme provides for a minimum of 132 feet. As long ago as December, 1923, the Commission urged upon the municipalities concerned the necessity for opening out the narrow portions of this road, and no further development should be permitted which conflicts with the preservation of a minimum width of 132 feet along this route

Reference to Plan—Sheet No.

14  11

Municipalities of Brighton (Part), Moorabbin, Dandenong (Part), Sandringham, and Mordialloc.

(Area south of North-road and within the area of planning of southern suburbs.)

Number.  Description of Route.  Reference to Plan—Sheet No.

101  Gardenvale—Middle Brighton—Brighton Beach—
New-street supplies a useful by-pass to the Foreshore-road (Arterial Route No. 22) and St. Kilda-street, and, as it is not incorporated in the tramway scheme, it is still more valuable as a main route for vehicular traffic. It joins the Foreshore-road between Brighton Beach and Hampton, and its northerly continuation has been described as Route No. 83

102  Gardenvale—Hampton—Sandringham (Picnic Point)
The continuation to the foreshore of Route No. 84 (Kooyong-road) via Hampton-street, makes a main route of considerable value for north-south traffic, and as a relief road for the Foreshore and Point Nepean-road arterial routes. Unfortunately, the conditions consequent in unsatisfactory planning, between the southern end of Kooyong-road and the northern end of Hampton-street, do not permit of the provision of the most suitable connexion except at great expense, but by cutting back the western corner of Kooyong and North roads, access from Kooyong-road into Clonaig-street is obtainable. Thence via the southern end of Milroy-street, with some improvements at the intersection of Milroy-street, Bay-street, and Point Nepean-road, a reasonably good route between Kooyong-road and Hampton-street can be secured. This route ends at the foreshore at Sandringham, thus providing a most serviceable through connexion, free from interference by tramway traffic, from the eastern suburbs of the metropolis to the beaches

103  Caulfield West—Moorabbin—Black Rock—
As a continuation southerly of Route No. 89 from North-road, Thomas-street is utilized to Point Nepean-road, and thence, in accordance with the Brighton Town Planning Scheme (see page 292), to join Bluff-road at South-road, following Bluff-road to the foreshore at Black Rock. The inclusion of this connecting link between Thomas-street and Bluff-road in future plans of subdivision would provide a valuable through route to a popular beach from a large residential area

12  13

12  13
Municipalities of Brighton (Part), Moorabbin, Dandenong (Part), Sandringham, and Mordialloc—continued.

<table>
<thead>
<tr>
<th>Number</th>
<th>Description of Route</th>
<th>Reference for Plan—Sheet No.</th>
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<tbody>
<tr>
<td>104</td>
<td>Brighton East to Brighton Beach— Were-street, Brighton, if continued easterly across the area of the Brighton Town Planning Scheme to join Route No. 103 would become an alternative main road to the beach from the southern suburbs, independent of tram and other main highways. Its usefulness is enhanced by the fact that Were-street is the only graded crossing over the electric railway in this part of the municipality of Brighton.</td>
<td>12</td>
</tr>
<tr>
<td>105</td>
<td>Middle Brighton—Bentleigh—Clayton, &amp;c.— Centre-road, which runs due east from Hampton-street, Middle Brighton, crosses many other main roads leading to the districts beyond the area of planning, and supplies, at the requisite interval, a parallel thoroughfare between North and South roads. It is already a well-defined main route, and its incorporation in the scheme is fully warranted</td>
<td>12, 11</td>
</tr>
<tr>
<td>106</td>
<td>Brighton Beach—Moorabbin—Springvale West— South-road is 132 feet wide from the foreshore at Green Point, Brighton Beach, easterly to East Boundary-road, whence it is reduced to 66 feet as far as Jack's-road. Between Clarinda and Clayton roads, further east, there is an existing 66-feet road in direct alinement with South-road. The Commission considers that South-road is so located that its development as a 132 feet continuous route to beyond Clayton-road is amply justified. As there are practically no buildings and very little subdivision along it at present, there should be no difficulty in securing the desired width. The connexions proposed with other cross suburban and ring roads in these sparsely settled areas all feed into South-road or its easterly extensions, and in due time such a route would be of great value.</td>
<td>12</td>
</tr>
<tr>
<td>107</td>
<td>Ormond—Highton—Beaumaris— Burke and Grange roads form a most important continuous north-south thoroughfare through the eastern and southern suburbs. Southerly from North-road, Grange-road (Route No. 88) connects into Jasper-road, but unfortunately the latter ends at South-road. This thorough route is extensively used at present, but traffic is required to pursue a devious course southerly from South-road, and it is obvious that the difficulties to be met as development proceeds will demand improvement. It is proposed that Jasper-road be continued southerly across South-road as shown on the plan, crossing Point Nepean-road almost at right angles to join Worthing-road and then Donald-street, both of which should be widened to 66 feet. This would permit traffic to reach Point Nepean-road without using the South-road level crossing, would by-pass the narrow shopping thoroughfare immediately east of Moorabbin Railway Station, and would avoid the diversion of a large volume of traffic into a short length of Point Nepean-road. It is then proposed that Donald-street be linked with Reserve-road, thus terminating this most important route at the foreshore at Rickett's Point, Beaumaris.</td>
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</tr>
<tr>
<td>108</td>
<td>Murrumbeena South to Highton and Heatherton— East Boundary-road, which is 132 feet wide, although not in direct north-south alinement with Murrumbeena-road (Route No. 90), supplies, in conjunction with it, another suitably located main route leading from a large residential neighbourhood to the Point Nepean arterial route and to the beaches. From the southern end of East Boundary-road at South-road it is proposed to continue the 132-foot road south-westerly across unsubdivided lands to join Point Nepean-road (Arterial Route No. 20) at Highton. Another branch of East Boundary-road is also proposed across unsubdivided lands to join Moorabbin-road at its intersection with Kingston-road, Heatherton, this branch route giving direct access via Route No. 110 to the foreshore at Mentone, and via Route No. 115 to Dandenong-road at Noble Park.</td>
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<tr>
<td>109</td>
<td>Oakleigh to Bentleigh and Highton— As practically the whole of the land between Warrigal and East Boundary roads is unsubdivided, the Commission planned a 66 feet diagonal road across this area from the intersection of Warrigal and North-roads to the junction of Centre and East Boundary roads. By so doing, and by utilizing existing roads, and new ones included in this schedule, an excellent cross suburban artery is provided at no cost.</td>
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<tr>
<td>110</td>
<td>Oakleigh—Moorabbin East—Mentone— Warrigal and Moorabbin roads form a direct southerly continuation of Route No. 93 from Wattle Park leading to the beach between Mentone and Parkdale, passing the Heatherton Sanatorium and Mentone Racecourse. The importance of this road is already demonstrated by the amount of traffic using it, fully justifying its inclusion as a main route located at the correct interval from other north-south main routes.</td>
<td>11, 13</td>
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<tr>
<td>111</td>
<td>East Oakleigh—Heatherton—Mentone and Mordialloc— The outer suburban ring road which is planned as a continuous route around the metropolitan area, the northerly extensions of which are made up of Manningham, Elgar, Box Hill, and other roads, is continued to the foreshore southerly from North-road at</td>
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</table>
Municipalities of Brighton (Part), Moorabbin, Dandenong (Part), Sandringham, and Mordialloc—continued.

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<tr>
<th>Number</th>
<th>Description of Route</th>
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<tbody>
<tr>
<td>111</td>
<td>East Oakleigh—Heatherton—Mentone and Mordialloc—continued.</td>
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</tbody>
</table>

East Oakleigh Station via Victoria avenue (widened to 66 feet) and Clarinda-road, the latter being extended due south across unsubdivided and open country the whole way to Lower Dandenong-road. An existing street named McSwain-street, in the same alignment is then utilized for a few chairs. This street should be widened to the point of its intersection with Kertch-street. At this point the route to the foreshore divides, one branch leading to the south-west, and the other to the south-east, as follows:—

To the south-west via a new street in line with Imes-street (which skirts the northern boundary of the existing park on the east of Point Nepean-road) crossing the latter to join Parkers-road, Parkdale, and thus gaining access to the beach.

To the south-east via a new 66-feet road across unsubdivided lands to the northern extension of Chute-street, the portion of the latter north of Warren-street to be widened. Chute-street gives direct access to the foreshore and creek reserve at Mordialloc.

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<tr>
<th>Number</th>
<th>Description of Route</th>
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<tr>
<td>112</td>
<td>Main Outer Suburban Ring Road: Wheeler's Hill—Clarinda—Cheltenham North—Sandringham—</td>
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</tbody>
</table>

This circumferential road, as already defined, has been planned 100 feet wide. Between Ferntree Gully-road and Mordialloc, it is outside the area of planning, but having regard to existing conditions and the ease of its provision, the 100 feet width should be continued diagonally across the vacant lands of the southern suburbs to connect with Bay-road, Sandringham as follows:—From the circumferential route at Ferntree Gully-road at Wheeler's Hill south-westerly, crossing the intersection of Dandenong and North roads, hence 132 feet wide to the intersection of Old Dandenong-road, and the easterly extension of South-road, thence continuing south-westerly, 100 feet wide, to join Bay-road at Point Nepean-road (midway between Highett and Cheltenham). Bay-road is planned 100 feet wide as far west as Bluff-road, but the remainder of it, to the beach at Sandringham, is built up to such an extent that widening beyond its present width of 66 feet can hardly be justified. This route would intercept many other main routes, and its potential value is apparent.

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<th>Number</th>
<th>Description of Route</th>
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<tr>
<td>113</td>
<td>Springvale—Heatherton—Mentone—</td>
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</table>

Advantage has been taken of the sparse development to plan a new diagonal route to serve the large area between the main outer suburban ring road (Route No. 112) and the circumferential road. Commencing at the intersection of Dandenong and Centre roads at Springvale, a 66-feet road has been located south-westerly across the Dandenong Railway and Arterial Route No. 21, to join Moorabbin-road at the municipal boundary between Moorabbin and Mordialloc.

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<tr>
<td>114</td>
<td>Brighton East to Foreshore at Mentone—</td>
</tr>
</tbody>
</table>

A new road, 100 feet wide, has been planned to link Beach-road, Mentone (Arterial Route No. 22) from near Charman-road with Bluff-road (Route No. 103) at Highett-road. This diagonal road is designed for local traffic, as well as to intercept the very heavy traffic along the Foreshore-road, thus easing the congestion in the Sandringham and Brighton portions of this popular highway. It would give more direct access to the main northerly routes, and being midway between the two south-eastern arterial routes, would become one of the most serviceable avenues of travel in this section of the metropolis. Access to the Point Nepean-road from the districts west of that part of the railway between Moorabbin and Mordialloc is only gained by crossing the railway on the level at various places. This road, which meets the Point Nepean-road via Beach-road at Mordialloc would, therefore, greatly minimize that cross-railway traffic. Although the country through which this route would pass is subdivided, it is not extensively built upon, and a large proportion of the adjacent lands is used as golf courses. The route has been carefully chosen and it is considered that steps should be taken to secure the road without delay and before the cost increases. For that reason it is included in the Urgent Works Recommendation (see Map No. 5).

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<tr>
<td>115</td>
<td>Highett—Heatherton—Noble Park—</td>
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</tbody>
</table>

Kingston-road, which extends from Dandenong-road at Noble Park to the junction of Warriegal and Moorabbin roads, if extended westerly along the same alignment would join Highett-road at Point Nepean-road. The land through which this extension would pass is not yet subdivided, so that it could be easily secured. Being located midway between the South-road and Centre Dandenong-road routes, it would supply the east-west main road requirements in this neighbourhood, whilst it has the advantage over the other routes referred to of existing access to Dandenong-road.

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<tr>
<td>116</td>
<td>Cheltenham to Dinghy—</td>
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</tbody>
</table>

Centre Dandenong-road connects Arterial Routes Nos. 20 and 21, and fulfils a useful purpose by forming portion of an alternative route between the southern suburbs and Dandenong. It is a well constructed level road, and at the present time is the only direct connexion between Point Nepean-road and Old Dandenong-road. It is a valuable feeder route to Point Nepean-road and the Cheltenham Railway Station.
Cheltenham to Beaumaris Bay—
Charman-road offers a direct route from Point Nepean-road to Beaumaris Bay, and is likely to be used extensively by beach and other traffic. It would also act as a valuable feeder route to the Cheltenham Railway Station, and to Point Nepean-road, thus connecting the two arterial routes which pass through this neighbourhood, and which carry such large volumes of tourist traffic.

Circumferential Route: Wheeler's Hill—Dingley—Mordialloc—
Existing thoroughfares outside the area of planning have permitted a route to be planned to continue the circumferential route last dealt with as Route No. 99, southerly from Ferntree Gully-road. From Ferntree Gully-road a 56-feet road is proposed to run southerly about midway between Springvale and May's roads to connect with an existing north-south road linking North and Dandenong roads. Thence the route follows a short new link into existing roads which cross the railway between Clayton and Springvale (see Map No. 4), and eventually connects with Centre Dandenong-road at the Old Dandenong-road. From this point a further new link is recommended, crossing Lower Dandenong-road at Boundary-road, and finally joining and utilizing Chute-street at Mordialloc at the same point as Route No. 111. This would complete a ring road of great value encircling the metropolis, and which can be obtained in the course of subdivisional development.

Port Melbourne to Williamstown—
In its First Report (page 48), the Commission submitted a recommendation for the provision of a new road from Port Melbourne to Williamstown by the incorporation in the harbour scheme of development of a 198-feet road, leading from the Melbourne to Port Melbourne Highway at Graham-street, approximately along the line of the outfall sewer reservation westwards, and thence south-westerly across the area of 197 acres, which the Melbourne Harbor Trust Commissioners were reclaiming. From a point sufficiently far along this new reclamation to allow of proper grading, it was recommended that a tunnel or tunnels should be built to continue this road for nearly a mile under the mouth of the River Yarra, and emerging in Williamstown territory, at the intersection of Stevedore-street and Douglas-parade. Practically no resumptions of property would be necessary for this work, and the Melbourne Harbor Trust Commissioners are favorable to the scheme. Subsequent works should be designed with the tunnel project in view, so that its ultimate accomplishment will not be unnecessarily costly, when its construction is rendered expedient.

Melbourne—South Melbourne—Port Melbourne Beach—
The Melbourne-Port Melbourne Highway will serve a very definite purpose. Bay-street, Port Melbourne, is a tramway and business thoroughfare serving the most densely peopled part of this industrial area. It is, therefore, proposed that the main vehicular traffic route from the City to serve this locality be defined as Queen's Bridge-street (59 feet wide), City-road (59 feet wide), and Pickles-street (66 feet wide). Pickles-street is midway between the proposed Port Melbourne Highway and Albert and Kerferd roads.

Melbourne and South Yarra to Albert Park Beach—
Albert-road and Kerferd-road (108 feet wide) supply an important and suitably located roadway route connecting the beaches with Toorak-road and eastern suburbs, as well as the St. Kilda-road outlet from the City. Albert-road is the northern boundary of the very large Albert Park reservation which will continue to become increasingly popular as a recreation area.

West Melbourne to South Yarra via Hanna-street—
The construction of Batman Bridge, which is now proceeding, to connect Spencer-street, Melbourne, with Clarendon-street, South Melbourne, brings into greater prominence the recommendations which have been made by various authorities, for many years past, for the improvement of the Hanna-street approach to the city proper. The Commission
submitted a scheme including estimates of costs, &c., in its First Report, for connecting Hanna-street, with Clarendon-street by a 99-feet road from Whiteman-street to City-road. Full details were also submitted for widening and improving Roy-street, which is the southern and natural outlet of Hanna-street into and across St. Kilda-road to connect with Toorak-road (Route No. 80). The Commission and the South Melbourne Council have advised successive Governments that the full value of the new bridge cannot be realized until this scheme is given effect to. It is again included in the schedule of urgent works in this Report, and the Commission again desires to emphasize, without, however, repeating what has been written and expressed so frequently, that this is one of the most urgent proposals awaiting the attention of a proper central authority.

Some further facts deduced from the traffic census of December, 1926, however, may be quoted in support of this scheme. In twelve hours 5,786 vehicles passed between the suburbs west of the Yarra and the Moonee Ponds Creek, and the suburbs south of the Yarra and Toorak-road. In addition, a considerable volume of traffic between the southern and south-eastern suburbs entered and left the city via Prince's and Queen's Bridges, for which the Hanna-street route would have been more convenient. As the actual "city" destinations and origins were not recorded in the census, figures of this traffic are not available. The encouragement to traffic that would be given by the direct linking of Toorak and St. Kilda roads with Spencer-street, via Hanna-street, would very greatly reduce the volume of traffic which converges on Prince's and Queen's Bridges, and in the busiest city streets. Traffic to and from the western suburbs, and the western end of the city, and the eastern suburbs, would find this a more satisfactory route.

In connexion with this route, and more particularly with regard to Batman Bridge, the Chief Engineer of Railway Construction, as the constructing authority for that structure, requested this Commission, when the plans of the bridge and approaches were under consideration, to express its opinion on them. As a result of the negotiations, provision has been made for the construction of an "island" to enforce gyratory traffic movement at the southern bridgehead.
Municipalities of Port Melbourne, South Melbourne, and St. Kilda (Part)—continued.

<table>
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<tr>
<th>Number</th>
<th>Description of Route</th>
<th>Reference to Plan-Sheet No.</th>
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<tbody>
<tr>
<td>123</td>
<td>King-street Bridge and Extension to Hanna-street—</td>
<td>1</td>
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<td></td>
<td>Future development will necessitate the provision of bridges across the Yarra in the western end of the city proper in line with each north-south street, and a bridge at King-street was included in the First Report recommendations for that reason. It is also proposed that King-street be continued southerly to join Hanna-street in accordance with the scheme outlined in the First Report (page 34). It is recommended that steps be taken under a Town Planning Act to ensure that no new buildings or work of permanent nature be permitted in future which will render more difficult or costly the ultimate provision of this new outlet from the city.</td>
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<tr>
<td>124</td>
<td>William-street Bridge and Power-street to St. Kilda-road—</td>
<td>1</td>
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<td>The construction of a bridge over the Yarra at the foot of William-street has been advocated for a long time by various authorities, including this Commission. Consequent on the closing of the wharfs, east of Spencer-street, as a result of the passing of the Spencer-street Bridge Act 1927, the difficulty with shipping no longer exists. In its First Report this Commission pointed out (page 33) the advantages of a bridge on the alinement of William-street, and it was recommended that the 99 feet of roadway should be continued directly across Queen's Bridge-street so as to give access to Power-street, which in turn would supply routes to Hanna-street (via Moore-street) and to St. Kilda-road (via Grant-street). The desirability of carrying out the Commission's original recommendation has been confirmed by subsequent traffic developments.</td>
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<tr>
<td>125</td>
<td>Queen-street Bridge and Moore-street, South Melbourne, Improvement Scheme—</td>
<td>1</td>
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<td>The proposal submitted by the Commission in its First Report (page 34) in this regard was as follows, and is conditional on the removal of the St. Kilda and Port Melbourne Railway lines to cross the Yarra west of Clarendon-street—</td>
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<td>Subway to be built under railway viaduct opposite Queen-street Bridge on same alinement as Queen-street and the proposed subway to cross the Yarra to Riverside-avenue</td>
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<td></td>
<td>Continuation of Queen-street over Riverside-avenue City-road and Kavanagh-street to join Moore-street by cutting through existing, but very poor class properties, and remodelling on the adjacent area.</td>
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<td></td>
<td>Widening to 99 feet of Moore-street on western side to its junction with Hanna-street. Much of the property affected, especially in Moore-street, is Crown leasehold, and the setting back and other adjustments could be secured when leases came up for renewal.</td>
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<td>The Commission admits that there is no justification for urgency in the development of this route which would entail heavy expenditure, but it would ultimately be of benefit because it supplies an additional city outlet, thereby relieving the turning traffic problem in the city proper and gives convenient access to the Port Melbourne and western districts highways, to South Melbourne via City-road and York-street, and into the Hanna-street main route to St. Kilda and Toorak roads. It is recommended that the Lands Department and other authorities concerned should take every opportunity to secure gradually the widening of Moore-street, and prevent new construction which is likely to render the ultimate accomplishment of the scheme more difficult.</td>
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<tr>
<td>126</td>
<td>Foreshore Boulevard—Port Melbourne to Point Ormond and beyond—</td>
<td>1</td>
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<tr>
<td></td>
<td>It is extremely fortunate that in the planning of the foreshore suburbs of Port Melbourne, South Melbourne, and St. Kilda municipalities, a wide foreshore boulevard was provided for. Beaconsfield-parade, which extends from the proposed Melbourne-Port Melbourne Highway to Fitzroy-street at St. Kilda, is continued at St. Kilda as The Esplanade (both Upper and Lower), and then from Carlisle-street as Marine-parade to Point Ormond where Arterial Route No. 22 (the Foreshore Boulevard at Mordialloc and beyond) is joined. This Esplanade route, with the Port Melbourne Highway scheme achieved, would be an extremely popular traffic way and a delightful drive.</td>
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PARKWAYS.

THEIR RELATIONSHIP TO THE MAIN ROADS SCHEME.

In addition to the arterial and main roads described in the preceding pages, the Commission has planned a series of parkways in the metropolitan area. Although these routes are referred to more fully in Part V., mention must be made of their bearing on the General Roads Scheme, and of their usefulness from a traffic circulating point of view. The Commission’s scheme for a park system for the metropolis aims at the utilization of the comparatively cheap and open lands along the valleys of the streams. The location of these watercourses is such that roads
planned to separate the park lands along them from the residential development form a series of radiating and picturesque drives between the inner and outer suburbs. The roads proposed to fringe the various creek and river parks are clearly shown on the Sheet Plans.

The provision of these parkways will increase enormously the capacity of the metropolitan road system defined on Map No. 4. They would form many valuable intercepting roads, giving added facilities to cross-suburban traffic, and allowing light traffic to avoid points of congestion in the event of the main roads ever becoming taxed beyond their comfortable carrying capacity. In certain cases, sections of these parkways have been incorporated in the defined arterial and main routes.

In addition to the use of these parkways for light traffic, they will afford a means of removing the undesirable conditions created by the unco-ordinated subdivision of land in the vicinity of the streams, which has resulted in a disjointed and unsuitable street system.

As an example of the value of these parkways, planned as an aid to the general roads scheme, attention is drawn to the route which would be provided between Sydney-road, North Coburg, and Dandenong-road, west of Oakleigh, by the conjoined use of the parkways along the Merri Creek, a part of the River Yarra, and Gardiner’s Creek. The roads provide a continuous parkway which would be a valuable City by-pass route, actually shorter between North Coburg and Oakleigh than the present generally used routes, and avoiding the increasing congestion in Sydney-road, Swanston-street, Wellington-street, &c.

Most cities have some particular street or streets of which the community is proud. It will be noticed on reflection that, in almost every instance, this pride arises from the fact that the thoroughfare concerned is wide, and has its traffic ways segregated by belts of trees or other plantation reserves. By taking prompt action, Melbourne is able to ensure the development of a system of parkways, including its delightful foreshore roads, at very little cost, which will compare most favorably with those of any City, preplanned or otherwise.
Alexandra-parade, Fitzroy. Portion of an existing parkway through industrial and "C" class residential areas.

Beaconsfield-parade, South Melbourne. Showing portion of an existing foreshore parkway.
IMPORTANT FACTORS OF ROADS IMPROVEMENT SCHEME.

The road communications defined in preceding pages, and shown in detail on Map No. 4, and the fifteen sheet plans accompanying this Report form a programme of road development for the area covered by the zoning scheme. Within this area it is estimated that a population of over 3,500,000 can be provided with housing accommodation, business, and industrial sites and open spaces for recreational use.

It is difficult to foresee the changes that will take place in methods of transportation, and the volume of traffic that the roads will be called upon to accommodate. Nevertheless, by means of traffic counts and analyses of the traffic producing capacity of the districts of different types within the metropolitan area, the Commission has been to some trouble to inform itself of the probable future traffic developments. The Commission considers that, after a most careful review of all the circumstances, the road scheme it has outlined embraces the means of giving economically a substantial and permanent relief to all thoroughfares at present congested, and to others which must become congested if relief measures are not forthcoming. The system defined is elastic, and a critical examination will show that, in the event of any one section becoming over-burdened, satisfactory avenues would be available for by-passing or re-routing traffic to avoid the affected area.

The Commission has explained in various parts of this Report that considerable progress has already been made in the outer areas in securing instalments of the improvements recommended. It is confidently asserted that by the enactment and proper administration of town planning legislation, giving powers asked for by this Commission, a considerable part of the road and parkway schemes will be secured gradually in the ordinary course of development as component parts of that development, and at no cost to the community.

While it may be necessary ultimately to widen streets in addition to those recommended in the general main roads scheme, or to create new routes in the future, the proposals outlined, if carried out systematically in their order of urgency, will extend appreciably the time when such additional works would have to be commenced. The Commission's schemes aim at rendering unnecessary the widening of streets which could only be carried out at very great cost. It presents, as alternatives, schemes utilizing the most economical avenues offered by the existing conditions of metropolitan development, schemes which can be carried out at a fraction of the cost of any involving extensive widening of existing busy thoroughfares.

The Commission has submitted proposals for certain street widenings and new routes in this Report, because no satisfactory alternative could be found which would achieve similar results, and it would not be wise to delay their commencement unnecessarily. Those works which the Commission considers are of a specially urgent nature have been dealt with separately under Part III., where proposals for financing them are set forth.

The Act of Parliament under which the Commission operates instructs that estimates, in reasonable detail, should be supplied of all improvements recommended. So far as the urgent works are concerned, the Commission has complied with this provision in the Act. Having regard to the fact that the greater proportion of the general scheme would be carried out over a long period, largely by the administration of a Town Planning Act, and as methods, costs of labour and materials, and developments in the neighbourhoods concerned would be subject to considerable change, it is considered that estimates of the costs of works that would not be put in hand for some years would be of little or no value. Means for preventing these schemes from becoming more costly in the intervening years are explained in Part III., dealing with Urgent Works, and in Part X., which sets out the legislative requirements.

TRAFFIC CONTROL AND REGULATION.

In its First Report, the Commission made reference to traffic regulations, and some of the recommendations made at that time have since been adopted. It is considered that the achievement of a scheme of development, on the lines laid down in this Report, would do much to facilitate the free and safe movement of traffic of all kinds, including its improved regulation, whether controlled or otherwise, and further, that it would delay the time when stringent regulations will need to be enforced. The traffic authorities—municipal, police, and tramway—have taken in hand, earnestly, the question of improved traffic facilities so as to make more efficient use of the existing street system. A certain amount of co-ordination of effort has been practised.
with beneficial results to all concerned. There is no doubt that traffic regulations are required to obtain the greatest degree of efficiency and safety in any street system. Progressive improvements, both in the regulations and the street system, become necessary, but neither should be developed at the expense of the other. Each improvement should be of such a character as to secure the maximum of freedom and safety of movement.

Uniformity in Traffic Regulation.

With the multiplicity of executive authorities in this metropolis, it frequently happens that the methods of traffic regulation vary considerably in different municipal districts. The first essential to the proper regulation of traffic is to secure uniform by-laws, street signs and markings, and methods of observance. The Commission believes that the only satisfactory way of achieving this is by the appointment of a central governing authority for the metropolitan area, or the appointment of some authority with overriding powers in all matters of this kind. A recommendation in this regard is made on page 143.

In order that drivers of vehicles may be kept informed of traffic rules, it is recommended that the regulations be consolidated and kept up to date in printed form and issued free with the annual licence renewal. The booklet should be of convenient pocket size. Press announcements of changes should also be made as required.

The Right of Way at Intersections.

The necessity for the adoption of rules governing the movement of vehicles at and across intersections is obvious, but in a large metropolis where so many different types of street intersections exist, and where the volume of traffic on the intersecting streets is so variable, many simple rules cannot be applied satisfactorily over the whole area. It is apparent that no general formula can be devised to meet all conditions, but it is believed that if a general system of roadways such as is now recommended were adopted, whereby vehicles on certain routes would have the right of way over those on other routes, improved conditions would be established in a short period. The immediate application of rules to the existing conditions could be made with the knowledge of improvements to follow, so that they would not be subject to change when such improvements took place.

The question of rights-of-way has been considered in relation to the general roads scheme, and the Commission has concluded that some method of denoting to drivers of vehicles the importance of the street, in which they are travelling, with relation to a cross street which they are approaching, so far as the right of way is concerned, is the only satisfactory method of ensuring safety and uniformity.

A scheme should be devised so that traffic on any defined arterial route will have precedence over all other traffic, where control is not in operation by Signals. Subject only to the arterial routes, the traffic on all defined main routes should have the right of way over all other intercepted thoroughfares. Drivers, however, could not be expected to know or to memorize the relative values placed on all the thoroughfares of the metropolis by the responsible authority. In such a system of roadways such as is now recommended, whereby vehicles on certain routes would have the right of way over those on other routes, improved conditions would be established in a short period. The immediate application of rules to the existing conditions could be made with the knowledge of improvements to follow, so that they would not be subject to change when such improvements took place.

The methods adopted by many other cities in giving effect to such a scheme, have been studied. It is recommended that, as all streets are lighted, particularly at crossings, the standards supporting the lights and the lights themselves should be used for the attachment of distinguishing marks of uniform design. The posts might have a neat coloured band painted on or attached them for daylight observation, whilst a similarly coloured band could be painted on the light used as a reflector in the same way as now obtains to denote tramway stopping places. These marks should be placed at all intersections. It is preferable that red colours be used on the signs of secondary road to indicate to a driver that he is approaching a major thoroughfare. This would operate without difficulty, so far as the approach streets to the arterial road are concerned, because all cross or intercepting streets would be inferior in importance. In a great majority of other cases there should also be little difficulty in distinguishing the relative importance of the streets; but where two defined main routes or where all other ordinary roads cross or meet each other, the authority would define the route on which the right of way is given.

The indication on the highway in white paint or by bright metal studs of such words as "Stop," "Slow," &c., would also be an effective method of warning.
The Commission considers that it is essential that any scheme propounded should be uniformly adopted and gradually developed.

Prohibitions of Turning Traffic.

The Melbourne City Council has found it necessary to make frequent extensions to the restrictions in respect to the turning of traffic into and out of Swanston-street from the streets running east and west across it. It is clear from a study of the traffic censuses that these restrictions have caused much traffic to follow other routes. The opening of Batman-bridge, which is to connect Spencer and Clarendon streets, will assist traffic in crossing the Yarra, but, as stated elsewhere, the full effect of that outlet will never be realized until its southern approaches are perfected.

The regulation whereby right and left hand turns are prohibited is not as attractive as appears at first sight, for, though the movement of vehicles is freer in the streets which it is designed to assist, its effect is to cause large numbers of vehicles to travel longer distances and, in many instances, for much longer lengths through the street which the regulations intended should be avoided. The first prohibition of turning to the right in Swanston-street, Melbourne, commenced at the Flinders-street and Collins-street intersections as from 10th July, 1924. Whilst this facilitated traffic in Swanston-street at those intersections, its operation had the effect of causing obstruction at the next northerly crossing, at Bourke-street, so that the operation of the regulation was extended northerly over Bourke and Lonsdale streets on 12th October, 1925, thus making Latrobe-street the first crossing of Swanston-street northerly from Prince’s-bridge at which right-hand turning is permissible during busy hours. This is half a mile distant from the bridge.

The Commission recognizes that, in the present circumstances, the greatest need has been to secure the maximum flow of traffic in Swanston-street, which is the only direct through route from north to south across the City, and which street is required to receive into 99 feet between building lines the outpourings of an attractive 198-feet road. It is, however, the opinion of the Commission that by carrying out its recommendations, particularly those for City by-pass routes, further restrictions will be unnecessary for many years, whilst some of the existing regulations might be removed.

Notwithstanding the present necessity for prohibiting turning traffic at some intersections of Swanston-street, it is certainly desirable to facilitate, to a greater degree than is now permitted, the turning traffic at less busy intersections.

Dangerous Curves, Subways, etc.

In a number of instances the municipalities have had lines marked on roadways at dangerous curves, awkward intersections, under subways, &c, to indicate to drivers the lanes and directions of travel. At many such points throughout the State, flashing beacons have been erected, and there is no doubt of their great value.

Slow and Heavy Traffic.

In 198 feet roads the diagram of cross-sections, as recommended on page 61, makes provision for separate roadways for slow and heavy traffic. This segregation cannot be achieved, however, in roads of appreciably less width. It is important that slow and heavy traffic be compelled to keep as close as possible to the kerb, so as to allow the faster and lighter vehicles, which comprise the larger proportion, to move more rapidly than a horse-drawn or other slow-moving vehicle. The latter class of traffic should also not be permitted to pass along any thoroughfare two or more vehicles abreast.

One-Way Roads.

In wide roads, where plantation strips separate the roadways, or where streets are wide enough to permit of it being done, it is most desirable that the side roadways be used for one-way traffic only. One-way avenues of travel are a great benefit. Even though the actual area of the one-way street may be less than the area of half a road where there is two-way movement, its capacity is increased by reason of the lesser conflict obtaining. With all vehicles going the same way, passing is safer and easier, speed is invited with safety, the intersection problem is greatly simplified because of the 50 per cent. reduction in turning traffic, and pedestrians have only one line of movement to contend with. The plans of the Commission make provision for wide roads wherever practicable, and the segregation of roadways by plantations in roads 99 feet wide or wider has been advocated.
One-way traffic rules could also be applied to narrow thoroughfares, especially where they are paralleled by other streets. The Melbourne City Council has declared the “little” streets as one-way routes, and greatly improved movement along them has replaced the chaos which previously existed. The illustration on page 55 of the parking of vehicles in Little Flinders-street shows the orderly conditions of the traffic in that one-way street.

It may become necessary to declare certain approach streets near the central business area as one-way roads for “inward” traffic during certain hours of peak loading in the morning, and similarly for “outward” traffic in the evenings. In such cases, and also in narrow thoroughfares, any regulations as to one-way movement should be conspicuously indicated at suitable places, as a warning to drivers.

**SAFETY ZONES.**

As a means of reducing vehicular and pedestrian conflict, the safety zone is of considerable value and is most necessary at tramway stopping places in congested areas. Several types of safety zones are being used in this City, and illustrations of two of them appear below:

![The raised and railed safety zone with beacon now being more generally constructed in the City business area.](image1)

![The paint line zone as used at less congested points.](image2)
The type of safety zone illustrated which is not raised, or at least elevated at the end facing oncoming traffic, is regarded as dangerous. People locating themselves on such zones are liable to have a false sense of security, especially at night. It is considered most important, wherever the traffic warrants the provision of safety zones, that they should be of the raised and solid type, at least at the end facing onward vehicular traffic, where a distinguishing light should be erected. At night, and on wet streets, a weak or inconspicuous light may be indistinguishable, and it is at night that the greater danger exists so far as the tram passenger is concerned.

In roads wide enough to allow of plantation strips to separate the roadways, safety zones are automatically incorporated, and an extension of thoroughfares of this class will be brought about if the recommendations in the Commission's road scheme are carried out.

**Automatic Traffic Signals.**

At intersections where a number of roads meet and cross, the Commission has made suggestions for their more efficient operation by gyratory or rotary movements (see page 127).

At intersections where the traffic is heavy and continuous, and where only two routes directly cross each other, automatic signalling has proved advantageous, and there is little doubt that this system is capable of extension with even more satisfactory results.

The Commission is of the opinion that wherever automatic signalling is installed it should make provision for an amber light to denote imminent change of direction. This halt between the "Stop" and "Go" signals gives pedestrians the opportunity of clearing the crossing before the halted vehicular traffic moves on. It is essential that both vehicular and pedestrian traffic should be compelled to observe the rule that immediately the green light changes to amber, all further movement across the intersection from that direction must be confined only to those who are actually crossing at the time the change is signalled. Likewise, traffic on the opposite road should not commence to move across the intersection until the green light appears.

These automatic three-light signals have been installed recently in Swanston-street, Melbourne, but their success would be much greater if this interpretation of the "amber" light were more rigidly enforced. The Police Department has expressed certain objections to the system of automatic signalling, but it is the opinion of the Commission that any disadvantages it possesses are much less than those of manual control. Most of the difficulties at first encountered have been overcome by the greater experience gained. It is considered that definite regulations, governing the passage of vehicles and pedestrians past regulated points, and education of the public by more experience and extensions of the system, will overcome almost every objection.

Where all streets run at right angles and where the flow of traffic along a particular street and its cross streets is reasonably evenly balanced, a synchronization of the traffic control signals throughout the principal street has great advantages. Instead of the clearance being given only from block to block with each intersection operating independently, a much greater volume of traffic could be handled expeditiously by synchronized control and by the traffic maintaining a reasonable and even speed. The Commission supports the development of this form of traffic regulation, and considers that when more parallel routes of flow are provided by the construction of additional bridges, an extension of this system will increase greatly the traffic capacity of the existing streets.

Unless there is an approximately similar volume of traffic in the respective streets at the intersections where synchronized signals are to operate, it would not be wise to install them. Where there is large variation in the traffic volume on the cross streets, synchronized signalling would cause unnecessary delays to the traffic, because the fixed time cycle would not coincide with the differing quantity of traffic desiring to cross or connect with the main thoroughfare. The Commission favours the automatic signal installations being located on each corner kerb, as adopted by the Melbourne City Council.

At an intersection equipped with light signals, where the traffic is heavy and the flow is uneven, the alteration of the lights by a traffic officer in an elevated position, with a view in all directions, will save considerable delay.

In cities which have adopted a successful system of automatic signalling, the numbers of police engaged on traffic duty have been reduced, and the men utilized on patrol or entirely different police work, thereby assisting to offset the cost of installing the machines.
SPEED OF VEHICLES.

One of the most debatable aspects of traffic regulation is that of speed. Whereas in many cities, especially in America, traffic officials are endeavouring to prevent slow movement through busy streets, most cities have prescribed limitations. Although the question of speed is a matter of concern in road construction by reason of the damage caused by excessive speeds, it has also to be considered in relation to safety and congestion. In thoroughfares where frequent points of control are maintained, the rate of movement is likely to be reduced. This results in the banking up of traffic. If greater speeds were possible in these streets, their capacity would be increased considerably. It is contended by many that with modern brakes, and by more efficient control over the issue of drivers' licences, as recommended elsewhere (subject to any necessary restrictions from the point of road surface protection), there should be no defined maximum, but that the regulations should be based on a speed compatible with safety, the responsibility being placed on drivers to prove in the event of accident that their speed was safe. Any fixed rule for speeds are rendered less necessary by the improvements which are being continually made to motor vehicles.

Varying regulations limiting the speed of vehicles are in operation in different parts of the metropolitan area, and are intended to ensure greater safety in congested or dangerous streets. The Commission is of the opinion that within the 10-mile radius of Melbourne a speed greater than 25 miles an hour should not be permitted. This restriction could be extended beyond the 10-mile radius where local conditions were such as to warrant its adoption.

PASSING STATIONARY TRAM CARS.

The municipalities of this metropolis have debated individually and collectively, from time to time, the question of prohibiting vehicles from passing stationary tram cars, and in several instances regulations to this effect have been instituted. The regulations issued by the Governor in Council under the authority of the Motor Car Act 1915 provide, inter alia—

" 3. (a) . . . In passing a tram car proceeding in the same direction he shall keep the motor car on the left or near side of such tram car as close to the kerb or gutter as is practicable . . .

3. (b) The driver of any motor car . . . overtaking any such tram car which is about to stop or is stationary for the purpose of allowing passengers to alight or for any other reason, shall reduce the rate of motion of the motor to a speed so low that he may be in a position to stop the car immediately in case of sudden danger, and shall not increase such speed until he has passed a reasonable distance beyond such tram car."

The Commission considers that these provisions, if observed and enforced, are more satisfactory than the regulation which prohibits any vehicle from passing a stationary tram in any circumstances.

It has been stated in earlier pages that the Commission's plans provide for arterial and main roads to be independent of tramway routes as far as possible, or else for the tramway routes to be wide enough to allow of the "parking" of the trams. Wherever practicable, tramway routes in streets less than 84 feet wide have been avoided. The strict observance of the Governor in Council's regulations should have the desirable effect of discouraging through traffic from using the narrower tramway thoroughfares and of diverting other than local traffic into the paralleling main routes.

Where trams have been placed in special reserves, and where raised safety zones exist, the regulation of vehicular traffic in relation to tramway stops does not apply.

REGULATIONS AS TO LOADING AND UNLOADING OF VEHICLES.

Of all classes of standing vehicles, those that are stationary at the kerbs for the actual purpose of taking up or setting down passengers, or transferring goods, should be given the greatest measure of preference. Nevertheless, there are certain places where the stopping of vehicles for any purpose must be prohibited during certain hours. In many cities, it has been found necessary to regulate the hours at which the loading and unloading of goods can be permitted at the more important corners and in main thoroughfares. The Commission believes that a gradual application and extension of this form of regulation will become necessary in important business centres. In view of the probable serious interferences that may be occasioned to the commercial interests, any such regulations must be justified by the still greater necessity for a clear thoroughfare.
No doubt the ultimate solution of the loading and unloading problem is by the use of lanes or the establishment of loading docks within building lines. In new large premises on very important thoroughfares, steps should be taken to insist on some provision being made in this regard.

"The additional facility with which such transfers can be made within the buildings, and the release of street and sidewalk space for potential customers should, to a large degree, compensate the occupants of buildings for the cost of interior drives and loading platforms." (Miller McClintock, in Street Traffic Control, page 156.)

**Advertising Vehicles and Distractions.**

Excepting in authorized processions, the streets which are intended for transportation purposes should not be used by vehicles or persons merely for publicity. Such vehicles in most cases move slowly in order to secure the greatest attention, and in so doing obstruct the more important elements of the traffic stream. Moreover, they create a nuisance by reason of the fact that the attention of drivers and pedestrians is distracted, often with serious consequences. The City of Cleveland in America operates a by-law which says—

"The driving of vehicles to and fro upon the public highways within the city for the sole purpose of advertising is hereby declared to be a nuisance and unlawful."

The Commission considers that this is both reasonable and desirable.

**Bells, Horns, etc.**

The Commission recommends that the use of bells on any other than authorized vehicles, such as trams, fire and ambulance vehicles, &c., should be prohibited. By the limitation of the use of bells to urgent services, the public and the police would know at once that the right of way must be given to vehicles so equipped.

Occasionally some irresponsible person appears on the streets with some screeching or peculiar sounding instrument in place of the customary motor horn. This is offensive, and may be dangerous, and the police should have power to stop these nuisances immediately they appear.

**Drivers’ Licences.**

The human element is the most important in the whole field of traffic regulation. It is therefore a matter for regret that the licence given to people to drive vehicles is not made of much greater value, not only in regard to its issue, but in its withdrawal in cases of serious offences. If that small proportion but not inconsiderable number of drivers, who are inclined to recklessness, knew that there was a distinct likelihood of their licences being cancelled, if only for a year or two, there is no doubt that they would exercise more care.

At present no person can obtain a licence until it has been shown to the satisfaction of the Police Department that he or she is capable of handling a motor vehicle reasonably well. The Commission considers that this examination is not sufficiently stringent, and that an investigation into the physical attributes of the applicant is of no less importance and should be carried out before the licence is granted. A person may be able to satisfy completely the inspecting constable as to his fitness to drive a vehicle, but the same person may have defective eyesight or hearing, may be subject to fits, or be mentally, physically, or in some other way incapacitated.

Another serious omission in our present laws is that a person who obtains a licence does not have to appear before the authorities again in securing annual renewals. It is obvious that, although at the time the licence was first granted the person may have suffered no disability, his or her fitness to continue driving must depend upon a maintenance of that condition. It may be unreasonable to require reconsideration of all cases annually, but a triennial period could not be regarded as unduly short in the interests of public safety.

Sir Henry Segrave, who recently visited Berlin, where very severe tests are made of all potential motor drivers, has asserted that the standard of driving is excellent, and that its traffic is managed better than in any other city in the world. He wrote as follows:—

"The candidate has to pass a stiff examination in traffic regulations and the rule of the road. The car is provided by the Government Department concerned. One part of the test is high-speed driving. An official sits by the candidate and insists on a burst of high speed, and watches to see if the driver can judge his distances when pulling up,
An elementary knowledge of the mechanism is also required. The official puts the car wrong and asks the driver to put it right. The result is that every beginner starts on the road with a reasonable knowledge of how to drive, road courtesy, and traffic rules.

**Pedestrian Congestion in Precincts of Flinders-street Station.**

In its First Report (page 14) the Commission expressed its disapproval of the various schemes, which had been advanced from time to time, for the construction of subways under Flinders-street to give pedestrians direct and safe access into the Flinders-street Railway Station. A scheme was submitted, and strongly recommended by the Commission, which provided for the construction of additional bridges over the River Yarra, and for a wide road parallel to Flinders-street on the south side of the river. Further studies and additional data have emphasized the Commission’s view that the greatest need at this congested centre is to supply facilities elsewhere which will attract away from this point much of the traffic which is now compelled to pass it. The Commission has also examined proposals for the undergrounding of Flinders-street so that it may pass under Swanston-street. An analysis of the advantages and disadvantages of this scheme has convinced the Commission that such very expensive palliative works should only be undertaken when no other means of relief can be obtained. They are also liable to invite still greater concentrations of traffic, and thus nullify, very quickly, any advantages that might have been gained. It is believed that the carrying out of the Commission’s proposals for additional city railway stations and for additional roads and bridges will bring about the desired distribution of the traffic, and result in a reduction of the congestion now experienced in the precincts of the Flinders-street Railway Station.

**Road Crossing by Pedestrians.**

The increase in motor transport has necessitated the enforcement of restrictions upon the crossing of roads by pedestrians in business areas. Unless officials are permanently stationed at the kerbs of the sidewalks some difficulty is experienced in educating pedestrians to observe manual or automatic signals, and also to cross city streets only at the authorized places at regulated times. Where the left turn for vehicular traffic is allowed at busy intersections, vehicles must perform pass through the body of pedestrians who are crossing the road. It is not desirable that left-hand turning be prohibited or that a vehicle turning to the left should as a rule be required to stop before moving into the intersecting thoroughfare. Consequently there does not appear to be any really satisfactory way of overcoming the conflict that must occur between left-turning vehicles and those pedestrians for whom the road crossing is opened. The Commission considers that this conflict is not sufficiently serious to warrant the construction of expensive subways or elevated passageways, &c.

The “jay walker” is, however, the cause of much trouble. Drivers, in avoiding pedestrians who appear on the road at unauthorized places, are forced to swerve and thereby possibly foul some other vehicle. It is not reasonable to expect the motorist to maintain a fair rate of movement and at the same time to be compelled to weave a devious route through transgressing pedestrians. It is not only the crossing of streets at wrong places, but their failure to observe the signals, and wait their turn to cross at the proper time and place. The consequent hold up of traffic, at the moment when it is most important that it should have every facility for rapid clearance, is a matter of increasing concern. Another fault is the crowding on to the roadways while waiting for the traffic signal. This causes a reduction in the area available for the vehicular traffic, and is frequently responsible for a single file of vehicles proceeding over intersections capable of accommodating two lanes abreast. Prosecution and the infliction of a salutary fine appears to be the only way of overcoming offences in this direction.

**Wear of Road Surfaces.**

In its First Report the Commission made certain recommendations with respect to the preservation of road surfaces. As no action has been taken to give effect to the advice tendered in 1925, the recommendations are quoted below, and the Commission urges that the appointment of the Committee of Inquiry referred to in the “Legislation” sub-heading be given prompt attention—

"Speed.—For heavy traffic a limit of speed is essential to preserve the road. If a vehicle with a certain maximum load and suitable tires exceeds the speed suitable to the road, damage rapidly occurs, especially if the appointed speed is much exceeded. Not only is the surface, when slightly out of repair, subject to serious damage by excessive speed of a heavy load, but much more are the foundations seriously damaged, entailing greater expense for repair than the earning power of the vehicle causing the damage."
Weight.—To be reasonably possible and within the limit of sound financial administration there must be some restriction upon the weight of the vehicle and its load.

Assuming that some form of concrete road with or without a carpet is desirable to meet modern conditions—and the Commission considers that it is—there must be a limitation of the load carried per axle, otherwise even such a road will be expensive to maintain.

Axle Load.—The distribution or spread of the total load over the road surface as much as is possible is essential, and in this respect there must be a maximum allowable which shall not be exceeded.

In some cases, to distribute the load properly, more wheels than four should be provided. If the load borne by any one axle is greater than that which the road is designed to carry, damage will inevitably occur. Vehicles economical to users may now be constructed of such a weight and size that it is obvious that their use must be prohibited. There is a limitation upon the practicability of raising the standard type of road construction to meet the wants of classes of vehicles continually increasing in weight.

Tires.—For anything but the lighter traffic a prescribed width of tire is essential. This has been recognized in the Width of Tires Act, which, however, admits of varying standards in adjoining municipalities, causing confusion and uncertainty. Any legal provision therefore on this subject should be uniform for the whole State.

The use of projections on the surface of tires which come into contact with the road should be prohibited. The materials of which the tires are made may vary according to the other conditions of the load. Hard rubber tires, for instance, may be used with less damage to the road than hard metal tires, though having an equal load. Metal tires with rounded edges are not objectionable if the other conditions of the use of the road are complied with.

It is well recognized that vehicles with hard metal tires without limitation of load and rounded edges are very destructive to all types of road.

The diameter of the wheel should also influence the width of tire.

Legislation.—The Commission, having laid down the essentials of regulation, is, however, not prepared without further investigation to suggest the exact details of the standards requisite for reasonable restriction. These are matters which should be decided by, say, three competent engineers, and their decision made the subject of an amendment of the law.”

ROAD AND INTERSECTION IMPROVEMENTS.

Obstructions on Footways.

The use of footpaths and kerbs for the erection of pillars and encasements of various kinds, whilst not so serious a matter in outer areas, should be restricted in busy commercial streets. These obstructions take many forms, such as electricity switch pillars, postal pillars, verandah posts, tramway, telegraph, light and other poles, petrol pumps, &c.

Every effort should be made to locate such of these as are necessary as far away from street intersections as possible.

It is pleasing to note that the Melbourne and Metropolitan Tramways Board has avoided placing poles in streets where it has been possible to attach its wires to buildings. Recently the Postmaster-General’s Department has removed a number of street postal pillars from busy street corners, and this policy is to be commended and encouraged. The undergrounding of telephone wires has done much to enhance the beauty of the streets and to facilitate pedestrian movement. The opening up of pavements for the purpose of access to these and other underground services, however, is most undesirable, and recommendations in this regard are contained on page 57, et seq.

During recent years the erection of kerbside petrol pumps has proceeded apace, but still more recently the State Legislature passed an Act empowering local authorities to control the erection of these pumps. The Act specifically states that “a licence shall not be granted to any
person in respect of any petrol pump which, in the opinion of the council (of a municipality) unduly obstructs or will unduly obstruct the thoroughfare.” The erection of petrol pumps on footpaths is a usurpation by private individuals of a part of the public highway and should not be permitted.

Verandah posts unnecessarily obstruct footways and should be replaced by modern cantilever verandahs. In most new buildings provision is made for the cantilever type. The question of the abolition of shop verandahs altogether does not come within the scope of traffic regulation. (See page 276.) The verandah post, however, is to-day a distinct obstruction to pedestrian traffic, and its removal would be a decided improvement in busy streets, both from the aesthetic and traffic points of view.

On more than one occasion Local Government Bills introduced into Parliament have incorporated clauses to enable local governing authorities to prohibit the erection of any but cantilever verandahs, and for the demolition of those other than the cantilever type after a ten years' period without the payment of compensation. The 1929 Bill, unfortunately, excludes these clauses. The Commission considers that legislation along these lines should be passed.

**GRADES.**

The Commission has endeavoured, in all its new road proposals, not to exceed a grade of 1 in 20, and in almost every instance this desirable object has been attained. Many of the old roads, however, which are now important thoroughfares, and are therefore incorporated in the general scheme, have grades steeper than 1 in 20, but owing to the present state of development along them any appreciable improvement is regarded as impracticable.

**ROUNDING OF STREET CORNERS.**

The fixing of building lines or the rounding of the kerbs at street corners is advocated by the Commission as a simple improvement and one of the most satisfactory methods of facilitating the movement of traffic. Where vehicles, especially those with a large turning radius, have to make a left turn at a right-angled corner, they frequently leave the kerb and encroach upon the next lane of traffic to the right. In narrow streets this seriously interferes with traffic.

In all new plans of subdivision it should be compulsory to provide rounded or splayed corners. Wherever new building construction is contemplated, the advisability of securing a rounding or splaying of the street corner should be seriously considered, having regard to local conditions. In streets where tramway turnings occur such action becomes imperative. At intersections not subject to control the better view given to drivers of approaching vehicles by rounded corners tends to increased safety.

The rounding of corners will necessitate pedestrian crossings being so defined that the least distance of roadway will be traversed. In an ordinary four-way intersection of roads at right angles, the crossing for pedestrians would be normal to the kerbs, so as to avoid the rounded portion. The pedestrian traffic would then be removed slightly further from the intersection, and a bay would be formed which would accommodate vehicles awaiting the turn. They would be out of the line of the moving traffic without encroaching on the pedestrian crossing.

**GYRATORY MOVEMENT AT JUNCTIONS WHERE FIVE OR MORE STREETS CONVERGE.**

At important road junctions where more than four streets converge, special treatment is necessary. In most cases the improvement of these junctions, from a traffic point of view, could be obtained by planning a circular or oval island in the centre of the junction. The diameter of the central feature, and the treatment of the corners and other details of the junction, vary according to the conditions obtaining, but the principle is similar in each instance. This method of treatment compels traffic to gyrate around the central island in one direction until it reaches and turns into the desired street of exit. At such a junction, there should be little need for any method of control. The introduction of this system would eliminate confusion at awkward and dangerous intersections, thus ensuring a much greater degree of safety than is otherwise possible.

It is desirable that, at all such junctions, the central feature should be as large as possible and free from any vision-obstructing buildings or trees. The larger the radius of curve obtained by means of the island, the safer and more rapid it would be for the traffic using the intersection.

The central feature would lend itself to ornamental treatment and would supply a much needed refuge for pedestrians, and possibly sufficient space would be available in most cases for the location of seats, conveniences, and other amenities.
Many of these gyratory centres could be obtained by the establishment of building lines which would ensure the necessary splaying of corners or setting back of buildings, so that when the buildings fronting these corners become due for reconstruction, the opportunity could be taken to see that they conform to the new scheme.

The successful working of the gyratory system in London is graphically stated by a correspondent writing in the Melbourne Age of 4th September, 1926, as follows, in describing its introduction at Piccadilly Circus:

"It began on Monday last, and now every vehicle that enters must join in the gyratory movement round the site of the old Shaftesbury memorial, until it finds its desired outlet in one of the half-dozen streets that radiate from it. It has proved an immense success in Parliament Square, Trafalgar Square, and Hyde Park Corner. Fears that were entertained lest it should break down at the Circus were dissipated after 48 hours' experience, and drivers are now learning to read and observe the directions which, in huge white characters, are painted on the roadway. 'Turn left,' 'One-way street,' are becoming familiar signs, and the straight arrows and arrows doing a left turn, and the series of broad white lines are apparently fully understood. For the pedestrian the new order of things is not an unmixed blessing."

Similar methods have been adopted in various other countries.

Reference has been made in the First Report to several detailed recommendations of this kind, and on page 114 of this Report the Commission referred to the incorporation in the Spencer-street (Batman) bridge scheme of a gyratory centre at the southern bridgehead. On page 270, a city improvement scheme at Haymarket Junction, by means of the establishment of a central island and other features, has been submitted. In all other cases the Commission considers that the general principles outlined herein should be adopted, the actual details varying according to local conditions.
The metropolitan railway system, including certain isolated tramways, is operated as a State concern by the Victorian Railways Commissioners. Commencing in 1854 by the opening of the Melbourne to Port Melbourne line (which was then owned and operated by a private company), the suburban system has developed remarkably. There are now 179 miles of electrified suburban railway, whilst the passengers carried during the year 1928-29 were 152,840,573. Practically the whole of the suburban services are now electrified, the main portion of this great work having been completed in April, 1923, although certain outlying extensions have been added since. It is one of the largest electrified suburban services converted from steam operation in the world.

Nothing has influenced the trend of suburban development in this metropolis to a greater degree during the last half century than the railway system. Maps Nos. 1 and 6 herein illustrate how suburban development has spread and increased in density along the various routes, leaving sparse or less thickly peopled areas in between.

Map No. 3 (page 44) shows graphically the time zones of the metropolitan area, illustrating the travelling time occupied between all suburbs and the city by means of public transportation services. This map, especially in its relation to the more distant areas, is mainly based upon the railway system. As suburban development is influenced more by travelling time than distance, a comparison of Maps Nos. 1 and 6 with Map No. 3 will show the relationship of the railway services to the existing housing conditions.

A diagrammatic plan of the Melbourne suburban electric railways is below. It gives details of the mileages of the various terminal and junction stations from the Flinders-street and Prince's-bridge Stations, and also shows frequency of train services during peak and ordinary hours.

Diagrammatic plan of Melbourne Suburban Electric Railways, showing all lines, train frequency, and mileages.
Flinders-street-Prince’s-bridge Station.

These stations, which join each other, are regarded as one. They comprise the hub of the suburban railway system. The heavy concentration of people at this station is shown by the following figures supplied by the Railway Department of the numbers of passengers passing through the gates daily:

<table>
<thead>
<tr>
<th>Year</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1922</td>
<td>241,139</td>
</tr>
<tr>
<td>1923</td>
<td>265,000</td>
</tr>
<tr>
<td>1924</td>
<td>282,851</td>
</tr>
<tr>
<td>1927</td>
<td>317,322</td>
</tr>
</tbody>
</table>

Nearly one half of the daily traffic at this station is dealt with in four hours only. A recent calculation by the Department shows that the average numbers of trains, &c., that pass through the station daily (24 hours) is as follows:

- 1,912 suburban passenger trains.
- 28 country passenger trains.
- 102 goods trains and pilots.
- 30 light engines.
- 16 parcel coaches.

2,088 Averaging 87 per hour over 24 hours.

The busiest hour is from 5 p.m. to 6 p.m. when 116 suburban passenger trains alone depart from this station. The Commission supplied many statistics in its First Report, pages 12 to 15, in regard to the traffic at this station and its effect upon city traffic and development. In analysing the figures in their relation to future expansion, the Commission concluded that future improvements to facilitate train traffic were dependent upon the capacity of the streets and footpaths in its vicinity to accommodate such masses of people with safety and comfort and with a minimum of interference with the easy movement of all other road traffic. It is evident that, as the population grows and the metropolis expands, increasing congestion must be caused in this station, but more noticeably in the approaches to it. A stage will be reached when greater facilities must be given for railway users, or when intending passengers will revert to other means of travel.

The Commission considers that the most suitable way of overcoming the present pedestrian congestion in the vicinity of the Flinders-street Station, and as a means of avoiding much more acute conditions of congestion in this area, is by the construction of further city stations which will encourage a distribution of the pedestrian traffic, not only in the vicinity of the stations themselves, but also on the footpaths in the whole of the city area.

Northern City Railway.

On page 15 of the Commission’s First Report a recommendation was made for a new railway system to the north of the city as an effective solution of the difficulties caused by this enormous pedestrian traffic which crowds all thoroughfares giving access to the Flinders-street Station. It is considered that Melbourne has a unique opportunity to overcome the present disabilities caused by the existing location of the Flinders-street and Prince’s-bridge Stations, and at a cost which would be very small in comparison with what other cities have had to incur to obtain a lesser degree of relief.

The scheme suggested is shown diagrammatically on the plan opposite, and aims at the provision of an alternative route for trains through the north of the city proper, in addition to those lines using the southern loop via the Flinders-street viaduct. The route suggested as suitable for the proposed loop is as follows:

From Jolimont yards where the loop lines would parallel, and pass under the existing lines to a subway under and following the line of Exhibition street, thence continuing underground via a curve of suitable radius, and along the line of Victoria-street as far as a station at the intersection of Peel and Victoria streets, from which point the underground line would continue to North Melbourne Station, where interchange of traffic on proposed northern and southern loops would be possible.
The construction of the loop, as recommended, would not involve grades steeper than 1 in 60, and a considerable portion of line would pass under existing streets where the cut and cover method of construction could be employed.

It is suggested that stations at the intersection of Lonsdale-street and Exhibition-street, and at Peel-street, would serve the city area efficiently for many years after the construction of the railway, as all points within the proposed northern and the existing southern loop would thus be within twelve minutes' walking distance of some city railway station. Additional stations may be required and could be provided in the distant future.

Stations at the points indicated would cater for all traffic within the zones shown on the plan, which denote the walking time to the respective stations. As the city's commercial and business area is gradually extending northwards, it is reasonable to expect that the traffic which would be attracted to the northern city stations would continue to increase. The proposed new stations have been suitably located in regard to street passenger services, so that considerable interchange between underground and surface systems of transport would be possible. Richmond and North Melbourne would be common stations to both the northern and southern loops. Since a doubling of the metropolitan population may be confidently anticipated to create an increase greater than 100 per cent, in the railway passengers, it is obvious that Flinders-street Station will not be able to handle this additional traffic with facility. Moreover, as the peak traffic will require a proportionately greater number of trains to convey the crowds, it is probable that the existing number of trains which use Flinders-street will not be materially reduced, but rather will the excess trains or desirable number be diverted according to schedule, around the northern loop.

While the scheme as suggested would cater for any increase in passengers for a number of years, it would also allow of future extension in many directions, especially in regard to the possible linking up with the Heidelberg and Reservoir lines by a new line through Fitzroy and the provision of a probable future circular railway which would surround the city business area, and of which the proposed northern loop and southern route over the viaduct would form part. The construction of this loop railway would have the same effect as a duplication of the railway viaduct between Flinders and Spencer streets Stations.

Quite irrespective of whether the construction of a new railway on the lines suggested herein is justified, from a railway point of view, the Commission maintains that so long as Flinders-street Station continues to attract the huge and increasing pedestrian traffic, the precincts of the station will become increasingly more congested, and the footways and roadways, for a considerable distance in its vicinity, will be overloaded beyond their comfortable capacity. The Commission believes that the permanent solution lies in the distribution of the traffic over a wider area, and there is little doubt that this would be accomplished if stations, as suggested, were constructed reasonably close to the business centre of the city, and which would offer facilities for travel equal to that of the existing stations.

The Commission considers that this scheme should be referred to the Parliamentary Standing Committee on Railways to give the matter a more detailed consideration than this Commission has been able to do, so that future railway works may be carried out in full knowledge of a definite proposal for a new line and stations in the north of the city.

**Darling to Glen Waverley Railway.**

Authority was given by Parliament in 1926 for the suburban railway then terminating at Darling to be continued to Springvale-road at Glen Waverley, and the Commission was requested by the Government of the day to supply a special report making detailed recommendations for the preplanning of the area to be served. Under date 6th May, 1927, a Special Report was supplied to the Government and issued to all concerned, in which the Commission's recommendations were set down. It is not considered necessary to repeat in this Report the description of that comprehensive scheme, which dealt with an area of 11,700 acres of outer suburban lands. The plans, Sheets Nos. 10, 11, 14, and 15, published herewith, incorporate the proposals outlined in the Special Report, and on page 260 the Commission gives some details of the extremely successful results achieved.

There are, however, two matters particularly affecting the railway aspect of this scheme which might be mentioned here. In its Special Report, the Commission submitted plans and details supporting a recommendation that a slight deviation should be made in the adopted route...