

GUIDE TO THE LOCATION OF GASOLINE (MOTOR FUEL) FILLING STATIONS AND FILLING-CUM-SERVICE STATIONS IN URBAN AREAS

FOREWORD

This Guide on the location of Gasoline Filling Station and Gasoline Filling-cum-Service Stations in urban areas has been prepared with the object of providing the necessary background and requirements for the location, siting, distribution and the number of such facilities etc. in an urban community. It is, however, not intended to serve as a guide to these uses along Highways outside urban areas. With the large number of registration of automobiles, this service facility along with the competitive business in the trade, presents problems of location, siting and distribution of these amenities. If not located on a proper basis these are likely to lead to the deterioration of the area.

In the Guide an attempt has been made to provide the basic requirements on aspects of location, siting and distribution of these amenities, and their impact and influence on the immediate environment in the overall context. In designing this manual the already available sources of information such as the Indian Road Congress Publications, have been referred to and the relevant standards in practice have been incorporated. The present planning practices and standards (including of available research material) in other countries, have also been studied and utilised in formulating the recommendations in the Guide.

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1. GENERAL

- 1.1. With the large number of registered cars and Filling Station in urban areas, the problems of the distribution, the location and the siting of Filling Stations need careful examination in regard to the control that requires to be exercised the legal tools that may be required to enforce such control and the optimum conditions that should be created from the point of view of service to the general public. A number of questions arise such as how many stations are needed to serve a given area. The main criteria for the location and the number of Filling Station and/or Service Stations is the economic principle i.e.. the number of Stations in that area that can be operated successfully at a profit. From the planning point of view, the main criteria would be that of the "service" function i.e., the number of stations to be located in any given area should be equal to the least number necessary to provide convenient service. A process of balancing the economic principle with that of the "service" function has to be gone through before the final decision is taken.
- 1.2. The location, site layout and the number of Filling Stations or Filling-cum-Service Stations depend very much on the pattern of development envisaged for the entire community. As the location on the overall pattern of development, it is essential to have a Master Plan for the location of Filling Stations and Service Stations for the said community on the basis of the overall Development Plan for the area. Such a Master Plan will simplify the procedure of approving a site for the location of these service amenities and will ensure that these amenities are sited based on the overall development pattern envisaged for the urban area.

2. Scope

- 2.1. This Guide deals with the number, location and siting requirements of Gasoline Filling Stations or Filling-cum-Service Stations in urban areas.
- 2.2. It also analyses the influence of this use on the immediate environment and the requirements which Filling and Filling-cum-Service Stations have to conform to in different use-zones such as residential, commercial and industrial areas, and along State and National Highway when passing through such urban areas.

3. Definitions

- 3.1. The term "Filling Station" as used in this Guide refers to a place of retail business engaged in the supplying and dispensing of Gasoline (Motor-fuel), and Motor-oil essential for the normal operation of automobiles.
- 3.2. The term "Filling-cum-Service Station" as used in this Guide refers to a place of retail business engaged in supplying goods and services essential for the normal operations of automobiles. These include dispensing Gasoline and Motor-oil; the sale and service of tyres, batteries and other automobile accessories and replacement items and washing and lubrication. They do not include body or fender work, painting or other major motor repairs and over-hauling.

4. Requirements of Filling Stations and Filling-cum-Service Station

- 4.1 Space Requirements:

4.1.1. The minimum plot sizes for the location of Filling-Stations and Filling-cum-ServiceStations should be as follows:

(a) Filling Station 30.00 M x 16.50 M

(In intensely developed areas and hilly areas the minimum frontage may be relaxed by the Town Planning Authority after complete investigations.)

(b) Filling-cum-Service Station 36.50 M x 30.00 M

4.1.2. Except in hilly terrain, the plot should be on level ground.

4.1.3. Every Filling Station should provide for one parking space for each four employees with a minimum of two car parking spaces.

4.1.4. In the case of Filling-cum-Service Stations in addition to the parking space requirements given in para 4.1.3, provision should also be made for one parking space for each service bay.

4.2. **Traffic Requirements**

4.2.1. A Filling Station or Filling-cum-Service Station is a major generator of traffic and as such presents a degree of traffic hazard along the roads on which it is sited. This potential traffic hazard determines the number of Stations that can be permitted in any section of a road or highway or in a section of the city, the objective being to keep the traffic hazard to the minimum.

4.2.2. A Filling or Filling-cum-Service Station should not be located opposite a break or opening in the central verge on a dual carriageway, as this will encourage traffic to cross the road while entering the Filling or Filling-cum-Service Station.

4.2.3. A Filling or Filling-cum-Service Station should not be sited too close to an intersection or a traffic island or a bridge or a culvert or a railway level crossing on the main road. To assure satisfactory weaving distances, the minimum desirable distance between an across to a Station and the tangent point of the traffic island on intersection or a bridge or a culvert or a railway level crossing should not be less than 90.00 metres.

4.2.4. In case of a main road provided along with a service road or a marginal access road, the access to the station should be provided from the service or marginal access road and not from the main road.

4.2.5. On roads having heavy traffic, it is desirable to provide one station on either side of the road at a distance of not less than 90.00 metres measured from tangent to tangent so that vehicles are not required to cross the road. On roads where the traffic cannot support two Filling Stations - one on either side, one Filling Station may be located on either of the sides provided the site is not close to a junction, and conform to the requirements of para 4.2.3.

4.2.6. Siting of Stations on road curves or bends is a safety hazard and should be avoided. They should also not be located adjacent to residential houses.

4.2.7. The minimum distance of the property line of the Filling Station from the Central line of the road must not be less than 15.00 metres or half the proposed right-of-way of the road, whichever, is more. In case of national

highways, state highways and major roads in urban areas they should be set back so as to be outside the ultimate right-of-way of the highway along which it is to be located. However, variations can be approved in special cases if allowed by the competent authority after complete investigations.

- 4.2.8. The heaping up of the oil-cans and other goods within the premises which tend to create a sort of ugly character to the area should be discouraged. Preferential locations in highly congested highways in urban areas create traffic problems which need proper and careful examination. Similarly the concentration of Filling Stations and Service Stations etc.. along traffic arteries creates problems in maintaining street capacity thereby depriving the community facility for mass and quick transport along the highways in urban areas.

4.3. Entrance and Exit Consideration

- 4.3.1. In all locations of Filling Stations, the basic principle governing the location as well as exit and entrance consideration is to minimise as much as possible interference with normal flow of traffic on the road.
- 4.3.2. For easy flow of vehicles into and out of the Station a minimum frontage of 30.00 metres shall be provided with wide and easy entrance and exit curbs. Vehicles entering and leaving the Station should be fully visible to the traffic on the main road and there should not be any obstruction to view between the Filling Station Pumps and the road.
- 4.3.4. The following minimum requirements for ingress and egress should be observed:
- (i) Maximum width of driveways at the side walks: 9.00 meters,
 - (ii) Minimum angle of intersection of driveway with the street pavement: 60°.
 - (iii) Minimum distance from any driveway to any exterior property line: 6.00 metres.
 - (iv) Minimum distance from any driveway to any interior lot line: 3.00 metres,
 - (v) Minimum distance between curb cuts: 9.00 metres.

4.4. Fire Safety Requirements

Technological advances in the construction and operation of modern Filling Stations or Filling-cum-Service Stations have greatly minimised if not altogether eliminated the fire hazards that were existing previously. However Filling Stations and Filling-cum-Service Stations do present certain degree of fire hazards due to (a) storage of explosive material and (b) operations such as filling when fire may break out because of carelessness. Therefore Filling and Filling-cum-Service Stations should comply with the Explosives (Temporary Provisions) Act, 1947, as amended up-to-date. The storage and handling of gasoline should be in conformity with the restrictions and safety standards proposed under the above Explosives Act. which regulates operations of inflammable substances like loading, unloading, handling, storage and conveyance etc.

4.5. Aesthetic Considerations

A great deal of criticism and prejudice has been associated with the aesthetic qualities of Filling Stations and Filling-cum-Service Stations. Service Stations by nature of the operations conducted in them present a disorderly picture. The noise generated in these

stations is another undesirable feature. Often property values tend to go down because of the proximity of a Filling Station or a Service Station. Therefore from the aesthetic point of view, the Filling-cum-Service Station present special land use problems different to those arising from other retail commercial uses. As a consequence they affect the general well-being of the neighborhood. Aesthetic requirements of Filling and Filling-cum-Service Stations have many far-reaching effects on the community in which they are located, particularly in the following aspects:-

(a) Design: The design and location of the Filling-cum-Service Stations have an immediate and visible impact on the circulation system in the urban community. In many communities there is an objection to build facades composed of lavender and orange porcolanised steel panels etc. which are very glaring to the eye and distracts the traveller by its loud visual impact thereby creating a potential traffic hazard.

(b) Sign-Boards: The multitude of sign-boards standing on the side-walk or street right of way, lighting arrangements etc. distract the attention of the motorist traveling along the highway and this would be a potential hazard in highways having heavy traffic.

But the Station area should have clear sign-boards ('IN' & E X I T boards) properly indicating the approach and exit from the premises and these should be installed within the site without interfering with the right of way of the highway. These sign boards should be provided with proper lighting arrangements in the night. Any other sign boards or bill boards should also be stated within the premises without distracting the traffic along the highway.

(c) Colour: The design and colour used for the various sign boards, bill boards, the building etc. are very much dependent the aesthetic requirements of the building design. The colour theme should preferably be of international convention which like these facilities easily distinguishable, but at the same time a very distractive to the traffic along the highway,

4.6. Requirements, regarding noise, smoke, dust and fumes and refuse disposal.

(a) Noise is an occupational hazard of the gasoline service stations. It is not only the highway noise but also the occupational pattern which produces noise, such as whitewashing, maintaining and making minor repairs etc. of undesirable level. Lastly the service stations being of light construction and single storey buildings, intrinsically have poor insulation sound proofing.

Transmission of noise by reflection and re-verberation can be checked to certain extent by locating Service Stations in a flat geography having an all-round open area of minimum 60.0 metres radius. The transmission of the sound waves from the Service Station can be successfully lessened by careful land-scaping with trees and hedges in the buffer space around.

(b) Smoke or fumes are not generally connected with the side in a Filling-cum-Service Station. However, in some circumstances smoke or fume nuisance is likely to occur near the service Station side due to unauthorized service facilities accorded within the premises. In such case where it does happen it is recommended that a proper provision of a shaft to transmit the smoke and fume away into atmosphere at a high level should be built into the building itself so that there will be minimum of smoke within the premises.

(c) A potential hazard in the case of the Service Station is of volatile liquids and their disposal. The oil and grease that drip from the car and are washed or hosed down the drains get into the drainage system. Similarly disposal of water used for cleaning and washing purposes; and disposal of grit and metal scraps pose

certain specific aspects of the drainage system for a Gasoline Service Station.

It should be ensured that the volatile liquids which may cause explosions or fire hazards do not get into main drainage system of the Service Station by providing volatile liquid interceptors.

Proper arrangements for the disposal of scraps oil and grit etc. should be ensured and the waste material should not be allowed simply to be dumped into the adjoining vacant space.

- (d) Service Station areas are generally associated with noise and dust due to the very nature of the occupation. To prevent and minimise dust within the premises, the entire approach and the forebay of Service Station should be paved preferably by brick pavement etc.

5. Criteria for Location of Filling Stations or Filling-cum-Service Stations.

- 5.1. A number of conflicts arise between location and design of the Filling Stations or Service Stations and present and the future pattern of land-use. Usually Filling or Filling-cum-Service Stations come up in newly developed areas only when development reaches a point at which business potential of the areas can be assessed. A delayed demand for Service Site is then created and will culminate in request for permits to use sites which are detrimental to sound development of the area. It is, therefore, desirable that once the character of the development anticipated in an area can be fairly well determined, provision for sites for Filling Stations or Filling-cum-Service Stations be made at the appropriate places.
- 5.2. Generally the Filling-cum-Service Stations show little affinity for established or planned commercial development discriminate or haphazard location of Service Stations or Filling Stations within retail concentrations tends to disrupt pedestrian circulation, creates "dead spots" in the retail pattern and is a blighting influence upon the area. On the other hand when these are located at the edge of shopping centre and on traffic artery both the Station and the retail stores benefit.
- 5.3. The design and location of Gasoline Service Stations give immediate and visible impact on the circulation pattern in the area. Preferences for locations on heavily travelled streets so as to obtain the maximum patronage from local area as well as the passing traffic results in serious traffic hazards and traffic congestion. The fix locational requirements of Filling Stations and Service-Cum-Filling Stations in different use zones are discussed below :-
 - 5.4.1. **Residential Area:** The number of Filling Stations or Service-Cum-Filling Stations that would be required in a residential area is governed by a number of factors.
 - (i) The size and importance of the town in which the residential area is located
 - (ii) The economic level of the residents.
 - (iii) The intensity of land use and gross density of persons per acre.

These factors vary from city to city and even within a city, in area to area depending upon the economic base of the urban community and no definite rule can be formulated regarding the number of Filling or Filling-cum-Service Station for residential area. However, as a minimum standard one Gasoline Filling Station for 15,000 population may be taken as the minimum requirement in residential areas.

- 5.4.2. **Commercial Areas:** The requirements of commercial areas are complex and it is essential to understand and assess the need of every commercial area in terms of Gasoline Filling Station depending upon the existing and proposed uses within the said area. The commercial areas can be classified broadly into five different commercial

classes: namely (i) The Central Business District, (ii) The District Centre, (iii) Neighborhood Shopping Centre, (iv) Local Shopping Area and (v) General Commercial Areas. The considerations for the location and number of Filling or Filling-cum-Service Stations in each of the areas are different. As a broad guidance the following considerations may be kept in view.

- (i) Gasoline Service Stations should be normally prohibited from the Central Business District and from the local shopping areas. Relatively high volume of pedestrian traffic and the need for separation of vehicular and pedestrian traffic makes the location of Service Stations undesirable in either of these areas. Further, high land values in the Central Business District, and the location of local shopping areas on the internal or local streets also prove prohibiting factors.
- (ii) Gasoline Filling Station and Filling-cum-Service Stations are essential components of the neighborhood shopping centre. They must however, be carefully located. Service Stations and similar uses create "deal spots" in the retail pattern thereby disrupting pedestrian and vehicular circulation. These Service Stations can have a blighting influence unless their location in these areas are selective. Service Stations should be preferably located at the margin of the neighborhood shopping centre when it is fully developed, away from primary pedestrian routes and with direct access from traffic arteries.
- (iii) Gasoline Filling and Filling-cum-Service Stations are also an essential part of a district centre and locational consideration mentioned for a neighborhood shopping centre equally apply in this case also.
- (iv) Activities which comprise general commercial areas do not generate a high volume of pedestrian traffic. As a consequence Service Stations do not have the same extent of blighting influence upon these areas. The location of the Service Station in these areas has, therefore, greater flexibility.
- (v) Gasoline Filing Stations are not recommended in local shopping areas. In Central Business Districts, they are preferably located on the fringes of the centre or on the traffic routes to such centres at suitable locations along the highway. In general Commercial areas they should be carefully located along traffic routes.

5.4.3 **Industrial Area:** Due to the heavy volume of traffic in and out of the industrial areas Filling Stations are perhaps better located along the fringes of the industrial area and along the highways leading to the industrial area preferably on either side of the highway. In addition, Gasoline Filling-cum-Service Stations should be located adjacent to any large open space provided used within the industrial area.

5.4.4 **Location on Highways:** The location of Gasoline Filling Stations or Filling cum-Service Stations along National and State Highways in urban areas has to be carefully done. The Indian Roads Congress has gone into this aspect in detail on their publication "Recommended practice for location and layout of Roadside Motor-Fuel Filling-cum-Service Stations". No IRC 12-1967.

6 General Arrangement of Filling and Filling-cum-Service Stations.

- 6.1 The general arrangement of Filling Stations and Filling-cum-Service Stations are shown in figures 1, 2 and 3. These are for general guidance only and depending upon actual site condition, certain variations may be made. In all the cases, however the principle dimensions should be adhered to and treated to the bare minimum.
- 6.2 In case of location of more than one Station, in a particular place, it is recommended that these should be grouped together with a single ingress and egress to the highway to avoid traffic hazards and showing up of the fast moving traffic by too many inlets and outlets at each Filling Service Station.