Research Paper

Volume : 1 | Issue : 5 | Oct 2012 • ISSN No 2277 - 8179

Evolving Pedestrian Friendly Residential Neighbourhood Layout

Architecture

KEYWORDS :

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ABSTRACT

Indian cities are growing rapidly due to boost in production and sustained economic growth over the past decade. This has created wealth entailing increase in consumer demands. A surge in vehicular sale is seen with Delhi registering more than 1000 vehicles everyday adding to an existing vehicular count of more than 6 million. Increase in vehicular volume has created a chaotic situation on urban roads. The problem of traffic congestion has crept from the city main roads to collector streets and local streets. The residential areas having relatively less ROW are worst affected by increase in volume of vehicular traffic and Off-street parking. The residential neighbourhood roads no longer remain safe for the pedestrian and children. The concept of a peaceful neighbourhood with low vehicular traffic and pedestrian friendly circulation pattern lies in tatters.

The residential areas are the bedrooms of any city. The residents of these areas invest their life time savings to procure a decent and peaceful living space and a healthy residential environment. These areas are supposed to be free from everyday hassles and conflicts of urban life. It should be friendly to the pedestrian movement. It is essential to evolve residential sector layouts to sort out the problems of urban traffic chaos. The paper aims to determine the following:

- *Restrict the vehicular movement in residential areas.*
- *Local shopping areas to be segregated from the residential zone in the residential areas.*
- *Discouraging thoroughfare inside residential areas.*
- *Segregating vehicular and pedestrian traffic.*
- *Avoiding conflict points and provision of pedestrian safety measures at conflict points.*
- *Evolving pedestrian friendly, environment friendly and safe traffic movement inside the residential areas.*

The study shall cover only the residential areas of an urban set up. It shall consider the facilities inside the sector and not take into account the influence of facilities adjacent to the residential areas.

2. Introduction

Indian civilization has evolved through its long history as has its urban scape. The brick walls of the Harappan civilization and the wooden fenced vedic villages gave way to the stone walled medieval cities. The invent of the steam engines and subsequent development of motor vehicles have made the walled cities redundant in the 19th century city planning. The industrial revolution lead to development of new ideas, inception of a new age and abolishment of monarchies in several countries of Europe and America. Development of democratic ideas of liberty, equality and fraternity changed the mind set of citizens. The focus of development shifted from individual needs of royals and nobles to the common citizen of the state.

The industrial revolution lead to mass migration of rural population to urban areas. This created housing crisis in urban areas and promoted development of slums. Many thinkers , philosophers, writers highlighted the evils of urban areas and urban planners worked endlessly to form strategies and policies to mitigate the ill effects of industrial development. Provisions of social infrastructure for the welfare and upliftment of the urban dwellers become the focus of urban planning. The trend to develop a healthy and safe living environment for the urban dwellers continues till date. The issues have evolved with the changing times. Urban Planning has evolved from provision of basic social and physical infrastructure to classification of urban areas according to various land use. Development of new urban areas takes place by dividing the entire area into various sectors according to the type of land use.

The advent of motorized transport has created the problem of traffic congestion which has crept from the city main roads to collector streets and local streets of various city sectors. The residential areas having relatively less ROW are worst affected by increase in volume of vehicular traffic and Off-street parking. The residential neighbourhood roads no longer remain safe for the pedestrian and children. The concept of a peaceful neighbourhood with low vehicular traffic and pedestrian friendly circulation pattern lies in tatters.

It is essential to evolve residential sector layouts to sort out the problems of urban traffic chaos. The paper aims to determine the following:

- Restrict the vehicular movement in residential areas.
- Local shopping areas to be segregated from the residential zone in the residential areas.
- Discouraging thoroughfare inside residential areas.
- Segregating vehicular and pedestrian traffic.
- Avoiding conflict points and provision of pedestrian safety measures at conflict points.
- Evolving pedestrian friendly, environment friendly and safe traffic movement inside the residential areas.

The study shall cover only the residential areas of an urban set up. It shall consider the facilities inside the sector and not take into account the influence of facilities adjacent to the residential areas.

2.0 Residential Sector Facilities

Residential sectors are developed with the prime objective to provide the following:

- Space allocation for housing quarters for all the sections of the society.
- Provision of basic facilities to support daily needs of the residents within walking distance.
- A peaceful habitable neighbourhood free from the hassles of day-today urban life.·

2.1 Space allocation for housing quarters for all the sections of the society

The provision of housing quarters translates into dividing the land area into suitable plots. The principle of inclusive planning advocates provision of housing for each and every section of the society. The plot sizes are governed by the buying power of the various sections of the society. The table below indicates the general classification of plots

Table 2.1 Classification of housing plots

Sl. No.	Housing classification according to the buying capacity of the individuals
1.	Housing for EWS
2.	Housing for LIG
3.	Housing for MIG

4.	Housing for HIG
5.	Group Housing

2.2.2 Basic supporting facilities in residential sector

The supporting facilities in residential sector are provided to make the daily needs available within walking distance. It also helps to reduce the inter-sector travelling within the urban area for each and every need. This reduces unwanted traffic on the arterial and sub-arterial roads of the urban area. The approach to the support facilities inside the sector is desired to be pedestrian. The following are the basic support facilities intended in a residential sector.

Table 2.2 Basic support facilities within a residential sector

Sl. No.	Basic support facilities within a residential sector
1.	Tot lot/Montessary/ Nursery school
2.	Primary School
3.	Senior Secondary School
4.	Community hall
5.	Library
6.	Parks
7.	Convenient Shopping Centre
8.	Local Shopping Centre
9.	Auto Stand

2.3 Peaceful habitable residential neighbourhood

The residential neighbourhoods are designed to be peaceful and free from the hassles of urban life. The present residential layouts fail to meet the above criteria allowing the vehicular chaos on urban roads to crawl into the residential areas. It is essential to analyse the traffic situation in the residential areas in the light of objectives they are required to fulfill.

3.0 Traffic analysis of residential sector

The traffic in residential areas needs to be analysed in relative terms to the various facilities within the residential areas.

Table 3.1 Traffic analysis of residential sector

Sl. No.	Provisions within a residential sector	Peak Traffic Hours		Traffic volume	Intra-day traffic volume	Predominant Traffic type		Predominant Traffic Origin	
		Morning	Evening			Vehicular	Pedestrian	Inside Sector	Outside Sector
1.	Housing for EWS	8:00-10:00	6:00-8:00	Low	Very Low	-	Yes	Yes	-
2.	Housing for LIG	8:00-10:00	6:00-8:00	Low	Very Low	-	Yes	Yes	-
3.	Housing for MIG	8:00-10:00	6:00-8:00	Low	Very Low	-	Yes	Yes	-
4.	Housing for HIG	8:00-10:00	6:00-8:00	Low	Very Low	-	Yes	Yes	-
5.	Group Housing	8:00-10:00	6:00-8:00	Low	Very Low	-	Yes	Yes	-
6.	Tot lot/Montessary/ Nursery school	8:30-9:00	12:00-12:30	Low	Very Low	-	Yes	Yes	-
8.	Primary School	7:30-8:00	1:30-2:00	Medium	Very Low	-	Yes	Yes	-
9.	Senior Secondary School	7:30-8:00	1:30-2:00	Heavy	Very Low	Yes	-	Yes	Yes
10.	Community hall	1:00-3:00	After 8:00	Medium-Heavy	Very low	Yes	-	Yes	Yes
11.	Library	-	6:00-8:00	Low	Low	Yes	-	Yes	-
12.	Parks	6:00-9:00	5:00-8:00	Low	Very Low	-	Yes	Yes	-
13.	Convenient Shopping Centre	7:00-8:00	6:00-8:00	Low	low	-	Yes	Yes	-
14.	Local Shopping Centre	-	5:00-9:00	Medium-Heavy	Medium	Yes	-	Yes	-
15.	Auto Stand	8:00-10:00	5:00-8:00	Heavy	Heavy	Yes	-	Yes	-
16.	Government Offices	9:00-10:00	5:00-6:00	Medium-Heavy	Medium-heavy	Yes	-	-	Yes
17.	Commercial Belt	10:00-11:00	6:00-9:00	Heavy	Heavy	Yes	-	-	Yes

3.1 Areas which can be clubbed together according to the Peak Traffic hours

The peak traffic hours indicates the time of maximum vehicular movement for the various provisions in the residential area. Some provisions may have a differentiated peak traffic hour which can be accommodated with some other provision as not to accumulate traffic. Some provisions may have same peak traffic hours. These are to be separated and it should be attempted to have a different entry and exit for them.

Table 3.2 Areas with compatible traffic peak hours

Sl. No.	Provisions within a residential sector	Peak Traffic Hours	
		Morning	Evening
1.	Housing for EWS	8:00-10:00	6:00-8:00
2.	Housing for LIG	8:00-10:00	6:00-8:00
3.	Housing for MIG	8:00-10:00	6:00-8:00
4.	Housing for HIG	8:00-10:00	6:00-8:00
5.	Group Housing	8:00-10:00	6:00-8:00
6.	Tot lot/Montessary/ Nursery school	8:30-9:00	12:00-12:30
8.	Primary School	7:30-8:00	1:30-2:00
9.	Senior Secondary School	7:30-8:00	1:30-2:00
11.	Library	Opening time	Closing time
12.	Parks	6:00-9:00	5:00-8:00
13.	Convenient Shopping Centre	7:00-8:00	6:00-8:00
10.	Community hall	1:00-3:00	After 8:00
14.	Local Shopping Centre	-	5:00-9:00
15.	Auto Stand	8:00-10:00	5:00-8:00

3.2 Areas which can be clubbed together according to the Traffic volume

The areas with low traffic volume during the peak hours can be clubbed together. The areas with medium and heavy traffic volumes should be located away from the low traffic areas.

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Table 3.2.1 Areas with low traffic volume

Sl. No.	Provisions within a residential sector	Traffic volume
1.	Housing for EWS	Low
2.	Housing for LIG	Low
3.	Housing for MIG	Low
4.	Housing for HIG	Low
5.	Group Housing	Low
6.	Tot lot/Montessary/ Nursery school	Low
7.	Library	Low
8.	Parks	Low
9.	Convenient Shopping Centre	Low

Sl. No.	Provisions within a residential sector	Traffic volume
1.	Primary School	Medium
2.	Senior Secondary School	Heavy
3.	Community hall	Medium-Heavy
4.	Local Shopping Centre	Medium-Heavy
5.	Auto Stand	Heavy
6.	Government Offices	Medium-Heavy
7.	Commercial Belt	Heavy

Table 3.2.2 Areas with medium-heavy traffic volume

3.3 Areas which can be clubbed together according to the traffic volume and intra-day Traffic volume

The peak hour traffic and intra day traffic volume can also be used to determine the compatibility of the facilities. The facilities with low traffic volume at peak hours and very low intra-day traffic volume can be clubbed together. The facilities with low traffic volume at peak hours and low intra-day traffic volume can be clubbed together. Facilities with medium-heavy traffic volume and very low intra-day traffic can be kept together. Facilities with medium-heavy traffic volume at peak hours and medium intra-day traffic are to be separated from the residential areas. Facilities with heavy traffic volumes throughout the day are to be excluded from the residential areas.

Table 3.3.1 Areas with low traffic volume and very
Table 3.3.2 Areas with low traffic volume and low

Sl. No.	Provisions within a residential sector	Traffic volume	Intra-day traffic volume
1.	Library	Low	Low
2.	Convenient Shopping Centre	Low	low

low intra-day trafficintra-day traffic

Sl. No.	Provisions within a residential sector	Traffic volume	Intra-day traffic volume
1.	Housing for EWS	Low	Very Low
2.	Housing for LIG	Low	Very Low
3.	Housing for MIG	Low	Very Low
4.	Housing for HIG	Low	Very Low
5.	Group Housing	Low	Very Low
6.	Tot lot/Montessary/ Nursery school	Low	Very Low
7.	Parks	Low	Very Low

Table 3.3.3 Areas with medium-heavy traffic volume Table 3.3.4 Areas with medium-heavy and very low intra-day traffic traffic volume and medium-heavy intra-day traffic

Sl. No.	Provisions within a residential sector	Traffic volume	Intra-day traffic volume
1.	Primary School	Medium	Very Low
2.	Senior Secondary School	Heavy	Very Low
3.	Community hall	Medium-Heavy	Very low

Sl. No.	Intra-day traffic volumeTraffic volumeProvisions within a residential sector
1.	MediumMedium-HeavyLocal Shopping Centre
2.	HeavyHeavyAuto Stand

3.4 Areas which can be clubbed together according to the Pre-dominant Traffic type

This analysis shall ensure determination of pedestrian and vehicular dominant movement in the various residential quarters.

Table 3.4.1 Areas having pre-dominant pedestrian movement

Sl. No.	Provisions within a residential sector	Pre-dominant Traffic type	
		Vehicular	Pedestrian
1.	Housing for EWS	-	Yes
2.	Housing for LIG	-	Yes
3.	Housing for MIG	-	Yes
4.	Housing for HIG	-	Yes
5.	Group Housing	-	Yes
6.	Tot lot/Montessary/ Nursery school	-	Yes
7.	Primary School	-	Yes
8.	Parks	-	Yes
9.	Convenient Shopping Centre	-	Yes

Table 3.4.2 Areas having pre-dominant vehicular movement

Sl. No.	Provisions within a residential sector	Pre-dominant Traffic type	
		Vehicular	Pedestrian
1.	Senior Secondary School	Yes	-
2.	Library	Yes	-
3.	Community hall	Yes	-
4.	Local Shopping Centre	Yes	-
5.	Auto Stand	Yes	-
6.	Government Offices	Yes	-
7.	Commercial Belt	Yes	-

3.5 Areas which can be clubbed together according to Pre-dominant traffic origin

This analysis shall help to classify the traffic that is from inside the sector and the traffic which comes from outside the sector. The facilities with pre-dominant outside sector traffic cause the most disturbance to the peaceful living environment of the residential sector. These facilities shall be clubbed together and located preferably on the sectoral periphery to eliminate unnecessary traffic inside the residential sector.

Table 3.5.1 Core residential areas which are proposed to be free from any thoroughfare/unnecessary vehicular movement

Sl. No.	Provisions within a residential sector	Pre-dominant Traffic Origin	
		Inside Sector	Outside Sector
1.	Housing for EWS	Yes	-
2.	Housing for LIG	Yes	-
3.	Housing for MIG	Yes	-
4.	Housing for HIG	Yes	-
5.	Group Housing	Yes	-

Table 3.5.2 Areas that need access from residential areas within the sector

Sl. No.	Provisions within a residential sector	Pre-dominant Traffic Origin	
		Inside Sector	Outside Sector
1.	Tot lot/Montessary/ Nursery school	Yes	-
2.	Primary School	Yes	-

3.	Parks	Yes	-
4.	Convenient Shopping Centre	Yes	-

Table 3.5.3 Areas that need access from residential areas within as well as outside the sector

Sl. No.	Provisions within a residential sector	Pre-dominant Traffic Origin	
		Inside Sector	Outside Sector
1.	Senior Secondary School	Yes	Yes
2.	Library	Yes	-
3.	Community hall	Yes	Yes
4.	Local Shopping Centre	Yes	Yes

Table 3.5.4 Areas which need no direct access from the residential sector

Sl. No.	Provisions within a residential sector	Pre-dominant Traffic Origin	
		Inside Sector	Outside Sector
1.	Government Offices	-	Yes
2.	Commercial Belt	-	Yes

3.6 Analysis Result

The above analysis yields the following parameters which can be used to check the efficiency of any residential sector in terms of it being pedestrian friendly and fulfilling the objectives of the residential area. The desirability of preferred type of movement (pedestrian/vehicular) is determined. The placement of various facilities in the sector is also determined to achieve the following aims:

- Curb unwanted vehicular movement inside the residential sector.
- Prevent unnecessary vehicular traffic from entering the residential sector.
- Prevent the usage of sectoral main road for thoroughfare.
- Keep the ill effects of vehicular congestion and parking problems from entering the residential sector.
- Maintain the tranquility of the residential environment.
- Making the streets friendly for the pedestrians.
- Removing the fear of fast moving vehicles passing through the sector and making the residential main roads safe for pedestrian and children.

Table 3.6.1 Desired Movement and location of facilities in residential sector

Sl. No.	Provisions within a residential sector	Type of access desired from within the sector		Placement of the facilities				
		Vehicular	Pedestrain	Sector Core Park facing	Sector Sub core	Sector main roads	Sector main gate	Sector peripheral road
1.	Housing for EWS	-	Yes	-	-	Yes	-	-
2.	Housing for LIG	-	Yes	-	-	Yes	-	-
3.	Housing for MIG	-	Yes	-	Yes	-	-	-
4.	Housing for HIG	-	Yes	Yes	-	-	-	-
5.	Group Housing	-	Yes	-	-		-	Yes
6.	Tot lot/Montessary/ Nursery school	-	Yes	Yes	-	-	-	-
8.	Primary School	-	Yes	-	-	Yes	-	-
9.	Senior Secondary School	-	Yes	-	-	-	-	-
10.	Community hall	-	Yes	-	-	-	Yes	Yes
11.	Library	-	Yes	-	Yes	Yes	Yes	-
12.	Parks	-	Yes	Yes	-	-	-	-
13.	Convenient Shopping Centre	-	Yes	-	Yes	-	-	-
14.	Local Shopping Centre	-	Yes	-	-	-	-	Yes
15.	Auto Stand	-	Yes	-	-	-	-	Yes
15.	Government Offices	Direct Access to sector not desired		-	-	-	-	Yes
16.	Commercial Belt			-	-	-	-	Yes

4.0 Case Study- Sector Gama-II, Greater Noida, Uttar Pradesh

4.1 Introduction

Greater Noida is an industrial township which is still under development. The township is well laid out meeting state of the art design guidelines and promises a comfortable and lovely stay for its residents by means of provisions of state of the art basic infrastructure facilities. The I Phase of its development is almost complete and it has several residential sectors that are operating well as per the needs of the residents. The roads are well designed and laid. There is adequate provision of drainage and sewage by means of sewage lines and storm water drains to prevent water logging in times of heavy rainfall. There is ample provisions of green belts along the roads and green spaces have been left out in each and every sector in the form of playgrounds and parks. This is beside the city park and golf course that act as the lung of the city. The township has lush green lawns and greenery is abundant in its landscape which is well maintained by the Greater Noida Industrial Development Authority.

Table 4.1 Analysing Existing Facilities at Sector Gama-II

Sl. No.	Existing Land uses/ Facilities in Sector Gama-II	Area of Plots (sq. m.)	No. of Plots	Type of access desired from within the sector	Existing	Placement of the facilities in sector Gama-II				
						Sector Core Park facing	Sector Sub core	Sector main roads	Sector main gate	Sector peripheral road
1.	Housing for EWS	60	836	Pedestrain	Vehicular	-	-	NA	-	-
2.	Housing for LIG	120	190	Pedestrain	Vehicular	-	-	NA	-	-
3.	Housing for MIG	200	229	Pedestrain	Vehicular	-	NA	-	-	-
4.	Housing for HIG	350	85	Pedestrain	Vehicular	NA	-	-	-	-

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5.	Group Housing	-	-	Pedestrain	Vehicular	-	-		-	NA
6.	Tot lot/Montessary/ Nursery school	723 & 1000	2	Pedestrain	Vehicular	Yes	-	-	-	-
8.	Primary School	-	-	Pedestrain	Vehicular	-	-	NA	-	-
9.	Senior Secondary School	-	-	Pedestrain	Vehicular	-	-	-	-	NA
10.	Community hall	1500 & 2874	2	Pedestrain	Vehicular	-	es	Yes	Yes	Yes
11.	Library	526	1	Pedestrain	Vehicular	-	Yes	Yes	Yes	-
12.	Parks	-	5	Pedestrain	Vehicular	Yes	-	-	-	-
13.	Convenient Shopping Centre	500 each	2	Pedestrain	Vehicular	-	Yes	-	-	-
14.	Local Shopping Centre	4000 & 3734	2	Pedestrain	Vehicular	-	-	Yes	Yes	Yes
15.	Government Offices/ Water works	Temp. Auth. office	1	Vehicular	Vehicular	-	-	-	-	Yes
16.	Commercial Belt	50 m wide	1	Vehicular	Vehicular	-	-	-	-	Yes

4.2 Analysis

- The sector is divided into 4 parts by a main collector road inside the sector according to the plot size.
- Each quarter has its individual park.
- The main road runs through the sector bringing unnecessary traffic and encouraging thorough fare in the residential areas. (Fig. 4.2.1)

Fig. 4.2.1 Quarterly division of sector by Main Collector Street

- The location of Greater Noida Industrial Development Authority Office on the Sectoral peripheral road near the main gate of the sector has created a surge in vehicular traffic eating into the sectoral peripheral green belt. (Fig. 4.2.2)

Fig. 4.2.2 Danger Zone for pedestrian

Fig. 4.2.3 Location of LSC and Authority Office

- Location of local shopping Centre on the main gates and the main roads leads to the following problems:
- Shortage of parking space.
- Side street parking along the roadside blocks the movement of regular traffic on the road creating chaos on the main road. (Fig. 4.2.3)
- The green belt inside the sector has been converted to a paved parking space to accommodate spillover vehicular parking. ((Fig. 4.2.4)

Fig. 4.2.4 Green Belt converted to paved parking

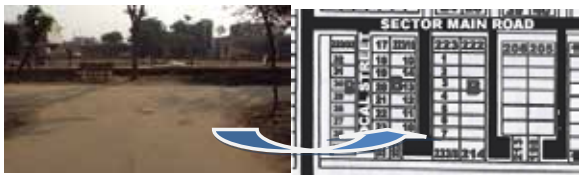
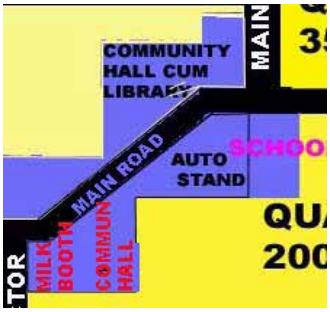


Fig. 4.2.5 Cul-de-sac of layout of inner sector roads

- Each quarter is designed with a cul-de-sac to eliminate any thorough fare making the residential core free unnecessary traffic. (Fig. 4.2.5)
- The placement of two community hall facing each other on the main road in the centre of the sector will encourage unnecessary outside traffic on the sectoral main road. (Fig. 4.2.6)
- Library which is a silent zone and low traffic generating is clubbed with community hall which generates medium-heavy traffic.



- Nursery school which is a desired pedestrian zone is placed

in the vicinity of the community hall.

- Milk booth which is a part of convenient shopping is placed on the sectoral main road and making the approach to these areas unsafe for the pedestrian.
- Convenient shopping is placed in the core of EWS quarters and safe zone. (Fig. 4.2.7)

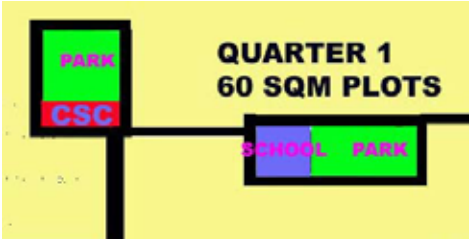


Fig. 4.2.6 Location of Community hall

- Commercial belt is not developed at present. Once it is developed unnecessary traffic from the commercial belt may use the sectoral main road for thorough fare turning the road into a nightmare for the pedestrian movement.

Fig. 4.2.7 Location of CSC with a peripheral road

4.3 Results and recommendations

- The commercial belt need not have any direct connection to the sectoral main road. The entry from the commercial belt side should be closed.(Fig.4.3.1)

Fig. 4.3.1 Denying access to the residential sector through Commercial belt

- Once the shifting of Greater Noida Industrial Development Authority Office takes place from the present site the green belt should be restored. (Fig.4.3.2)

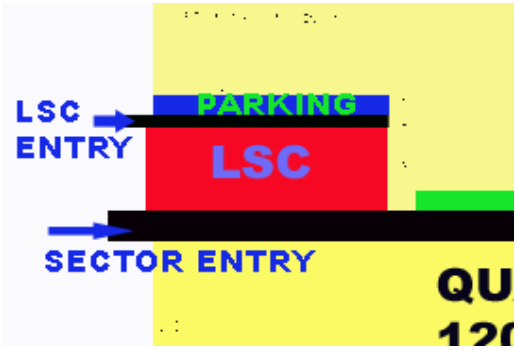


Fig.4.3.2 Peripheral Green belt of the residential sector used for parking

Fig. 4.3.3 Separate entry for the Residential Sector and LSC

- The vehicular entry to the local shopping centre should be closed from the sectoral main road.(Fig. 4.3.3)
- The Local Shopping Centre should have a separate entry apart from the main Sector entry. (Fig. 4.3.3)
- Direct vehicular approach from the sector to the local shopping centre should be restricted and pedestrianised. This shall lead to following upgradation of the sector:
  - Elimination of traffic congestion on sectoral main gate.
  - Elimination of thorough traffic from the sectoral main road.
  - It will also help to make the main sectoral road pedestrian friendly.
  - The green belt that is presently converted to accommodate spill over parking of the local shopping centre can be re-used as intended.
- The Community hall should be moved to the periphery of the sector. (Fig. 4.3.4) This step shall have the following benefits:
  - The traffic rush inside the sector due to various functions that take place in the community halls shall be eliminated.
  - This will also act as an additional step in eliminating unwanted traffic from the sector main road making it pedestrian friendly.
  - The direct access to the community hall from the residential areas of the sector shall be only pedestrian.

Fig. 4.3.4 Shifting of Community Hall

- Library can be allowed to remain at the present location i.e. at the centre easily accessible from each and every part of the sector.
- The primary school can also function well at the present location as the traffic rush from the main road has been eliminated.
- Streets can be now re-laid to be made friendly for pedestrians by adopting the following specifications.
  - Broad walkways with proper designing of kerbs to facilitate the movement of handicaps, elderly and the children.
  - Non-skid pavers to ease the movement of pedestrians.
  - The entry and exits of the walkways should services by ramp with proper gradient and handrail.
  - Pedestrain crossing points should be laid out along the streets and the walkway should be sloped to ease the transversement of the vertical distance.
  - Well laid out flower beds should run along the pedestrian walk trail to give a pleasurable experience to the users.
  - The situation is ripe to introduce cycle tracks and jogger's track along the sectoral streets.
- A pedestrian friendly street lay out shall encourage non-motorized transport inside the sector.
- People should be encouraged to use environment friendly means of transport inside the sector to preserve the environmental quality of their habitats.
- Use of bicycles shall eliminate the entire vehicular traffic inside the sector throughout the day except the morning and evening office hours.
- Starting public transport in the form of slow moving battery operated buses, cars, rickshaws etc. can go a long way to improving the environmental quality of the residential sector and making the streets friendly to the pedestrians.

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5.0 Conclusion

The above analysis highlights the problems of a well-designed and laid out residential area in terms of pedestrian movement. Pedestrian movement is always included as a component of street layout but the emphasis is generally to ease the vehicular flow. It is high time to classify the movement within an urban area in terms of vehicular and [pedestrian dominance. The following classification is proposed:

2) Arterial Roads
Vehicular traffic

3) Sub-arterial roads
Vehicular traffic
4) Collector Streets
Pedestrain traffic
5) Local Streets
Pedestrain traffic

Pedestrian friendly street layout should be given prime importance within the sector. The recommendations if implemented can make the residential area friendly for pedestrian movement and enhance the living environment of the sector.

REFERENCE

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