

PART II

COMMUNICATIONS



## ROADS.

Probably one-quarter of the developed area of this City is set aside for the use of the general public for means of communication by road. It is, therefore, evident that there is no phase of city growth of more importance to the community. It is unfortunate that the past development of roads and streets has been allowed to take place with so little regard to their prospective use. The construction and maintenance of the roads are a charge on public funds, and it follows that if this money is to be wisely spent the road and street systems should be so designed and used as to give the greatest practicable convenience and service to the whole community.

The following extract from Harland Bartholomew's Report of 1917 on "Problems of St. Louis" is worthy of quotation:—

"The average town or city dweller is quite apt to pay little more attention to the streets he uses than to the air he breathes; he takes them both for granted. His business or his pleasure requires that he get about from place to place, and he uses the streets as he finds them, with a sense of satisfaction when his way is direct and free from interruption and of irritation when opposite conditions prevail. Generally, it is only when undue congestion impairs the free flow of traffic that he begins to realize the importance of an adequate system of streets, just as he realizes the value of clean, pure air when his surroundings become smoky and grimy; but if the importance of the subject is once appreciated, it becomes evident that the future growth of the community, as well as its present stability, is absolutely dependent upon the development of suitable avenues of travel, and that even very considerable sums expended to secure them will in the long run be many times repaid."

*Early Development.*—When examining the existing street system of this metropolis it must be remembered that Melbourne is not yet 100 years old. In that time a wilderness has been transformed into a city of over one million inhabitants. Very little thought was given to ultimate development in the early stages of its growth. In those early days no data was available to give an indication of future conditions, and therefore visionary ideas at that particular time may have resulted in much worse conditions than we have inherited. After the general trend of development had been established, however, forecasts of reasonable accuracy could have been made of probable future needs for a number of years. Pastoral requirements were the first to be met, and after the central and certain isolated settlements were laid out, the neighbouring lands were extensively surveyed for grazing areas. These Crown surveys were generally on the rectangular pattern with roads 66 feet wide, bearing in the cardinal directions. They were laid out with little or no regard for the contour of the country.

*Three-Chains Wide Stock Routes.*—The gridiron layout of the roads referred to was occasionally intercepted by diagonal roads leading to the market centre, which has since become the city proper. These diagonal roads were generally the original tracks used by horse and bullock teams, and by travelling live-stock, and they were subsequently included in the Crown surveys and later subdivisions. In order that the travelling stock could be assured of a certain amount of pasturage, these roads were often of a surveyed width of 198 feet. Although originally designed as stock routes, they now form one of the most valuable possessions of the metropolis from the utilitarian and aesthetic standpoints.

*Influence of Early Development on Existing Street System.*—As settlement proceeded many changes were wrought in the nature of development closer to the growing city, but all these changes, so far as the street system is concerned, have been influenced by the original Government surveys. The layout of the rectangular street system as it existed in 1855 is shown on the plan on page 52. The large pastoral holdings passed in turn to farms, smaller farms, market gardens, orchards, &c., and then into township allotments. Each change was dependent upon the individual viewpoint of the owner and purchaser of each property, who subdivided and used the holdings according to their own ideas. Until very recently there has been no effort to evolve a street system in which the subdivision of one property should be so carried out as to co-ordinate with the adjoining property, nor a thought for the effect which individual efforts may have on the metropolitan plan. The result of this procedure, which is little different to-day, is that the original stock routes are now called upon to meet the street needs of a city of over 1,000,000 inhabitants. There is no evidence of a saturation point with respect to metropolitan population, but the congestion in some of our thoroughfares during busy hours is evidence that the saturation point is being reached so far as direct routes of communication are concerned.



*The Petrol-driven Vehicle.*—The advance in the methods of transport during recent years has rendered possible much greater expedition of movement. The internal combustion engine has played a most important part in the evolution of speedier transit. This has transformed the whole basis of road communication. The encouragement and facility thus given for rapid and direct individual movement has taxed the capacity of the street system of nearly every city, because the streets and towns were not designed for such use. In order that the most effective use may be made of the street system, and modern requirements in respect of time-saving may be met as far as possible, the town planner must devise ways and means of providing the maximum facilities and improvements which economical and practical considerations will allow.

*Influence of Present Development on Future Street System.*—The Commission came to the conclusion early in its investigations that the roads passing through the inner built-up areas were insufficient to accommodate indefinitely the ever-increasing traffic being generated by the constantly expanding outer suburbs. Because of the heavy expense that would be incurred by any scheme of wholesale street widenings, the Commission has pursued a policy in the design of a plan of future development aiming at supplying alternative routes which in many instances actually give shorter distances of travel than those existing. On account of the lesser interruption to traffic on the new routes, savings in time will also follow their use.

The growth of the metropolis along the various railway lines, leaving comparatively sparsely settled areas between, as shown by the map on page 24, has permitted the planning of valuable wide highways at a fraction of the cost which would have been necessary to obtain the same advantages by any replanning of the existing main roads. Many of the routes now planned through the sparsely developed areas will intercept traffic which, in the ordinary course, would have continued to follow the old routes and resulted in added congestion in the inner areas.

*Ineffective Existing Streets.*—There are numerous streets in the metropolitan area which are suitably located and of sufficient width to warrant their much greater use. Owing to the configuration of Melbourne and the lack of suitable connecting links, these streets are not efficient units in the roads system. Their improvement and extension as a part of the general road scheme has, in the majority of instances, been planned so that entirely new vehicular routes are opened up not only to provide a good system of inter-suburban communications, but also to give more convenient access to the existing and proposed main trunk highways.

*The Influence of Streams.*—A serious dislocation of the street system is caused by the eight important streams which converge in a roughly radial direction on the inner areas. In nearly every instance the lands on either side of these streams are in different municipalities, the stream forming the boundary. The streams, generally speaking, have very winding courses and their steep banks have rendered the adjacent lands unsuitable for building purposes. One of the consequences is that the street layout in the vicinity of the watercourses is chaotic. Fortunately, however, these areas are the last of the inner suburbs to prove attractive to the home builder, and the lands referred to are comparatively cheap. This sparsely developed condition has enabled not only the planning of economical supplementary radial roads, but a reasonably good system of river and stream crossings for linking up the streets of the various municipalities so that a free interchange of traffic may be attained. By joining up the irregular street systems along the banks many excellent continuous routes can be secured.

*Tramway Routes.*—At present 139 miles of tramway routes are operated by the Melbourne and Metropolitan Tramways Board, and 10 miles by the Railway Commissioners. Eighty-eight miles of the total are laid in streets which are 66 feet or less in width.

When the tramways were first laid they followed roads which as a general rule were the principal traffic thoroughfares. When the various tramway undertakings were amalgamated under the present Melbourne and Metropolitan Tramways Board, that body took over the obligation to construct the road along the tracks, and for 18 inches outside each outer rail, as well as to illuminate certain of the tramway routes at night. Road construction and lighting have been carried out by the Board in a manner which has encouraged other wheeled traffic to follow the same route as the tramway. The result has been that vehicular traffic has become accustomed to using the tramway streets in travelling between the suburbs and city where they are connected by tram tracks. In streets on which tramways are laid, the peak vehicular traffic is coincident with the heaviest tramway loading, and only a limited use can be made of the tramway tracks owing to the frequency of trams. In the City streets, where the need for additional road space is greater, vehicular traffic is almost wholly precluded from using the space occupied by tramways.





**MELBOURNE IN 1855**  
 Showing the early stages of the rectangular form of development.

By J. H. Sturt, F.R.S.



Many sections of tramway streets are business and commercial thoroughfares, which encourage a line of stationary vehicles at the kerbside. In some streets of 66 feet or lesser width, the standing vehicle at the kerb reduces the road space available for moving vehicular traffic to such an extent that a vehicle cannot pass between a tramcar and a standing vehicle. As a consequence, in many instances, the speed of vehicular traffic is regulated by the speed of the tramcar. The frequency of tram stops necessitates the stopping or slowing down of other vehicles which collect and create congestion.

In the majority of cases the expense and difficulty involved in widening streets in which tramways are laid would impose too great a financial strain upon the community. Although in certain cases there is no satisfactory alternative, the Commission has planned its main road proposals so as to remove, as far as possible, the "through" vehicular traffic from the tramline streets. A system based on these lines will considerably relieve the congestion on these routes because it will leave the tramline streets principally for tramway services and local and business traffic.

**Where tramways are located or are proposed in streets of 99 feet width or more, excepting in the City business area, the Commission considers that the tramway should be given the exclusive use of its track and separated from other traffic by lawns or plantations.** In addition to segregating the traffic, the plantations provide continuous safety zones, thus permitting safer and faster movement of all traffic along the road and for pedestrians crossing it. Incidentally, tramway track construction and maintenance will be less costly.

In many cases in its recommendations which follow, the Commission has adopted a width of 100 feet for main roads in order that future development along these routes, other than in the city proper, shall be so guided as to permit of the "parking" of the existing or probable future tramway. This recommendation will necessitate an amendment of the existing legislation or of the official interpretation thereof. The provisions in this regard in the Tramways Acts are at variance with the Local Government Acts, but in neither case is authority given for the placing of tramways in reserves in streets of 99 feet width.

*The Influence of Zoning.*—There is a direct relation between the density and character of development and the volume of traffic. A comprehensive plan which makes correct provision for its residential, business and factory areas, which locates transportation services where the traffic can be most efficiently handled, and which also establishes playgrounds, parks, arenas, markets, public buildings, &c., in their most appropriate localities, materially aids the roads scheme. Different activities produce different kinds and amounts of traffic. An efficient street system cannot be obtained unless planned on a definite set of conditions governed by regulations which will not permit of their drastic change. Where the future form of development of an area is determined, the planner and engineer can at once decide the width, grade, direction, construction, cross-section, &c., of the roads required to serve that locality. By avoiding mixed development, provision can be made to reduce the cost of construction and maintenance of thoroughfares adequate for all requirements of purely residential neighbourhoods. The saving in construction and alteration costs and the elimination of waste which properly zoned districts permit, would go far to balance the more costly outlay to be met in localities which demand a higher standard of road construction.

As that part of the plan of general development outlined in Part IV, deals more fully with this phase of the work, only passing mention is made here. It must be obvious, however, that if the capacity of buildings in any area is such that they attract a volume of traffic so great as to impair free circulation in the streets of access, remedial measures must be taken. Either a greater amount of street space must be provided or the height of buildings must be regulated. As the width of streets where concentration is likely to occur is fixed, and the majority of buildings have not yet attained such a height as to affect seriously the traffic flow, it is of the utmost importance that the height of buildings should be regulated in accordance with the recommendations made in Part IV.

*Factors which Reduce Available Street Capacity.*—There are many influences which tend to reduce the effective capacity of streets for traffic movement. Up to a certain stage there is little need to consider this aspect of street study, but when the increase in vehicles or pedestrians using a thoroughfare has a tendency to retard the rate of movement, some regulation of the use of the available street width becomes necessary. Examples of retarding influences are:—The dangerous, confusing and disorganized operation of vehicles generally shown by failure to drive in lanes; the clogging of intersections by safety zones and car stops; the mingling of pedestrians with the



vehicular traffic; the effect of turns; the increment to the main road traffic from intersecting streets; "parked" vehicles; cross traffic at intersections; cutting up of roads and footpaths to attend to underground services; interference due to different types of vehicles or to varying speeds of movement; and the form of road surface, grade, or road repairs, &c. Probably the principal causes of the clogging of traffic in the principal streets of this Metropolis are the inadequate number of bridges and by-pass roads. The result is that a very large percentage of our traffic is compelled to follow routes which are indirect or are taxed above capacity. It is considered that the remedy or this lies in the adoption of the proposals contained in this Report.

A street system has certain limits to the amount of traffic it can carry, and if the height and use of buildings are not properly regulated the capacity of the street is likely to become insufficient. The question of limiting the height of buildings and defining the uses of property is dealt with under Zoning (Part IV.) and should be read in conjunction with this paragraph.

Pending the separation of the traffic into its correct routes, and allowing for the ever-increasing volumes of traffic our street systems are called upon to carry, regulation and control of the traffic must be a useful aid in the solution of the problem. Recommendations as to this are also made under appropriate headings in this Report.

The claims of the motorist for greater facilities are persistent, and frequently unreasonable. The Commission quoted statistics in its First Report to show that by comparison the stationary motor vehicle occupied 37 square feet of road space per passenger against 3·2 square feet per passenger on a standing electric tramcar or motor bus. These ratios are, of course, accentuated in the case of moving traffic. Whilst the motor vehicle must be accepted as a permanent factor in the street transport, and all practicable provision made for its accommodation, **the tramcar is by far the most economical user of street space.** The Commission took out figures from its traffic census of 29th April, 1924, which showed that the tramcars operating in the streets of the city proper constituted only 9·1 per cent. of the total city traffic, and only 16·6 per cent. of the passenger-carrying street services, yet they transported 72·8 per cent. of the passengers. The comparative figures for the census of 2nd December, 1926, are:—

Trams constituted .. ..	8.2 per cent. of total traffic.
Trams constituted .. ..	13.8 per cent. of street passenger traffic.
Trams carried .. ..	71.2 per cent. of total passengers.

Although horse transport is shown to be decreasing, a substantial part of the traffic is still of this class. This is evidence of its utility, and at its present rate of decrease it must take many years before this form of traffic can be regarded as obsolete in certain fields of service.

The stationary vehicles at the kerbside are one of the most uneconomical uses of street space, and this matter is specially dealt with next.

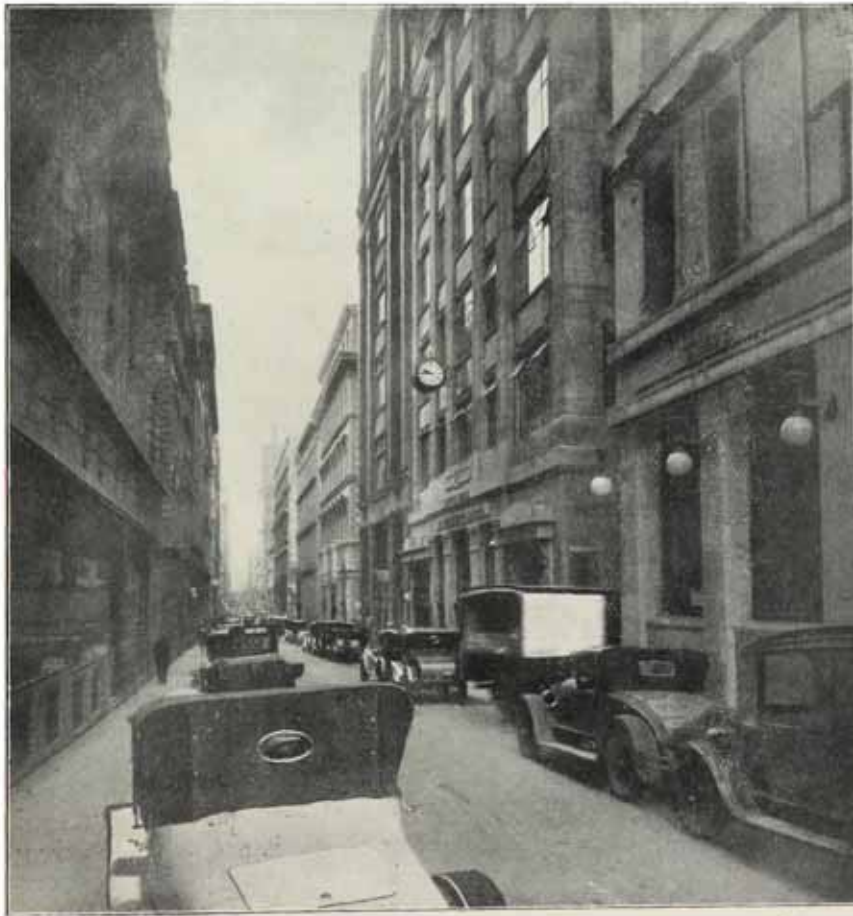
The use of the private motor vehicle for ordinary shopping purposes or for merely personal transport to and from business, causes a most extravagant use of street space. It is not reasonable to expect that huge sums of public money should be expended to provide additional facilities for this form of road use. As it is not practicable to prohibit the unnecessary use of private motor vehicles, a stage must be reached when the facilities now enjoyed by such use must result in delays, congestion and restrictions. The use of the first-class public transport systems of railways and tramways now available will then be found more convenient than the use of the private motor car by those desiring to reach the city.

*Parking of Vehicles.*—The standing vehicle at the kerb and the problems created thereby are wholly attributable to the increasing use of the motor vehicle as a medium of transportation. In earlier years, when the number of motor vehicles was small and all other street traffic was much less in volume, no objection was taken to the use of the street space at the kerb, except where it prevented the loading and unloading of goods for business houses. The increase in motor vehicles has been accompanied by an increasing desire on the part of owners to use the kerb space, until the stage was reached in Melbourne some time ago where controlling measures had to be taken. It has been possible to regulate motor car parking reasonably well, thus far, without causing unwarranted inconvenience to other traffic. Motorists had enjoyed a fairly long period prior to the introduction of regulations during which they became accustomed to parking their vehicles at the kerbside, and some have come to regard this facility as a moral obligation on the part of the authorities to preserve for them an area in which they may leave their cars. The use of the principal streets merely as garages, however, is obviously selfish, because many are inconvenienced and only a few are accommodated.



Vehicles parked at the kerb and in the centre of Queen-street, Melbourne,  
looking north.

*Brown Photos.]*



Traffic in Little Flinders-street, Melbourne, looking west, showing vehicles  
parked at the kerbs.

*Brown Photos.]*



The measure of control of this phase of city traffic difficulties, which has been almost universally adopted, is very well stated by Professor Miller McClintock of America :—

“ When the use of the street for storage purposes impairs the use of the street for purposes of transportation, or for acts directly connected with transportation, the former use must be prohibited.”

It is, however, in the application of this remedy that difficulty is encountered, inasmuch as it has to be determined when the traffic traversing any street, in which parking is allowed, is subjected to inconvenience to a greater degree than the motor vehicle owners who, by a prohibition of parking, would have to find some other place to leave their cars.

The convenience of being able to park cars at the kerbside is a real one, but as it is open to abuses it necessitates the imposition of a time limit and other regulation. Moreover, civic authorities may be justified in incurring moderate expenditure on increasing the amount of road space so as to delay the time when the prohibition of car parking in certain sections of our city streets might otherwise have to be enforced.

**The Commission does not approve the suggestion frequently made, that the municipality should be called upon to provide some form of garage accommodation off the streets. The onus of finding parking space according to the municipal by-laws, or otherwise at his own expense by garaging, must be left upon the individual.** Many proposals in this regard have been submitted to the public and to the Commission officially, including schemes for bridging over portions of the River Yarra, or the railway yards, and for underground garages under various streets, the utilization of the Western Market site, &c. The Commission cannot agree that any of these schemes is the responsibility of the municipalities.

It has been proved by census counts that the volume of through traffic in the streets of the City proper which could use other streets by-passing the congested portions of the City area amounts to approximately 43 per cent. of the total traffic. The removal of this percentage from the City business area would materially extend the time when the adoption of more stringent regulations would need to be enforced.

When the Commission's general scheme of roads for the metropolitan area, in conjunction with a bridge-construction programme, has been carried out, it will go a long way towards equalizing the distribution of city traffic in all streets, and thus avoid the acute concentration now evident in sections of certain city thoroughfares.

While these schemes will greatly assist the City traffic, there is little doubt that the increasing population and the encouragement given by the provision of extra facilities for street transportation will require more and more street space for moving vehicles. **It is the duty of the authorities to preserve the street space for its primary and proper use. The best method of doing this is by progressive regulation, and the prohibition of the standing vehicle, in conjunction with a systematic scheme of street improvements and direct routing of traffic, when the volume of street traffic becomes such as to require greater freedom of movement.**

The inconvenience caused by the parked vehicle is also pronounced in some of the busy suburban streets which carry a large volume of arterial traffic. **It would be in the best interests of the public if the regulations governing parking in the metropolitan area were framed by one authority whose duty it would be to maintain a systematic study and control of traffic conditions.** of the public if the regulations governing parking in the metropolitan area were framed by one authority whose duty it would be to maintain a systematic study and control of traffic conditions. The position of vehicles parked at the kerb should be determined by the character of the street and the amount of it which must be kept open for moving traffic. The present restrictions which prevent vehicles from parking in the vicinity of intersections, especially on tramline streets, are very necessary and should continue. The capacity of streets is not so much affected by a row of vehicles at the kerbs as by the difficulties of securing clearances at intersections. It is mainly the capacity at the intersections which determines the rate of movement.

The fact that the great bulk of the “ peak ” hours' traffic in the morning is inward to the central business area and outward during the afternoon, offers an excellent measure of relief in congested streets by temporary prohibition of parking on the particular side of the street on which this volume of traffic is passing. The extra lane thus made available, especially in the case of tram-line streets, would increase the efficiency and capacity of those streets in which a prohibition operated.

## UNDERGROUND SERVICES.

The closing of or interference with roads and footpaths in order that pipes and cables may be laid or repaired is a frequent occurrence. Two questions suggest themselves in regard to this matter:—Is this perpetual pulling up of the roads really necessary? Are not the traffic and the pedestrian entitled to some protection against these disturbances?

There is a distinct need for greater co-ordination between the authorities who control the underground services of the metropolis. Each authority places services under public roads or ways in accordance with its own immediate needs, and irrespective of the services or probable programme of other authorities. The multiplicity of services which are located under some of our roads practically prohibits an extension of any one of them without interference with others.

During 1927, in the Municipality of Melbourne proper, the following permits were issued to open roads. These figures do not include the ordinary road or footpath construction or the maintenance of and attention to tramway routes.

Melbourne and Metropolitan Board of Works—						
Water .. .. .	..	..	..	..	..	772
Sewerage .. .. .	..	..	..	..	..	35
Postal Department .. .. .	..	..	..	..	..	261
Gas Company .. .. .	..	..	..	..	..	783
Railways Department .. .. .	..	..	..	..	..	13
Melbourne City Council—						
Hydraulic power .. .. .	..	..	..	..	..	44
Electric Supply Department .. .. .	..	..	..	..	..	33
Plumbers, &c. .. .. .	..	..	..	..	..	3,543
						5,484

The total length of streets and lanes in the same area is as follows:—

Streets .. .. .	125 miles.	49 chains.
Lanes .. .. .	58 "	62 "
		184 "
		31 "

The importance of the location and control of the underground services is less apparent to the casual observer, because the numerous underground structures are out of sight or little in evidence.

The compiled records do not show the number of times particular streets have been dug up to enable replacements or repairs to be effected to the services. When once a street has been properly constructed, any breaking of it must seriously impair its condition, and the damage done by frequent digging of trenches means the expenditure, in the aggregate, of a very large sum.

Another aspect of this matter, which is only evident after cities attain a certain size, is the inconvenience and loss experienced by the general public as a result of the constant tearing up and laying down of pavements.

Many conferences and authorities have suggested means for overcoming the difficulties created by a lack of co-ordination of these services and a conference of engineers of metropolitan municipalities and public bodies in Melbourne has recently completed a report on the matter. The Conference made many recommendations which, if adopted uniformly, should operate with advantage. A number of the recommendations, however, may not receive general endorsement. On the subject of co-ordination between the various interested parties the Conference favoured the scheme at present in operation in the Municipality of Melbourne, which requires each of the parties to the agreement to give to each other due notice of intended openings for the ensuing six months, in order that the duration of street works may be shortened and the consequential and unavoidable inconvenience to the public reduced to a minimum.



The Conference of Engineers recommended that all services should be placed wherever practicable under the unpaved portion of footpaths in residential streets and under the footpaths of all other streets. The Commission endorses this recommendation.

The Engineers' Conference also recommended that, in order to avoid future disturbances of road and footway surfaces in residential streets, duplicate water and gas mains be laid, or alternatively ducts for service pipes should be laid at right angles every 50 feet, such work to be carried out, if practicable, during street construction operations.

Modern road construction in concrete and other durable materials makes the laying of services under the road-bed almost impracticable on account of the difficulty and cost of penetrating the roadway and of effectively repairing any excavations. Road reconstruction programmes in recent years have invariably included the lifting of various mains and their relaying in other than the constructed portions of the road-bed. Certain mains, however, have to give service connexions to the properties in the street, and unless these services are duplicated with a main on each side, connexions must be taken across the street, either in conduits provided for the purpose or by trenching, tunnelling, or boring under the constructed road. The stage has been reached in this metropolis where new methods might well be adopted for new areas of settlement, whereby definite sections of streets should be set aside for services. Duplication of mains should be provided for to avoid the tearing up of roads for laying small service pipes. This system should also be adopted when reconstruction of existing streets takes place.

It would appear that, where the number or volume of services in any important thoroughfare is large, the construction of subways or ducts for their accommodation should be seriously considered.

A further recommendation by the Conference of Engineers was that sewer mains should be laid at the rear of allotments where easements have been provided. This recommendation was made because of the considerable space occupied by manhole covers. The Commission favours this type of development, but considers that, wherever practicable, it should apply to more than sewerage services.

The Commission does not propose making any detailed recommendations as to the exact locations of services in relation to each other. The Conference of Engineers dealt with this matter fully and no doubt the views expressed will be borne in mind.

Authorities controlling underground services occasionally complain that the roots of street trees seriously affect their mains. Doubtless certain kinds of trees do affect the services. On the other hand, the tree is a very important factor in improving the amenities of residential streets and main roads. The Commission considers that the aesthetic value that can be attributed to street trees of suitable kinds, properly located, more than compensates for any inconvenience that may be caused.

#### SETTING BACK OF BUILDING LINES FOR STREET WIDENING PURPOSES.

In areas which are extensively built upon the principal item of cost of street widenings is the purchase of buildings for demolition and compensation for disturbances to the interests concerned, &c. In a growing metropolis such as Melbourne, rebuilding is constantly taking place. Though any particular street does not appear to alter materially over a period of a year or so, the aggregation of the alterations over longer periods of five to twenty years is such as frequently to cause a complete transformation. This is especially the case in Melbourne, where development is proceeding rapidly.

Where it is not considered necessary to widen certain streets immediately, but where—

- (1) the potential advantages of additional width are likely to be great; or
- (2) rapid changes are taking place; or
- (3) in derelict areas,

and where a widening of a street is an obvious ultimate necessity, power should be given to fix the building lines to which all new buildings must conform. In many of the recommendations which follow, the Commission has suggested that the building line of certain thoroughfares should be set back sufficiently to allow the excision of the forecourts to properties in order that



the width of roadway desired may be procured, in due course, without causing the destruction of buildings. The fixing of building lines beyond the existing property lines to permit the widening of a street can be applied with satisfaction and economy in many of the streets which form part of the Commission's scheme of metropolitan thoroughfares. Caution must be exercised, however, in the application of the principle of widening by set-backs.

Where the property fronting any street which is set down for widening is of a derelict character, and is consequently due for rebuilding, this method of widening can be applied with considerable success because the period of reconstruction will not cause any serious depreciation in street values or business. It can also be applied with advantage to streets which require widening and which are as yet sparsely built upon. The existing buildings which do not conform to the new building line after its adoption can be demolished to bring them into line after reconstruction with other buildings which had been erected to accord with the prescribed set-back. In these instances there will probably be many unbuilt-on allotments with frontages to the affected road, and the excision of the necessary portions of the forecourts of those allotments would only be the equivalent of a reduction in the depth of the allotment, which in many cases would be more than compensated for by the added value of the land as a result of the improvement.

In the case of the widening of business streets which have attained importance, the adoption of the principle of setting-back alignments would be too slow to be satisfactory. Moreover, it would probably result in the deterioration of the street from a business point of view far in excess of the economies which could be effected by an application of this method of treatment. The widening of streets of this type by comprehensive resumptions and demolitions, thus allowing for the erection of new buildings to the newly-created building line, enhances the value of the street and its abutting properties, whereas the comparatively rapid change does not result in a deterioration of the street generally from a business point of view.

Most town-planning schemes could with advantage incorporate the provision of street widening by setting back of building lines, and legislation should give these powers.

The *Sydney Corporation (Amendment) Act 1924*, and the *New South Wales Local Government Act 1919* (as amended by the Act of 1927), and the *New South Wales Main Roads Act 1924*, give wide powers to the authorities concerned to re-align public ways. The powers are perhaps a little too drastic in their effect upon the prohibition of other than minor structural amendments to existing buildings, and it is believed that some re-adjustment of the compensation clauses would be more acceptable. Nevertheless, the principles set down in those Acts are worthy of adoption. Great improvements have been secured, especially in the City of Sydney, with the aid of this legislation.

#### SETTING BACK GROUND FLOORS OR COLONNADING.

A method of widening built-up shopping or commercial streets where other schemes would be too costly is by the setting back of ground floors or by what is termed colonnading. This is carried out either by projecting the upper stories of a building over the ground floor, or by supporting the upper stories on columns, and locating the footpath under the projecting upper stories. A famous illustration of colonnading is in the Rue de Rivoli, Paris, where a beautiful effect has been secured. The chief object, however, of set-backs of this nature is to widen the road by the addition of the amount of street formerly occupied by footways.



Colonnading at Houston, Texas, U.S.A.



Rue de Rivoli, Paris.



There are many streets in this metropolis in which the adoption of this method of widening could be carried out with distinct advantage. This is especially applicable to the "Little" streets of Melbourne proper, viz., Little Flinders-street, Little Collins-street, &c. In quite a number of instances the owners of premises in these streets have already adopted in a small degree various forms of rebuilding which have in effect widened the footpath accommodation.

The setting back of ground floors not only affords an excellent means of widening narrow streets in an economical manner, which it would be almost prohibitive to attempt otherwise, but it renders a distinct service to business houses. It presents an opportunity for the architectural treatment of the colonnade. It protects goods displayed in windows from the effects of the sun, which is a matter of importance during summer in Melbourne. There is also much less tendency for pedestrians to stray on to the roadways.

#### STREET WIDENINGS—ADDITIONAL LAND REQUIRED.

Where new streets or street widenings are proposed through lands which have been built upon or subdivided, it is necessary, in order to secure a satisfactory scheme, to resume land in addition to that required for the actual street or widening. This avoids the severance of individual titles and the leaving of remnant parcels of land fronting the new street alignment. These remnant allotments are frequently unsaleable or can only be put to an inferior use. The acquisition of additional land enables the constructing authority to preserve the character of frontages to the new road. The land taken in addition to that required for the actual street construction should be sufficient for the re-subdivision of the new allotment with sufficient depths and suitable frontages to the new street.

Apart from the preservation of the amenities of the street which this procedure allows, it also offers in most cases a very substantial offset to the cost of carrying out these necessary public works, inasmuch as there is an increased value accruing to the saleable allotments fronting the new or widened street and to the neighbourhood in proportion to the added importance and the construction of the thoroughfare. This aspect of the matter is dealt with in the financial schemes submitted in this Report.

The principle of taking lands in excess of that actually required for the work itself has been approved of by the Victorian Legislature and is included in the Local Government Act. It should be accepted as part of town planning schemes prepared in accordance with the legislation which is recommended in Part X.

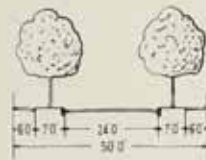
#### THE LAYOUT OF ROADWAYS.

A study of the streets of the metropolis shows that not only have their widths no relation to the volume of traffic they are called upon to carry, but that the layout of the roads themselves is not designed with the object of making the best use of them. Streets that are solely residential are frequently found with excessive widths of 99 feet and with up to 75 feet of constructed pavement between kerb lines, whilst streets carrying a double line of tramway and heavy vehicular traffic are of the inadequate width of 66 feet, which, after allowing for trams and footways, leaves only about 28 feet for vehicular traffic.

The capacity of a thoroughfare is governed by the design of its cross-section, which should be in accordance with the use made of the particular street. A strip 10 feet wide is generally regarded as necessary to provide a safe margin for the movement of general traffic. Any road which is divided into lesser units for the passage of vehicles or allowing for other than 10-foot lanes should be discouraged.

Streets of different character should have different cross-sections to cater for a considerable variation in the class of traffic which is to be accommodated and to preserve the amenities of the neighbourhood. The streets in this metropolis vary from 231 feet to 33 feet in width, with consequent great variations in their layout. Outside the central business districts those streets with a width of 99 feet and more should be constructed with a cross-section which will automatically divide the inward and outward bound traffic into separate roadways. Wherever greater widths permit, the heavy and light traffic should be segregated by the introduction of plantation strips. With the object of reducing the cost of construction, and apportioning the road space in the various kinds of streets in general use in the metropolis to meet the conditions for which they are being or are proposed to be used, the Commission suggests the adoption of cross-sections as shown on next page. No cross-sections are included in the diagrams for roads which are exceptions. They must be treated as special cases.

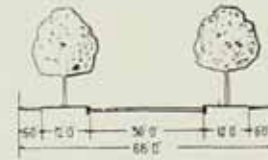
METROPOLITAN TOWN PLANNING COMMISSION.  
 RECOMMENDED CROSS SECTIONS OF ROADWAYS.  
 FOR WIDTHS IN GENERAL USE AND AS PROPOSED.



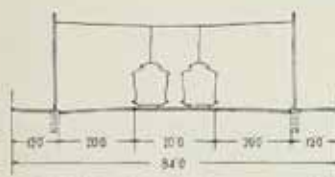
RESIDENTIAL STREETS.



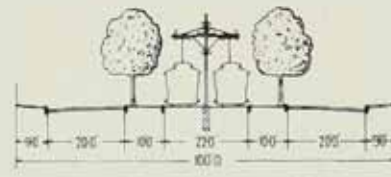
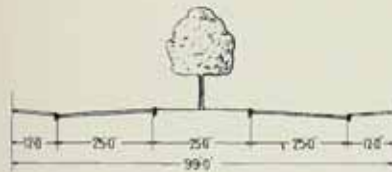
BUSINESS AND MAIN STREETS.



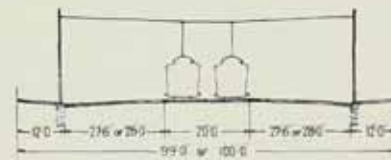
EXISTING RESIDENTIAL STREETS.



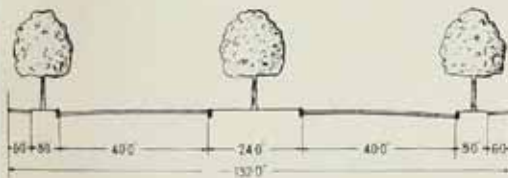
TRAFFIC AND TRAMWAY STREETS.

TRAFFIC AND TRAMWAY ROAD  
TUNULSAN

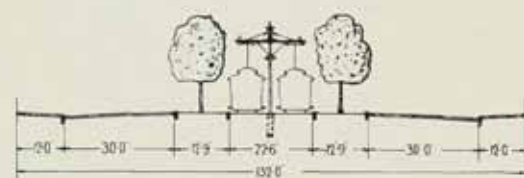
EXISTING RESIDENTIAL STREETS.



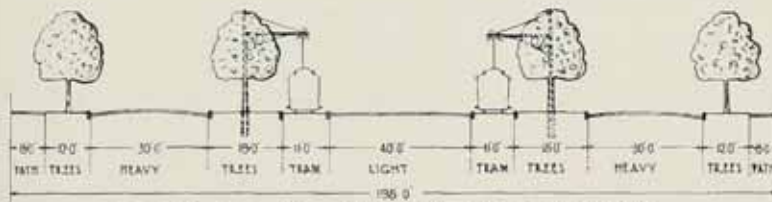
TRAFFIC AND TRAMWAY ROAD.



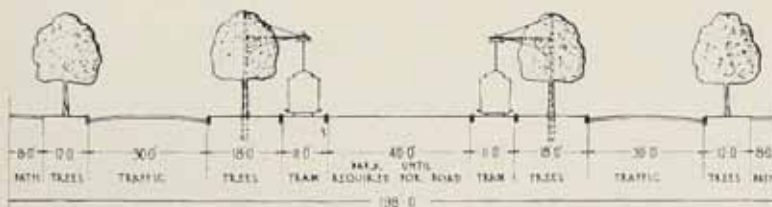
TRAFFIC ROAD.



TRAFFIC AND TRAMWAY ROAD.



PARKWAY ROAD FOR TRAM, LIGHT AND HEAVY TRAFFIC.

PARKWAY ROAD FOR TRAMS AND TRAFFIC.  
 WITH FUTURE PROVISION FOR ANOTHER TRAM

*Handwritten signature*



## ROADS IMPROVEMENT RECOMMENDATIONS.

## A SYSTEM OF THOROUGHFARES FOR MELBOURNE.

The street system of a city, in order best to serve its true functions, must allow of the free flow and interchange of traffic between all points. If a city were preplanned under modern conditions it should be possible to locate sufficient streets of suitable widths and grades in such a way as to provide the ideal distribution of traffic.

The predominant design of the metropolitan street system of Melbourne, with its direction mainly towards the cardinal points, renders difficult any "spider-web" design of thoroughfares. The proposed street system as outlined on the diagrammatic plan on opposite page incorporates the principal advantages claimed for the "spider-web" system, and some very valuable diagonal roads, usually unobtainable at reasonable cost in a built-up metropolis. Some existing main roads which are essentially business streets are not included in the general scheme, because one of the important purposes of the scheme is to show that through traffic need not and should not use those thoroughfares. If the proposed roads scheme is analysed by selecting any arbitrary points of origin and destination of traffic, it will be found that such points are reasonably accessible by a direct route.

## ARTERIAL ROADS.

It will be seen from Map No. 4 on page 118 that **the Commission has classified 22 principal radial routes in the suburban area as arterial roads.** These routes, as they approach the City, have been combined so as to form about 10 major highways, entering the central business area at points which are separated so as to encourage a more even distribution of traffic in the streets of the City proper. These routes, if developed as outlined hereunder, would form the main avenues for vehicular traffic between the City, its suburbs and the country beyond. Their length for the distances shown on the plan is 168½ miles. This is made up of 78 miles of existing streets, 46 miles of streets which it is recommended should be widened, 40 miles of proposed new streets, and 4½ miles of new roads which have already been included in plans of subdivision at the instance of the Commission.

These arterial roads, which are planned of sufficient width to carry a very large volume of traffic without undue interruption to its flow, are shown in black on Map No. 4. This systematic scheme of arterial roads would, when completed, bring practically all of the metropolitan population within the 10-mile radius of the centre of the City proper within 1 mile of at least one of these direct highways.

**The routes recommended are specially designed to encourage use by all through traffic and it is important that every facility should be given for the traffic on these roads to move speedily and safely.** With this end in view the Commission has planned, wherever possible, that these roads shall be crossed by other main roads as infrequently as practicable. It is desirable that connexions with important thoroughfares be made as nearly at right angles as possible, so that the traffic entering the main arteries shall have equal advantage of view in both directions. The traffic on arterial roads would be segregated into its proper classes by the adoption of suitable cross-sections. It should be given the right of the road and the necessary by-laws should be instituted not only to give effect to this in respect of these particular routes, but to direct that all intersecting traffic must stop before attempting to join or cross any of the 22 arterial routes.

The arterial roads are clearly indicated on Map No. 4 (page 118) and the Route numbers referred to below are indicated correspondingly on the plan. The numerical order does not signify order of importance.

*Route No. 1.—Port Melbourne to Melbourne Highway.*

An illustration shown on page 63 indicates more clearly the Commission's scheme for a highway from the piers at Port Melbourne, where oversea liners berth, to the City proper. The details as to how it is proposed to accomplish this and a full explanation of the scheme are given in the First Report of the Commission (pages 35 to 37). This approach to Melbourne is a drab and shabby one, which has been the subject of criticism by visitors as well as by citizens. When specially distinguished visitors come to Melbourne, it is the custom to disembark them by launch from their steamers and to land them at St. Kilda Pier. Two photographs on page 63 show the differences in the views which confront the traveller at present on these respective routes.