

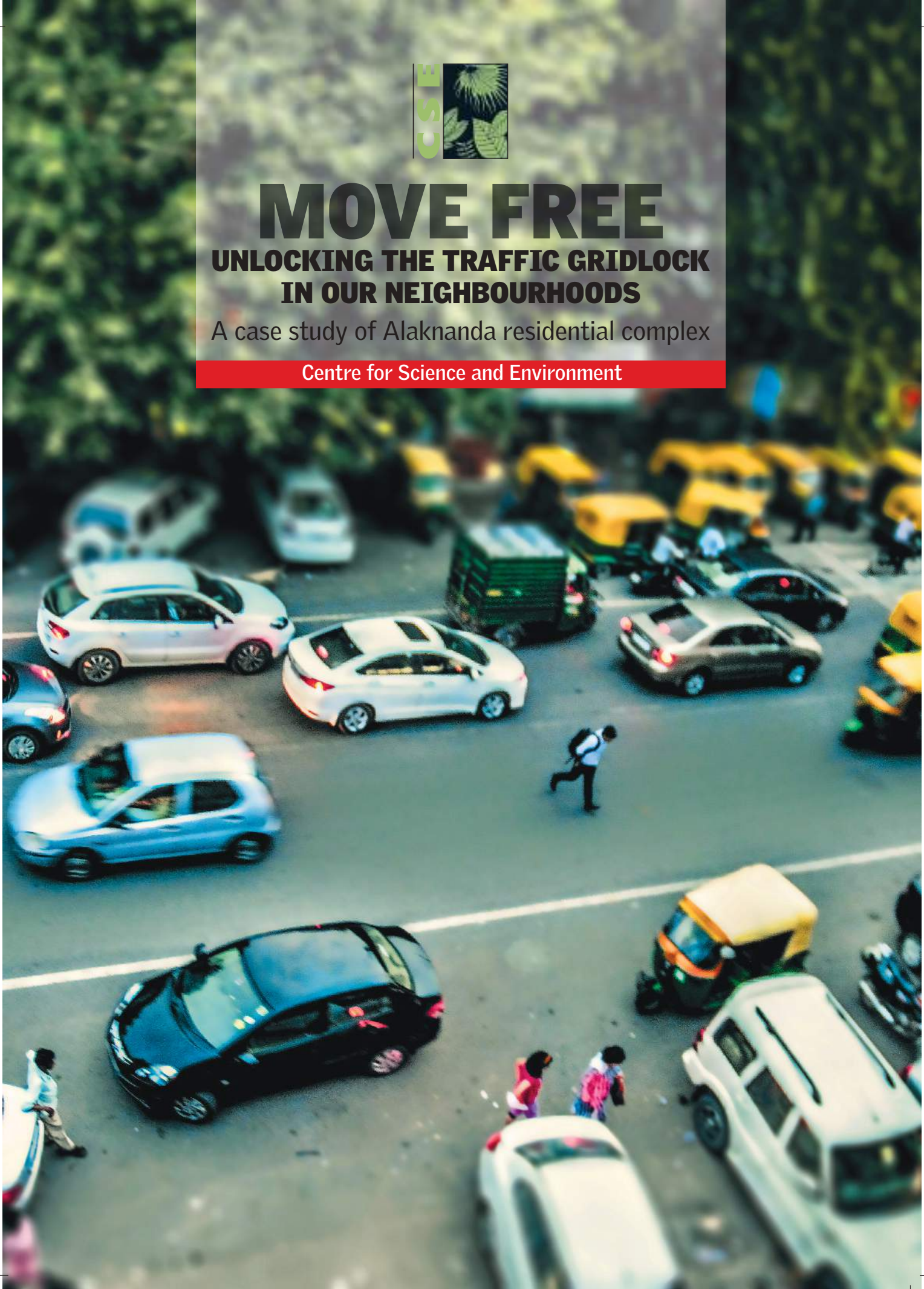


# **MOVE FREE**

## **UNLOCKING THE TRAFFIC GRIDLOCK IN OUR NEIGHBOURHOODS**

A case study of Alaknanda residential complex

Centre for Science and Environment



**Research and direction:** Anumita Roychowdhury

**Advisor:** Ashok Bhattacharjee

**Researchers:** Ruchita Bansal, Usman Nasim

**Inputs:** Avikal Somvanshi

**Editor:** Arif Ayaz Parrey

**Design:** Ajit Bajaj

**Production:** Rakesh Shrivastava, Gundhar Das

**Concept plan and design:** Mriganka Saxena

We are grateful to Shakti Energy Foundation ([www.shaktifoundation.in](http://www.shaktifoundation.in)) for its support to the programme on clean air and sustainable mobility. However, the views expressed and analysis done in this document do not necessarily reflect the views of the Foundation. The Foundation also does not guarantee the accuracy of any data included in this publication, nor does it accept any responsibility for the consequences of its use.

We are grateful to the Swedish International Development Agency for institutional support.

We would like to especially thank the volunteers who had participated in the surveys.

**Citation:** Anumita Roychowdhury 2015, *Move free: Unlocking the traffic gridlock in our neighbourhoods*, Centre for Science and Environment, New Delhi



© 2015 Centre for Science and Environment

Material from this publication can be used, but with acknowledgement.

*Maps in this report are indicative and not to scale.*

Published by  
Centre for Science and Environment  
41, Tughlakabad Institutional Area  
New Delhi 110 062  
Phones: 91-11-40616000  
Fax: 91-11-29955879  
E-mail: [cse@cseindia.org](mailto:cse@cseindia.org)  
Website: [www.cseindia.org](http://www.cseindia.org)

Printed at Multi Colour Services



# **MOVE FREE**

## **UNLOCKING THE TRAFFIC GRIDLOCK IN OUR NEIGHBOURHOODS**

A case study of Alaknanda residential complex

Centre for Science and Environment

# Why this study?

Choked roads, polluted air and road injuries are but a few symptoms of the severe and crippling mobility crisis in Delhi. Polluted air snuffs out one life every hour. Studies carried out by the Central Pollution Control Board and National Chittaranjan Cancer Research Institute have shown that every third child in Delhi has impaired lungs. This can hardly be called unexpected in this polluted city with gridlocked traffic where the impact of vehicular pollution is maximum near roadsides and within 500 meters from any road. More than 55 per cent of Delhi's 17 million people live within this highly exposed and toxic zone. The city also records the highest fatal road accidents among all cities—an average of five road accident deaths per day. This is not acceptable and needs urgent attention and solutions.

A staggering 25 million travel trips are generated daily in Delhi. How the teeming millions decide to travel will decide the liveability of this city. The growing dependence on personal vehicles is making the city even more gridlocked and polluted. Over the last three decades, there has been an unprecedented growth in the number of motor vehicles, which is now hitting the mark of about 8.8 million. This is more than the number of vehicles in the three mega cities of Mumbai, Kolkata and Chennai put together. According to the *Delhi Statistical Handbook 2014* every second household has a two-wheeler and every fourth household has a car. The city is adding at least 1,400 vehicles to its roads every day. Mass transport systems have miserably failed to keep pace with the growing travel demands. Official statistics from RITES show that traffic volumes have far exceeded the designed capacity of most roads in Delhi.

Yet our transport policy is obsessed with increasing speed and ensuring seamless vehicular movement on arterial roads and major traffic corridors by removing signals, making flyovers, barricading medians to stop people from crossing where they need to, and creating underpasses to transport volumes of car traffic at speed. This only creates incentive for more car travel. It is not possible to curb killer air pollution and congestion if the roads continue to get designed in ways that stoke explosion in traffic volumes without restraints.

A key missing link in the current top-down approach to urban planning and road design is the absence of participatory local area frameworks to enable local communities to plan access to services in the neighbourhoods. Such frameworks can also improve overall connectivity and cut down demand for travel and car usage at source. Neighbourhoods are plunging deep into the mobility crisis and have no clue how to reorganise their roads and public spaces for the well being of all. More local level participatory planning is needed to arrive at the right solutions that are implementable and sustainable.

Such an approach will hopefully make a huge difference. After the full implementation of all phases of Delhi Metro about 80 per cent of Delhi will be within 400 meters of some metro station. If all neighbourhoods are retrofitted with good walking and cycling infrastructure and good and intermediate public transport access with controls over parking, dependence on cars can be reduced dramatically. Thus, local area action is critical to transform the city.

**A staggering  
25 million  
travel trips are  
generated  
daily in Delhi.  
How the  
teeming  
millions decide  
to travel will  
decide the  
liveability of  
this city**

## Spotlight on local area crisis

Local roots of congestion and its impacts across residential neighbourhoods are not very well understood. But symptoms of this crisis are visible. On a daily basis, it is an ordeal for most residents to move out of or return to their homes during peak hours. Personal vehicles have not only taken over public spaces for parking but also the narrow local lanes. Choked local streets, ugly neighbourhood brawls over parking, lack of public space for recreation in neighbourhoods and air pollution are adding to the trauma, stress and ill-health of residents of Delhi. Even in developing city-wide infrastructure, solutions will have to be customised for local areas to reduce traffic at source. Local residents need to be part of the conversation now to build support for people-friendly road designs and access, public transport strategies and car restraint measures.

Local solutions are not yet clear to many. This has led to serious tension and protests across neighbourhoods. Often such conflicts end up pushing partial and sometimes inappropriate solutions. In several localities across Delhi, people have moved the courts to get relief. Residents of Greater Kailash Part II (GK-2) in South Delhi had protested when Savitri commercial complex was being made. In most areas, local congestion is so severe that any proposal of new commercial or mixed-use development in neighbourhoods draws angry protest for fear of those becoming traffic magnets. Vasant Kunj, yet another South Delhi residential colony, has protested against the widening of road and cutting of trees, and increased traffic volume. There is tension between the urban villagers of Shahpur Jat and the rich residents of Panchsheel Park over a foot over-bridge. While the rich are not allowing the use of their service lane for its construction, all pedestrians in the neighbourhood need this to save lives while crossing the heavily congested outer Ring Road. These are all symptomatic of public policy failure in addressing integrated street design and management to cater to the needs of all road users and special requirements of local areas.

Alaknanda is one such prominent residential area in South Delhi that has witnessed several protests and resident welfare associations (RWAs) have moved courts many a time—Public Works Department's (PWD) median verge on its narrow and congested road and fear of more traffic from a proposed mall in the area being one among other concerns. Some street level changes were carried out earlier, including installation of traffic lights near the market, and paving of footpaths etc. after a fatal accident near the market a few years ago. Recently, Alaknanda hit the news headlines once again for public protest against the PWD's project of one-foot high road dividers between Balwant Rai Mehta School and Guru Ravidas Marg, just beyond Alaknanda Market. PWD has justified this engineering intervention on grounds of regulating traffic and for installing street lights. The plan provides for only three U-turns. Residents are unhappy because the divider leaves a two-lane space on either side, one of which is used for parking vehicles and just one lane is available for vehicles to pass. The U-turns have increased detours and made turning difficult. This is inconsistent with the street design guidelines of UTTIPEC that has not recommended central verge in collector roads, unless justified, and has asked for frequent crossing facilities for pedestrians. Three schools and RWAs in GK-2 and Alaknanda have challenged the construction of the median verge.

While the focus has narrowed down '*to have or not have the median*', it is clear from

**Local residents need to be part of the conversation now to build support for people-friendly road designs and access, public transport strategies and car restraint measures**

**A range of solutions related to pedestrian paths, frequent safe crossings, traffic calming, and carriageway planning for collector roads need to be implemented**

CSE's assessment that local solutions will emerge from total and integrated street design and management. This will have to be addressed within the framework of complete street design that caters to all road users. It may be noted that the *UTTIPEC Street Design Guidelines* have recommended a range of solutions related to pedestrian paths, frequent safe crossings, traffic calming, and carriageway planning for collector roads that need to be implemented in totality. The residents must take this opportunity to seek the full range of solutions to have people-friendly streets.

**Missing link in the congestion grid**

The current practice is working against the principle of integrated street network management. Increasingly, street hierarchy and networks are becoming dysfunctional. In the absence of proper network planning a few streets begin to collect and funnel large volume of local traffic to the arterial roads. That creates serious congested bottlenecks. Current policy ignores well-designed interconnected network of streets and street density including neighbourhood connectors for efficient dispersal of traffic and improved walking and cycling access. This is needed to allow different land uses to coexist to meet the daily needs of residents within walkable access. This can allow integration of all modes of travel including vehicular, walking, cycling and public transport at the local level to cut down car trips and allows efficient dispersal of traffic through dense street network.

All residential areas are major generator of traffic and they are also vulnerable to massive through-traffic. Neighbourhood level connector roads that have 18-24 m wide right of way are smaller than arterial roads. But these are increasingly becoming congested as they are forced to function as arterial/sub arterial roads carrying large volume of through-traffic. This creates severe choke points all across, making colonies alongside unliveable. Moreover, impossibly large block sizes of residential colonies have increased distances to the nearest public transport nodes and services that discourage people from walking and often make them captive users of cars.

Carriageway spaces are not uniformly available due to unorganised parking and encroachment. Inadequate and ill-designed walking spaces discourage walking. This adds to chaos and confusion. A broad reconnaissance survey of various colony roads of the city clearly show visible problems of haphazard parking on roads, absence of proper usable footpaths, chaotic traffic condition, unorganised and unregulated traffic movement, parking encroachments and private gardens on footpaths have seriously compromised the quality of life of these neighbourhoods. The ever-increasing demand for on-street parking occupies almost half to one-third road spaces and is further affecting movement of traffic and safe movement of pedestrians/cycles.

Vehicle-centric design make the roads even more unsafe. CSE's safety audit of selected arterial roads in Delhi exposed how fatal road accidents have increased in the city due to prioritisation of high-speed roads. This highlights major implementation and enforcement deficiencies involving various procedural and coordination issues related to road design and usage. This is further aggravated by poor public transport access and lack of car restraint measures. There is also no local governance system to restrain unlimited parking encroachment and multiple car ownership and that defeats all solutions.

## Chart the solutions

In view of this, CSE has decided to carry out rapid assessment of local area challenges and solutions in different land-use areas to deepen policy understanding of the solutions. This first in the series on ‘*know your neighbourhood*’ shows how lack of local area planning, flawed urban design, ill-designed road network, poor connectivity, poor enforcement, and absence of restraints block the scope of action needed to cut pollution and congestion. This study focuses on the Alaknanda area in South Delhi that is surrounded by GK-2 and Chittaranjan Park. This micro level study is a qualitative and quantitative assessment of what is contributing to congestion and chaos, and compromising road safety and public health in the area.

This study has assessed the state of the street, how safe it is for walking and crossing, impact of parking encroachment on the carriageway, footpath and public space, and public transport access. Over a period of time incremental and disconnected engineering interventions have happened. But it is clear that roads and mobility cannot be fixed with piecemeal measures but needs an integrated street design and management solutions to make a difference.

This study has proposed less intrusive solutions as a model acceptable to the community and concerned agencies to replicate in other similar situations. The solutions have been demonstrated through a concept plan that includes improved street design and integrated street management for all road users, improved connectivity, and enforcement of organised and priced parking to cut the chaos.

Yet another objective of this study is to sensitise the local community as well as the policy makers about the potential of local action that must complement and support city-level action to obtain the full range of solutions. While local level changes can help to alleviate the pressure in the area, the real solution will only be possible if city-wide action is initiated to scale up integrated public transport, ensure safe access, and implement car restraint measures like a parking policy and taxation measures.

Only deeper understanding of local challenges and solutions can help to build public support for appropriate solutions. Change is possible only with public support.

**Safety audit of selected arterial roads in Delhi exposed how fatal road accidents have increased in the city due to prioritisation of high-speed roads**

## Alaknanda case study



Source: Google Earth

# Unique challenges of Alaknanda

## About the study area

Alaknanda residential complex is a prominent residential neighbourhood in South Delhi. It has one collector road passing through it, connecting two important arterial roads—Outer Ring Road in the north and Guru Ravidas Marg in the south. It is flanked by residential colonies, market and schools, mostly with access from this road. Alaknanda road is the only connector between the two arterial roads for long distance through-traffic. It is also the only major access road to the colonies, market and schools of the area. The area itself generates a large volume of vehicular trips.

For the purpose of this study, a stretch of about 800 m, from the Tara Apartment T-junction to St. George School crossing, has been considered. This stretch is flanked by five residential societies including Nilgiri Apartments, Yamuna Apartments, Godavari Apartment, Gangotri Apartment and Tara Apartment. Altogether, there are about 1,125 residential flats along the stretch. In addition to this there are three schools—New Greenfield, St. George and Kalka Public. There is also a prominent market. However, the number of residential apartments and units in the entire influence area is much higher.

**Gridlocked neighbourhood:** Alaknanda along with its surrounding neighbourhoods of Chittaranjan Park, GK-2 and Govindpuri form a large block size that is surrounded by four major arterial roads that include Mehruali-Badarapur road, Outer Ring Road, Guru Ravidas Marg and Lal Bahadur Shastri Marg. As these arterial roads remain congested and without efficient dispersal network of their own, the Alaknanda road becomes the conduit of through-traffic from these arterial roads and creates enormous traffic pressure (See figure 1: Road network around Alaknanda). All these arterial roads are expected to experience massive increase in traffic volume in the future.

Moreover, new infrastructure created to facilitate the rapid movement of large volumes of long-distance traffic in the catchment of this area is further aggravating the chaos due to traffic. PWD is reported to have said that with the opening of the Sarita Vihar underpass, traffic on some interior roads is expected to increase, one of which is the stretch between W Block of GK-2 and Alaknanda.

**Table 1: Approximate number of residential flats along the road in the study area**

Apartment	Number of flats
Nilgiri	448
Yamuna	195
Godavari	114
Gangotri (Pocket B)	208
Tara	160
Total	1,125

Source: CSE survey

A rapid volume count survey was carried out by CSE in July 2015 at two spots on the Alaknanda Road stretch (from Tara Apartment intersection to St. George's School crossing, i.e., 800 m) to measure the Passenger Car Unit (PCU)/hour and the Peak Hour Factor. These parameters help to assess the current situation of the road—whether the usage of road is above or below its vehicle carrying capacity. This was done on a working day when the schools were open. The main idea was to include the volume of school buses that comes during the morning hours. The survey was carried out for two hours in the morning (7-9 a.m.) and two hours in the evening (5-7 p.m.). The evening survey also gathered the data of cars of the residents and shopkeepers of Alaknanda returning to homes from work.



## HOW THIS STUDY WAS DONE?

- i) Delineation of the study area based on walk accessibility criteria around the market, schools etc.
- ii) Collection and analysis of data on parking, traffic flow, street components, community preferences, market association's opinion and mapping of the complex with the help of Google Earth, activity survey and opinion surveys.
- ii) Framing of a broad proposal with network plan and circulation system for the study area for safe walkable accessibility for all categories of people and smooth and orderly movement of traffic.
- iii) A detailed conceptual design for the Alaknanda road and adjacent roads around the market with "before" and "after" view of proposed development.
- iv) Assessing provisions of parking to provide an "on street parking cap" based on the street design to decide the long and short-term parking management with pricing strategies.
- v) Action Plan for implementation and management of the system.

**Figure 1: Road network around Alaknanda**



Source: Google Earth

This survey has shown that in Alaknanda the PCU is already more than 2,500/hour while according to the IRC handbook the PCU on a collector road should be around 900/hour. The actual number of vehicles counted during the peak hour was more than 2600. This is close to three times higher than the designed capacity. Cars and two-wheelers dominate the traffic. Time taken to cross this stretch during peak hours was more than doubled.

**Available right  
of way should  
be reorganised  
for all road  
users for easy  
walkable  
access and to  
restrain  
unlimited use  
of road space  
for parking**

Moreover, transportation experts also calculate the Peak Hour Factor (PHF) to indicate the congestion pressure. This is descriptive of trip generation patterns and may apply to an area or portion of a street and highway system. The PHF is typically calculated from traffic counts and considers the peak hour volume, and the peak volume at 15 minute intervals. According to the Highway Capacity Manual, the PHF for different conditions are as follows—0.95 for congested condition, 0.92 for urban areas and 0.88 for rural areas. Accordingly, the factor for the Alaknanda road is 0.95, which clearly indicates congested conditions. But such an approach of estimating congestion factor should not be read for the perverse logic of creating more road space for motorised traffic. Instead it should give clear indication that the available right of way should be reorganised for all road users for easy walkable access and to restrain unlimited use of road space for parking. Only this can help to improve people carrying capacity of the road.

Moreover, the RITES study of 2010 has projected massive increase in traffic volume in the catchment of the study area by 2021. It has warned that some of the local roads in the vicinity will witness increase in volume of traffic that may turn these into arterial roads with more than 5,000 PCUs by 2021. This will have severe cascading effect on the Alaknanda road that will further aggravate the local problem.

Due to poor internal circulation planning, outflow and inflow of traffic from the adjacent residential complexes along the road aggravates congestion that is already saturated with through-traffic during peak hours. Along this stretch, all residential apartments have their own separate gates for entry and exit.

This only indicates that local solutions will have to look at ways to increase people carrying capacity of existing roads and not vehicle carrying capacity. More car influx will occupy more road space but will carry miniscule travel trips. But redesigned streets for all road users will improve throughput of people.

**High local pollution:** It is well known that Delhi is one of the most polluted cities in the world. The levels of tiny particles that go deep inside the lungs, along with nitrogen oxides and ozone are rising steadily in the city. Last winter the particulate levels were three-four times the standard. Peak levels have hit 9-10 times the standard. Global Burden of Disease estimates have shown that air pollution is largely responsible for strokes, heart problems, lung diseases and cancer. New studies have shown a link of air pollution with organ damage, diabetes and brain development. Given such health impacts, it is very important that direct exposure to pollution, especially vehicular pollution, is reduced. Vehicles emit extremely toxic fumes and diesel emissions in particular have been reclassified as Class I carcinogen—same class as tobacco smoking—for its strong link with lung cancer.

There is no official air quality monitoring in Alaknanda. CSE carried out limited monitoring during the winter of 2014-15 to assess the exposure levels. The results have shown high peak averages for PM 2.5. Eight hourly averages during the day show 322.5 microgram/cum on 21 November 2014, about 570.3 microgram/cum on 14 February 2015, and 329 microgram/cum on 15 February 2015. Night time pollution is very high due to cold and calm weather that traps pollution very close to the ground level. This has been as high as 787 microgram/cum. The standard for 24 hour average is 60 microgramme per cum. The real exposure is much higher. This is a serious public health issue.

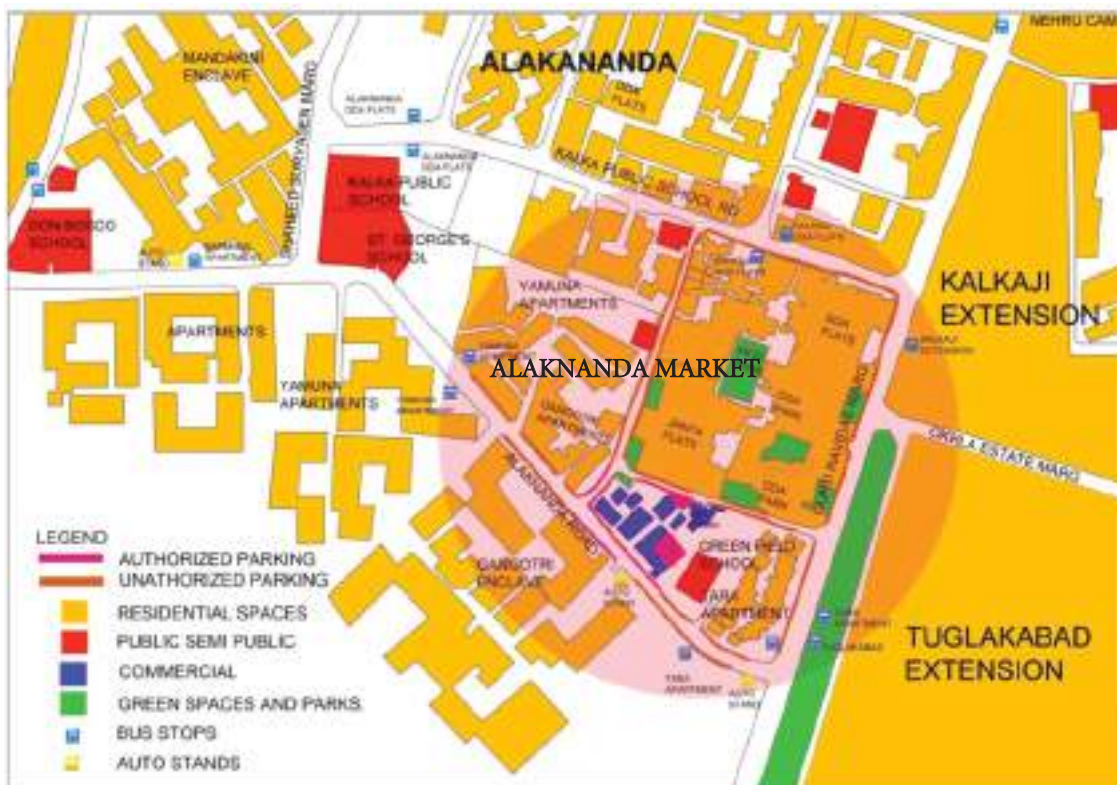
**Mixed use without appropriate design:** This dense residential colony has a market and several schools in its vicinity. Four schools open directly to the road. The market is closed on Tuesdays. Having schools and markets within walking distance of a residential colony is a good urban design principle. But the benefits of this get compromised when, without the appropriate design for access and parking, these utilities become magnets of chaotic traffic and unorganised parking.

Schools-related traffic congestion occurs during school hours (morning around 8-10 a.m. and evening around 3-5 p.m.). Both unorganised bus parking and cars picking-up and dropping-off near school campuses aggravate local congestion. There is no provision for car parking or bus bays inside the schools, even for the staff. They usually park their vehicles on the Alaknanda road. School buses are also parked outside the school. No road design solutions have been thought through to address this.

Similarly, the market is a magnet for traffic and parking. Alaknanda market caters largely to the needs of the nearby residential colonies like GK-2, Kalkaji Extension and C.R. Park. It consist of around 84 shops, mostly grocery stores, fast food outlets, pharmacies, a milk booth, cosmetic stores, clothing stores and a few offices (LIC office, post office etc). There are some banks and offices in the vicinity that draw daytime visitors who do long-term parking.

**Parking challenge:** Factors like multiple car ownership in the residential complex, visitors parking near schools and the market etc. contribute enormously to the pressure

**Figure 2: Alaknanda market and the surrounding influence area**



Source: CSE

**Factors like multiple car ownership in the residential complex and visitors parking near schools and the market contribute enormously to the pressure on the road**

on the road. Most societies in the residential complexes provide one parking space for each flat inside the complex. It has been reported that in a couple of colonies the available parking space is less than the number of apartments. This leads to spillover. The existing DDA flats behind the market have been provided only with scooter parking as they were designed in the 1980s. New demand occupies road space for parking personal vehicles. A majority of the flat owners have multiple cars that cannot be contained within the complex.

There is also a problem of residents from other neighbourhoods that are space constrained parking on this road. The local parking contractors have pointed out that residents from nearby Tughlakabad, that has serious space crunch, largely park on Guru Ravidas Marg, but there is some spillover on the Alaknanda road around Tara Apartment. Free parking encourages this trend.

### **Parking pressure on Guru Ravidas Marg**

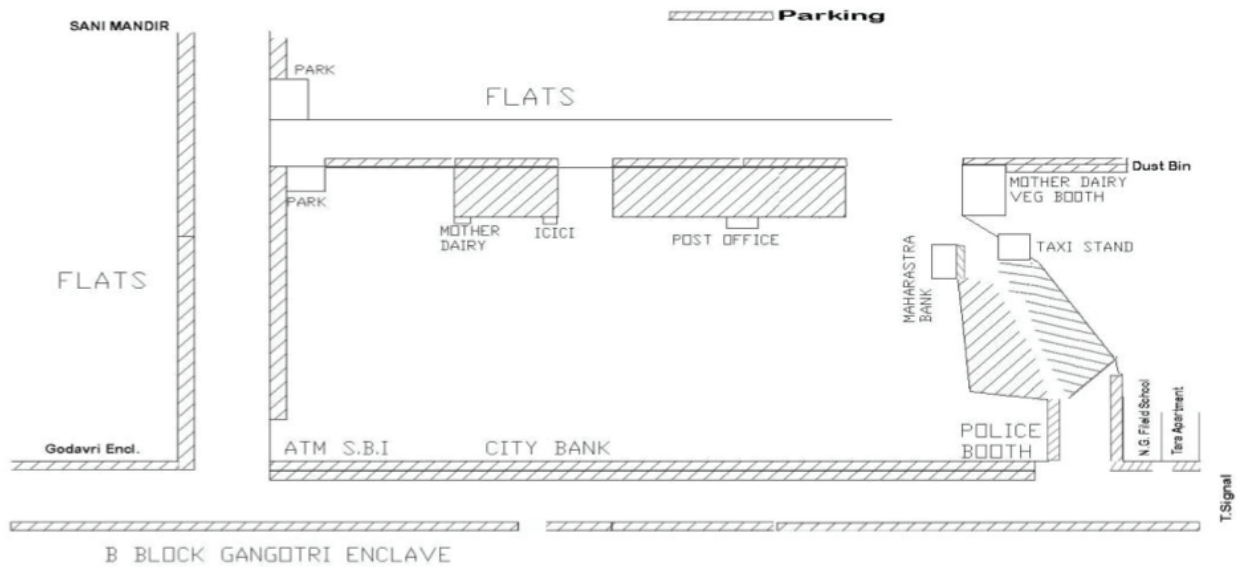
**Parking availability:** The Alaknanda market parking area is under Municipal Corporation of South Delhi (South MCD). The capacity of legal/notified surface parking area in and around the market is around 200 cars limited to on-street parking on roads adjacent to the market and the parking space within the market (*see Figure 3: Legal parking provided along the Alaknanda market by South MCD*). The surface parking timings are 14 hours from 8 a.m. to 10 p.m. every day. The map shows the existing parking space along the market designated by South MCD. There are two off-street parking areas along the stretch located inside the Alaknanda market.

However, the parking goes much beyond the notified space and stretches up to a kilometre on the main Alaknanda road. In fact, the entire stretch from Tara crossing to St. George School has been found to be occupied with parked cars on both sides. During the activity survey in August 2014, a maximum of 630 parked cars were noted at one time in the study area. About 40 per cent of them were around the market place. This number can vary from time to time during the day. This means the area allows 3.15 times higher parking than what is legally provided. Parking demand around the market place comes from shoppers, shopkeepers, DDA flats behind the market and spillover parking from apartment complexes.

#### **Congestion on Guru Ravidas Marg**



**Figure 3: Legal parking space provided along the Alaknanda market by South MCD**

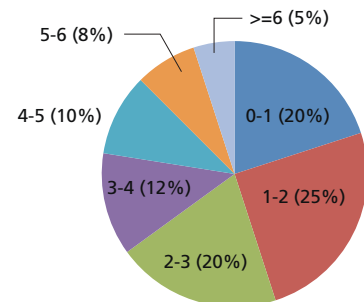


Source: MCD

**Where do people come from?** It is necessary to know the origin and destination of the trips to the Alaknanda market. Origin is defined as the place where the trip begins and destination is defined as the place where the trip ends. An origin-destination survey was carried out in the market to know the influence zone or the catchment area of the market.

The survey indicates that a quarter of the visitors are from within 1-2 km and another 20 per cent from within 2-3 km. Overall, around 77 per cent of the total shoppers come from within a radius of 4 kms from the market. Therefore, the catchment area largely includes the nearby residential colonies. Shoppers are dominantly coming from nearby residential societies and from areas like Govindpuri, Greater Kailash, Tughlakabad etc (see Figure 4: Percentage share of trip length of visitors to the Alaknanda market).

**Figure 4: Percentage share of trip length (km) of visitors to the Alaknanda market**

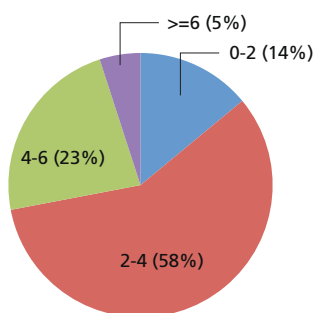


Source: CSE survey

**Parking demand from shopkeepers and shoppers:** The majority of the visitors—about 48 per cent—come by car, 23 per cent by two-wheelers, 6 per cent by public transport/autos, and the rest walk. If we consider only shopkeepers then as many as 51 per cent come by cars and 38 per cent by two-wheelers. This only shows the enormous potential of converting most of these short distance motorised trips to walking and non-motorised trips. This, combined with an effective pricing strategy, can reduce parking pressure significantly.

There are a total of 84 shops in the Alaknanda Market. If we consider only the shopkeepers about 14 per cent of the total shopkeepers are from within the Alaknanda area. A large numbers of shopkeepers—as many as 58 per cent, come from within a radius of 2-4 km from the market. According to the shopkeepers association, a majority of shopkeepers are from areas adjacent to Alaknanda that include Sangam

**Figure 5: How far the shopkeepers come from**



Source: CSE survey

Vihar, Tughlakabad, Okhla, Govindpuri, Kalkaji depot etc. (see Figure 5: How far the shopkeepers come from). This only points towards the fact that improved walking and cycling access and better intermediate public transport connectivity can reduce parking pressure from car and two-wheeler users. Parking has spread from inside and adjacent to the market to quite far from the market. The spillover effect is quite substantial.

**People carrying capacity of the road declining:** While the volume of traffic on the road is increasing steadily, the people carrying capacity of the road is reducing. The CSE survey shows that as many as 84 per cent of the car users visiting the Alaknanda market travel alone, showing very poor car occupancy. This wasteful use of cars leads to enormous congestions in meeting commuting needs of a handful of people. It is already known in Delhi that cars and two-wheelers occupy 90 per cent of the road space but cars carry less than 15 per cent of the travel trips. Buses occupy 5 per cent of the road space, but carry more than 40 per cent of the travel demand. Immediate engineering interventions are needed to create more walking space and public transport access and also parking restraints and pricing to facilitate people’s movement and reduce the pressure of cars.

**The challenge of night parking:** CSE surveyed night parking end-to-end on the stretch and found that between 11.30 and 1.00 a.m. 535 cars were parked on the Alaknanda road and 166 cars in the parking lot around the market. Further, 173 cars were parked on the road near the temple. Density was higher near the temple and near entry gates of the apartment blocks. Tara Apartment had double parking. Several cars with covers on them were found near the market. These seem to be long-term parkers. Parking attendants informed CSE that there are several cars that have remained parked for years and months. The nature of night-time parking shows the visible impact of rising car ownership and mainly multiple car ownership in the area.

**ROAD SPACE OCCUPIED:**

**By cars and two-wheelers**  
**90 per cent**

**By buses**  
**5 per cent**

**TRAVEL TRIPS CARRIED:**

**By cars**  
**15 per cent**

**By buses**  
**40 per cent**

**Parking pricing:** Even though MCD has notified a legal parking area around the market with an approximate provision of 200 parking spaces, there is no parking fee. It is reported that at some point MCD contractors used to collect parking fee but this practice has been discontinued. The recently introduced rate of Rs 20 per hour by MCD South has inexplicably not been implemented here. However, in practice there are informal parking operators who are collecting Rs 10 per parking in front of the market. Free parking is inciting unlimited car ownership and parking in the area. Nearly the entire available road and public space around the market have been saturated by parking. Without restraints it will be impossible to implement solutions and control the pollution and congestion mayhem in the area.

**Informal market in parking spaces:** An interesting phenomenon has been observed in this area. There is a serious space crunch behind the market and there is clamour for space among the residents of Janata Flats to find space for parking. These flats do not have car park areas within the complex. As a result, a thriving informal market in residential car parking has emerged behind the market and near the temple. Residents can park their cars for the whole day for a fee of Rs 1,500/ month for 24-hour parking and Rs 1,000/month for only night-time parking. The place is barricaded and there is a security guard. During the CSE survey, about 50 such cars were parked at night. This only proves how limiting and organising parking supply can help create a market that can earn revenue not only for the contractors but also for the government. Use of

public spaces for both residential and commercial parking should not be free. Suppose all the 870 cars that were seen parked in the public space during night pay a minimum of Rs 1,500 a month, more than Rs 13 lakh per month and Rs 1.5 crore annually can be generated only from this small stretch. The earning potential of the entire road is much higher. This only brings out the revenue and earning potential of priced parking that is needed not only to control infinite increase in parking demand but also use of this revenue for local area development for the larger benefits of the residents.

**Parking inconvenience reported by both motorised and non-motorised users:** Chaotic and mismanaged parking also adds to the hassle of parking. About 60 per cent of the respondents park their vehicles inside and adjacent to the market, about 34 per cent near the market and about 6 per cent at a distance from the market. As many as 75 per cent of the respondents said they are not satisfied with the parking situation and 80 per cent said the parking facility should improve. Traffic chaos and choked parking spaces have increased the cruising time for the drivers to find parking spaces. This also translates into additional fuel loss.

Chaotic parking and traffic affect non-motorised transport the most. There is no dedicated space for cycle parking. As many as 64 per cent of cycle users are dissatisfied with the parking situation. This is a serious barrier to improving non-motorised and walking access to the market to reduce the parking pressure. About 75 per cent of the respondents are not satisfied with the present parking as well as the traffic scenario prevailing in the area. But the non-motorised transport respondents believe that for them the situation is better than the vehicular parking condition.

**Poor public transport accessibility:** The public transport accessibility level to the area is very poor considering that only two bus routes originate in the area and no other bus

***Unorganised parking all around the market***

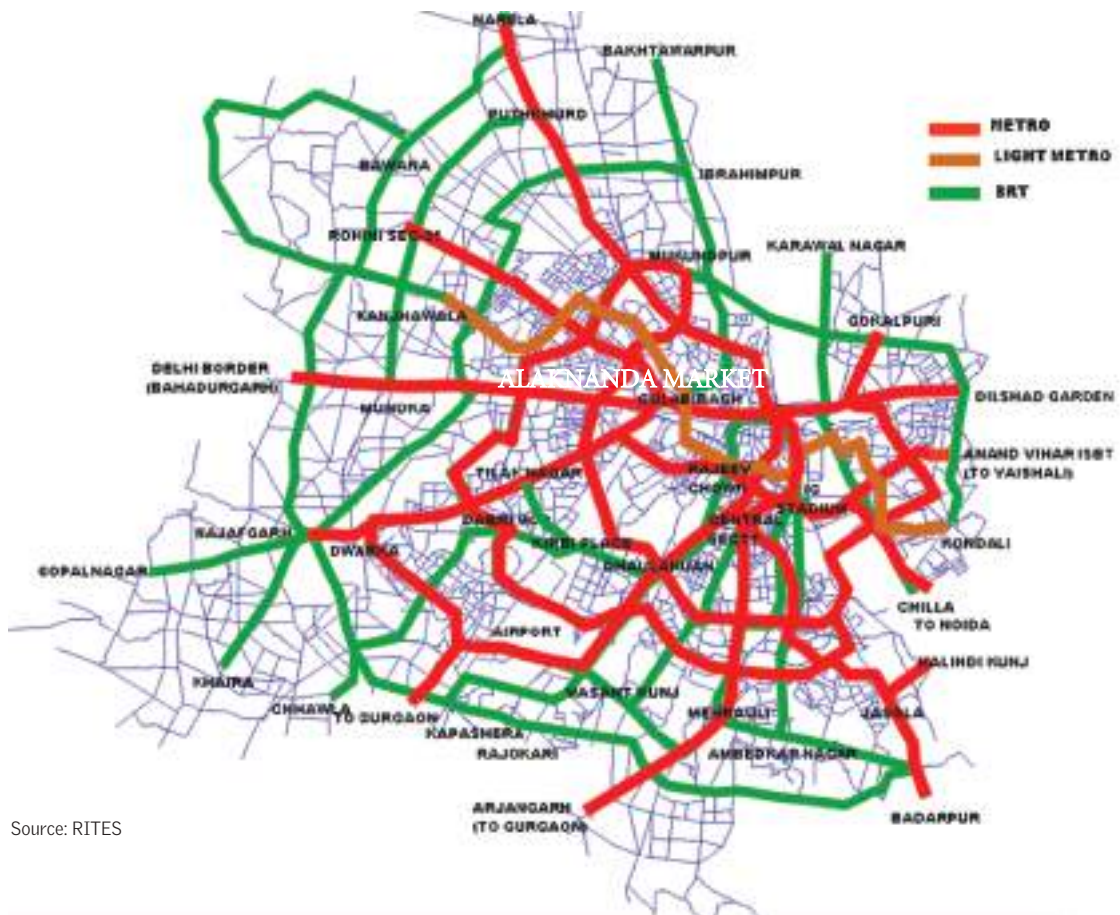


routes pass through the area. The nearest metro station at Govindpuri is about three km away, Nehru Place and Kailash colony stations are also close by but feeder bus services are not available. Walking infrastructure is also deficient. This situation is mainly responsible for more car use for both long and short distance trips. Even though Alaknanda and Kalkaji areas have bus services but the frequency and quality of the service is poor and makes it difficult for people to use it. Some bus services have also been withdrawn.

This will have to change significantly to improve public transport access to the area. The public transport network planned for 2021 shows major transport linkages by 2021. This includes extensive network of bus rapid transit (BRT) and metro services. Once the metro route on Outer Ring Road becomes fully operational there will be several metro stations within a 3-5 km radius. It is important to build frequent feeder alignment with these stations to allow improved access to this area. (see Figure 6: Development of Integrated Public Transport Network for 2021).

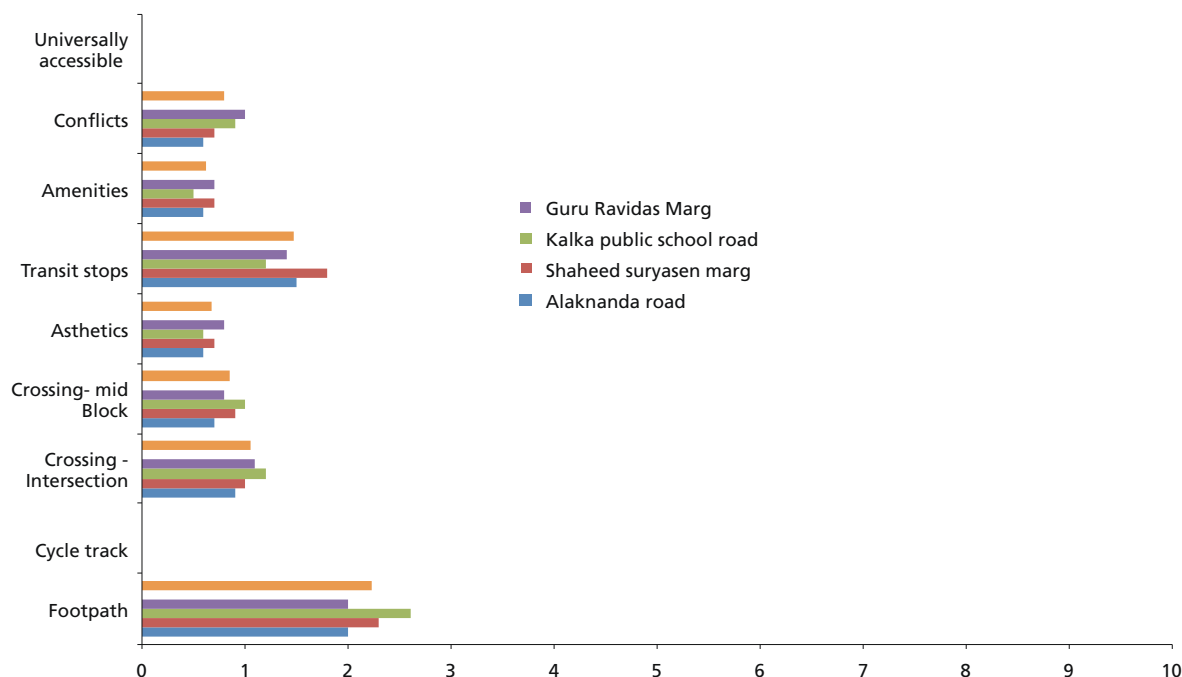
Safe infrastructure for walking and cycling will also reduce air pollution and carbon footprint enormously. Local solutions will have to be supported by larger regional and zonal connectivity and also improved traffic alignment and dispersal and better management of the arterial roads flanking the zone that include Anandmayee Marg, Guru Ravidas Marg etc. to decongest the area.

**Figure 6: Development of Integrated Public Transport Network for 2021**



Source: RITES



**Figure 8: Ranking of road segments based on the safety audit**

Source: CSE

**Poor walkability and unsafe roads:** CSE has also carried out a walkability and safety audit to understand and suggest design solutions to improve safety, convenience, aesthetics and overall attractiveness and well-being. This assessment was based on quantitative and qualitative indicators that also allowed room for discretion of the assessor and users. The audit was carried out in accordance with a checklist of parameters prepared by CSE, this checklist was based on the street design guidelines of UTTIPEC. These guidelines are expected to be followed by the city authorities, but are not mandatory. The audit identified deficiencies and maintenance concerns, and proposes solutions. (See Figure 7: Ranking of road segments based on the safety audit).

### Details of the safety audit

The safety audit considered eight criteria:

- Engineering and design features of footpaths and cycle tracks (height, width, material, continuity, segregation from carriageway, obstructions, and lighting)
- Crossing-intersection and mid-section (signal time, signage, markings, continuity/barrier-free access and traffic calming measures)
- Encroachments/impediments on footpaths (permanent or temporary structures and parking)
- Design features for transit/bus stop/shelter (height, boarding/alighting time, clear width and crossing facility)
- Amenities (toilets, vendor spaces, trees, lighting and seating)
- Conflicts (between buses, motor vehicles, non-motorised transport—non-motorised transit (NMT), pedestrians etc)
- Safety features (lighting, dead width and public spaces)
- Aesthetics (design qualities of street furniture/features)

Detailed maps and checklists were used for scoring. Field surveyors rated the selected

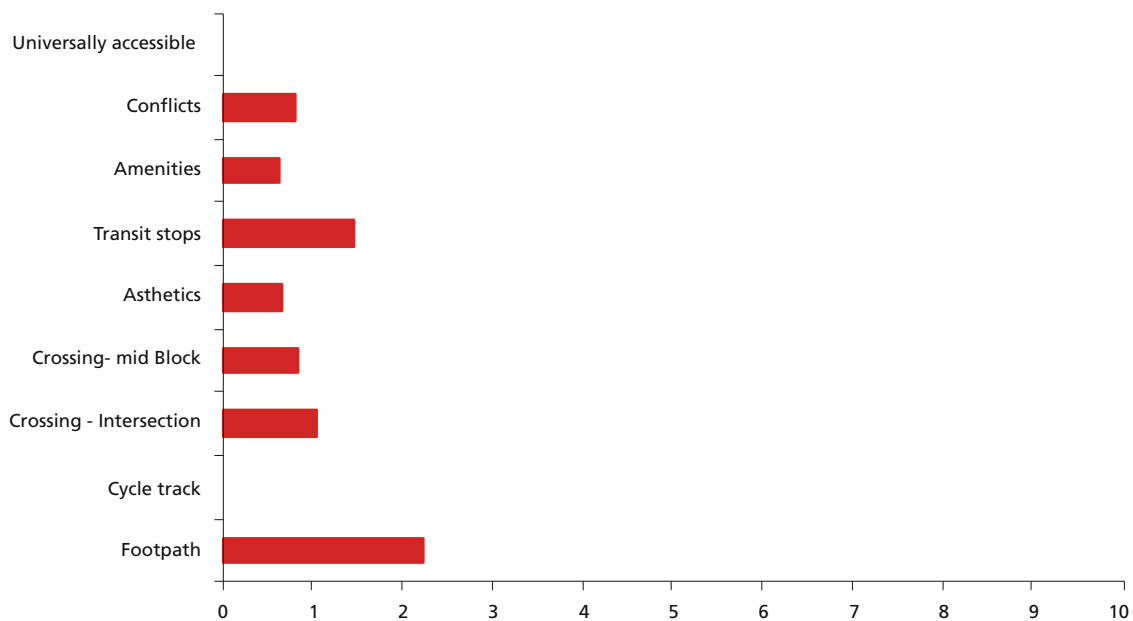
road stretches on a scale of 1 to 10 for each indicator in every section. The corridor was divided into segments for scoring. The scoring for each segment was done on the basis of the infrastructure available and its comparison with the existing standards. The scoring for each “assessment parameter” was done in two parts—designs according to the standards, and the existing situation in a given segment.

The final score of each component was multiplied with the segment length. The score of the component was derived by adding the scores of all the segments and then dividing it with the total length. This process gave the score for each component of the corridor with respect to safety and accessibility of cyclists and pedestrians. The scores were assigned to quantify the problems and indicate the variability on a scale. The review of the corridors was based on the auditing.

This was supplemented by a perception survey to assess how pedestrians, cyclists and public transport users feel about the walking conditions and overall environmental conditions. CSE also took into account user perceptions on personal safety and availability and quality of infrastructure to evaluate ranking of each component and rating of the corridors.

**The ranking for all the parameters for the roads influencing the chaos in and around the Alaknanda market:** The ranking clearly shows that none of the parameters stand anywhere close to average on any of the roads. The ranking of all the road segments show that for all parameters, all roads scored from “very poor” to “poor”. None of the corridors featured in the “average”, “good”, or “best” classes. For the criteria on footpaths, some roads hit the second lowest rank of “poor”. This brings out how dismal the state of affairs is (see Figure 8: Average ranking for influence area along the Alaknanda market).

**Figure 8: Average ranking for influence area along the Alaknanda market**



Source: CSE



Source: CSE

## Footpaths and cycle tracks

- Footpaths are available for around 70 per cent of the total length surveyed, but the stretch has no extensive cycle track.
- The width of a footpath (according to the *Street Design Guidelines*) should be a minimum of 1.8 m, only 20-25 per cent of the total road stretch surveyed meets this norm.
- The kerb height (norm is 150 mm) is unacceptable along all the roads, only the road near the St. George School has a kerb height meeting the standards.
- The area along the market does not have a continuous footpath.
- Footpaths width varies from 1.5-2 m and is very close to the permissible width mentioned in the standards only along the area of the residential colonies; the width of the footpath near the market is 1.5 m, it should be 2 m according to the standard.
- The footpaths outside the market and along the Alaknanda road have been barricaded by railings, which makes them inaccessible to people.
- At many places hawkers have encroached on the footpaths, leaving no walking space for pedestrians.
- In most areas tree branches lean low on the footpaths, making them difficult to access.



Source: CSE

## **Crossing facilities**

Little thought seems to have been given in the road design to safe crossings for pedestrians and cyclists.

- The stretches audited score very poor on this parameter.
- For crossing, only one element is provided on the road and that is zebra crossing, which is visible only at 10-15% of all the crossings.
- None of the intersections or junctions are provided with raised table-top crossings or pelican signals for convenient crossing.
- There is no provision of mid-section crossings at any point even when the land use is mainly residential and mixed.
- Even at junctions and transit stops there is no provision of safe crossing for pedestrians. They have to jump the median to go to the other side.
- The Alaknanda road is a local road with no medians and no safe crossing mechanism making it more dangerous for old people and kids to cross.



Source: CSE

## Environmental conditions

- All the stretches along the market score very poor on this count.
- The footpaths are unhygienic with no public toilets and no seating areas along any of them.
- The footpaths do not even have concentrated lighting, making them unsafe in the evenings and during the night.
- No amenities are provided along the bus stops and footpaths nor are any spots earmarked for hawkers.
- There is no provision for shaded footpaths even when facing seven months of harsh summer.
- Footpaths all along the segments hug the boundary walls, making them unsafe and vulnerable to crime.
- Parking on footpaths is a menace, especially along Guru Ravidas Marg and on Shaheed Surya Sen Marg.
- Aesthetics are unappealing. Many stretches of the footpath are broken and in insanitary conditions. Construction debris occupies their space. A garbage dump spills over them along Shaheed Surya Sen Marg.

## Transit stops and universal accessibility

- Accessibility to public transport nodes is poor in almost all the corridors.
- Bus stops are located on footpaths, as there is no clear multi-function zone.
- The height of the base of the bus stop does not match with the base of the bus.
- According to the UTTIPEC guidelines, the bus stops should be equipped with amenities such as public toilets, seating areas, kiosks, route maps and have adequate lighting, but all the transit stops score very poor in these aspects. The amenities are negligible; even the size of the bus box is inadequate to accommodate the people using the bus services.
- The infrastructure in all the corridors is not designed keeping the disabled in mind, in fact, all the corridors score “0” in this aspect.
- None of the road stretches in the given corridors have footpaths with adequate height and there is no provision of ramps.
- There are no auditory signals at any of the intersections.
- The tactile paving provided on the footpaths have no relevance as they begin in the middle of the footpath and end abruptly anywhere.
- No provision of ramps has been provided on bus stops for physically challenged and visually impaired.
- At two or three bus stops the ramps are provided but they are obstructed by billboards.



Source: CSE



## HIGHLIGHT OF THE STUDY ON ALAKNANDA ROAD FROM YAMUNA APARTMENTS TO SAVITRI CINEMA IN GK-2 BY RANJIT SABIKHI ARCHITECTS

The local area crises have encouraged the joint forum of resident welfare associations in Alaknanda and GK-2 to join hands to garner technical support to assess the problem and find solutions. This is an important forward step for participatory local area planning.

A study called *Road Condition Analysis in Greater Kailash 2* has been carried out by Ranjit Sabikhi Architects on the stretch beyond the CSE study area on Alaknanda road. This is a voluntary effort in which the noted architect, also a resident of the area, has come forward to extend support to community initiatives. This stretch extends from Yamuna Apartments to the corner of W Block, GK-2 and along the GK-2 Enclave Market to Savitri Cinema on Outer Ring Road. The report has specifically looked at the implications of the PWD's median verge along the entire length without providing proper openings for the turning of traffic or locating required pedestrian crossings, which is in violation of the notified UTTIPEC guidelines.

The study has identified the following problems:

**Inadequate and unsafe pedestrian crossings and inappropriate central verge:** This being a residential area, there is considerable pedestrian movement for which adequate provisions need to be made. The new median created by the PWD has very few pedestrian crossings and the distance between the crossings is very long and not consistent with the UTTIPEC *Street Design Guidelines*. According to the guidelines pedestrian crossings have to be provided at every 80-100 m. But the current spacing is much more than that. Median height is 500 mm with no crossings, making crossings unsafe.

**Encroached footpaths:** Alaknanda road is 24 m wide, with 4.5 ft wide pavements on either side, extensively encroached upon the entire length by parked cars and unauthorised food kiosks and

carts. Major obstructions on pedestrian footpaths and on traffic roads are caused by parked cars around GK-2 Enclave shopping centre.

**Poor parking provisions:** No proper provision have been made for parked cars in the DDA shopping centre. This has resulted in extensive double parking along the sides of the roads, causing major obstruction to traffic movement. Although the Savitri Cinema Road is a 100 ft wide road, due to encroachment by parked cars and the median, traffic in front of the Kohinoor Mall as well as in front of banks, restaurants and shops is funnelled into a single lane. This needs urgent correction.

**Badly planned road junctions:** Junctions on the roads leading to the Central Market, GK Enclave II and GK III (Masjid Moth) are badly planned. Traffic lights installed here are unable to control haphazard traffic. There is enough space to consider reorganising of the road layout at this location to provide a neat right angle crossing with traffic lights. This would considerably ease the traffic movement in the entire surrounding area. The study has asked for raised crossings to align the road height with the footpath height. This makes vehicles to slow down and also increases visibility of pedestrians. Such raised crossings are needed at slip roads, where high volume streets intersect with low volume streets, and at mid-block crossings.

**Other obstruction on footpaths:** Extensive encroachments on footpaths in the form of ad hoc food-vending structures and informal retail. Not only do these constitute major obstructions to pedestrian movement, but are also a source of nuisance due to improper disposal of garbage, used paper plates, leftover food, etc., leading to obnoxious smell in the surrounding areas. Similarly, car parking across footpaths forces pedestrians to walk on the road, resulting in their undesirable mix with vehicular traffic.

## CHITTARANJAN PARK: CONGESTION NIGHTMARE

Adjacent to Alaknanda and GK-2 is yet another prominent colony known as Chittaranjan Park (C.R. Park). This area of about 90 hectares has been developed as residential plots which are very different from apartment blocks in the Alaknanda area. There are about 2,410 plots. Initially single storey buildings were the norm. In subsequent years, they have been rebuilt as multi-storey buildings bringing more families into the same plot area. Moreover, with time a great number of the buildings lining the main thoroughfare—Bipin Chandra Pal Road—have become mixed-use combining both residential and commercial components.

Bipin Chandra Pal Road has a right of way of 18 m. The entry from this road to different blocks is served by 12 m-wide streets. The inner streets within the blocks are 6-8 m wide. This entire network of streets is under tremendous traffic and parking pressure. Bipin Chandra Pal Road now serves as a sub-arterial road to funnel enormous through-traffic from its catchment as well as what it generates on its own.

This is further compounded by enormous parking pressure from the ever-increasing number of cars owned by residents of the area. About 2,410 plots of varying sizes in the colony now hold as many as 7,230 dwelling units—three times the number of plots. This has induced enormous and multiple car ownership.

The demand for parking from the current fleet in the area is already equivalent to nearly 28 per cent of its geographical area. This has taken over all available on-street space. If the Delhi Master Plan norms for residential parking are applied to the built up floor area of this colony then a maximum of 5,868 legal parking slots should have already been provided for within the plotted development. But these norms were not enforced and therefore a very small share of parking has been created inside the residential plots. This has led to spillover of parking on roads and streets. The current parking demand is much higher than what could have been legally provided. The current demand is as high as 10,845. Free parking in the residential area is inciting uncontrolled motorisation. There is no off-road shared and priced parking lot.

This only foreshadows the future crisis. Assuming that the entire C.R. Park gets rebuilt with the maximum floor area ratio of three per plot permissible under the Delhi Master Plan 2021 for areas outside transit-oriented development and with plots less than one hectare then, as per the legal parking norms of the

Master Plan, a parking stress of 26,640 slots will be added. This is a staggering 75 per cent of the total area of C.R. Park. Given the fact that most buildings do not have basement or stilt parking and even where they have them they are barely used during the day because of the inconvenience of frequent entry and exit, the entire road network in the neighbourhood will be fully choked.

The colony has already hit the tipping point. Night time surveys have shown choc-a-bloc streets that can make entry of emergency vehicles like ambulance and fire brigade very difficult. Even personal entry and exit is challenging. There has to be community recognition of the limits to car usage in the area and support action to reduce this.

The estimated area of playgrounds and parks in the colony is around 36 acre, i.e., 17 per cent of the total area. Some residents have now begun to ask for car parking structures in the designated play grounds. This is not legally permitted under Delhi Master Plan and should not be allowed. Protection of parks and play grounds is critical for the overall health of the residents. Studies have shown shrinking green areas in neighbourhoods increase obesity index especially childhood obesity and diabetes. This calls for a community initiative to demand and support strategies to reduce dependence on cars.

### What can C.R. Park do?

**Organise and limit legal parking:** Create parking management plans for the entire area to identify areas where parking can be allowed or banned and organise the parking. According to the *UTTIPEC Street Design Guidelines*, parking cannot be allowed on streets with a 12 m right of way and less. Given the parking pressure in the area, steps should be taken to earmark parking on the main collector road. Survey shows that setting aside entrance points, provisions for on-street single-line parking can be made for 25 per cent of on this 2 km road stretch. Similar areas can be demarcated even on 12 m wide stretches. But smaller lanes cannot take any more parking pressure. In fact, according to the Delhi Master Plan of 2021 the streets with a 6-8 m right of way should be made “pedestrian only streets”.

**Introduce residential priced parking permit for use of public space for parking:** This colony has



saturated all its available space for parking. The colony will become unliveable if parking pressure continues to increase unabated. The colony does not have unused open spaces that can be built as parking space; at best some public areas in front of markets and schools can be developed for shared night time parking. This will have little impact as the total parking pressure is already very high. Only pricing can help to lower the parking demand to bring it close to what is permitted legally and that can serve all households. Parking pricing should be able to discourage uncontrolled multiple car ownership.

It is important to draw lessons from other cities. Kolkata, for instance, has enforced parking policy for streets with a width of less than 18 m. Night time parking is banned at many places. In some areas, personal vehicles pay night charges for on-street parking in narrow neighbourhood streets. Those who cannot park on roads rent spaces to park cars. They pay in the range of about Rs 1,200-1,500 per month. This is similar to the Tokyo model. In Gangtok, Shimla, Aizawl and cities of Rajasthan, car purchase is not allowed without proof of a legal parking area. Delhi needs similar strategies.

**Need efficient connectivity with transit lines all around the colony to reduce car dependency:** The CSE survey has shown clearly that this colony is most advantageous in terms of its proximity to the public transport nodes. After the completion of the phase III Metro line on Outer Ring Road it will be served by several important metro stations and terminals located at Nehru Place, Govindpuri and on the Outer Ring Road—all located within a 500 to 800/1,200 m radius. This is consistent with the Transit Oriented Development Policy that Delhi is adopting and also the same policy principles that have been integrated with the Smart City Policy of the Central government. The key roads in and around the colony—Bipin Chandra Pal Road, Hans Raj Sethi Marg, that divides C.R.

Park from Kalkaji, and Uday Shankar Marg, that cuts through GK-2, need to be integrated through efficient feeder service with the surrounding metro stations.

It is also important to revive the popular bus routes that served Bipin Chandra Pal Road. One of the shocking revelation of the survey has been the drastic curtailment of bus services to the area. This area was well served by several bus route numbers including 490, 411, 412, 444, 424, 426, 541, mini buses, and 432. Now, except 490 nearly all buses have been curtailed, creating serious deficit in the bus service. This means the student community and young professionals have no access to public transport. The bus stations will have to be developed as multi-purpose zones with provisions for intermediate public transport as well.

**Map the area for pedestrianisation:** Several parts of the colony can be pedestrianised. With improved and safe pedestrian infrastructure, traffic calming, improved feeder to public transport, a large number of short motorised trips can be reduced. In fact, the current practice of blocking the smaller lanes with gates on several points that do not allow vehicle entry and exit has pedestrianised several streets by default. Interestingly, C.R. Park is the only colony in the city that has demonstrated how a vibrant community space can be created during four days of Durga Puja festival every year.

This area needs a combined strategy of parking restraint and pricing, improved feeder connectivity with metro stations, intermediate and bus service, and planned pedestrianisation with redesigned streets.



Source: Based on Google Earth and Eicher map

# The way forward: Redesign the road and restrain traffic

The congestion and pollution crisis in the Alaknanda area has already reached a tipping point. If business as usual continues, then the crisis will only worsen, rendering the area unliveable. The current solution of building a central verge is only focussed on the through-traffic and does not address issues related to local access and safety and the need for converting short distance car traffic to non-motorised and pedestrian trips, cutting congestion and pollution. Making cosmetic and partial changes will not help. The entire road will have to be redeveloped according to the *Street Design Guidelines* with improved access. The concerned agencies including PWD, MCD South, Traffic Police and DDA will have to implement concept plans to address all road users.

A proper solution to the local crisis will need action at the local as well as city level. At the local level, there is a considerable scope for changing the design of the road and reorganising all street activities to cut the clutter and the chaos. Simultaneously, a larger regional and zonal level action is needed on public transport connectivity, traffic dispersal, and restraint measures like parking policy and taxation to reduce the overall volume.

CSE has piloted a detailed design for the targeted 800 m stretch on this road to demonstrate that change is possible. The aim is to change the design of the road and reorganise street activities for less congestion and improved walkability for zero accidents and reduced motorised trips for short distances. For this purpose, the 800 m stretch from the crossing of Alaknanda road and Guru Ravidas Marg to St. George School crossing has been considered. The right of way of this street is about 24 m.

The drawing (*see figure 9: The existing activities along Alaknanda road*) depicts the current chaos and ill-planned design.

## **What can be done?**

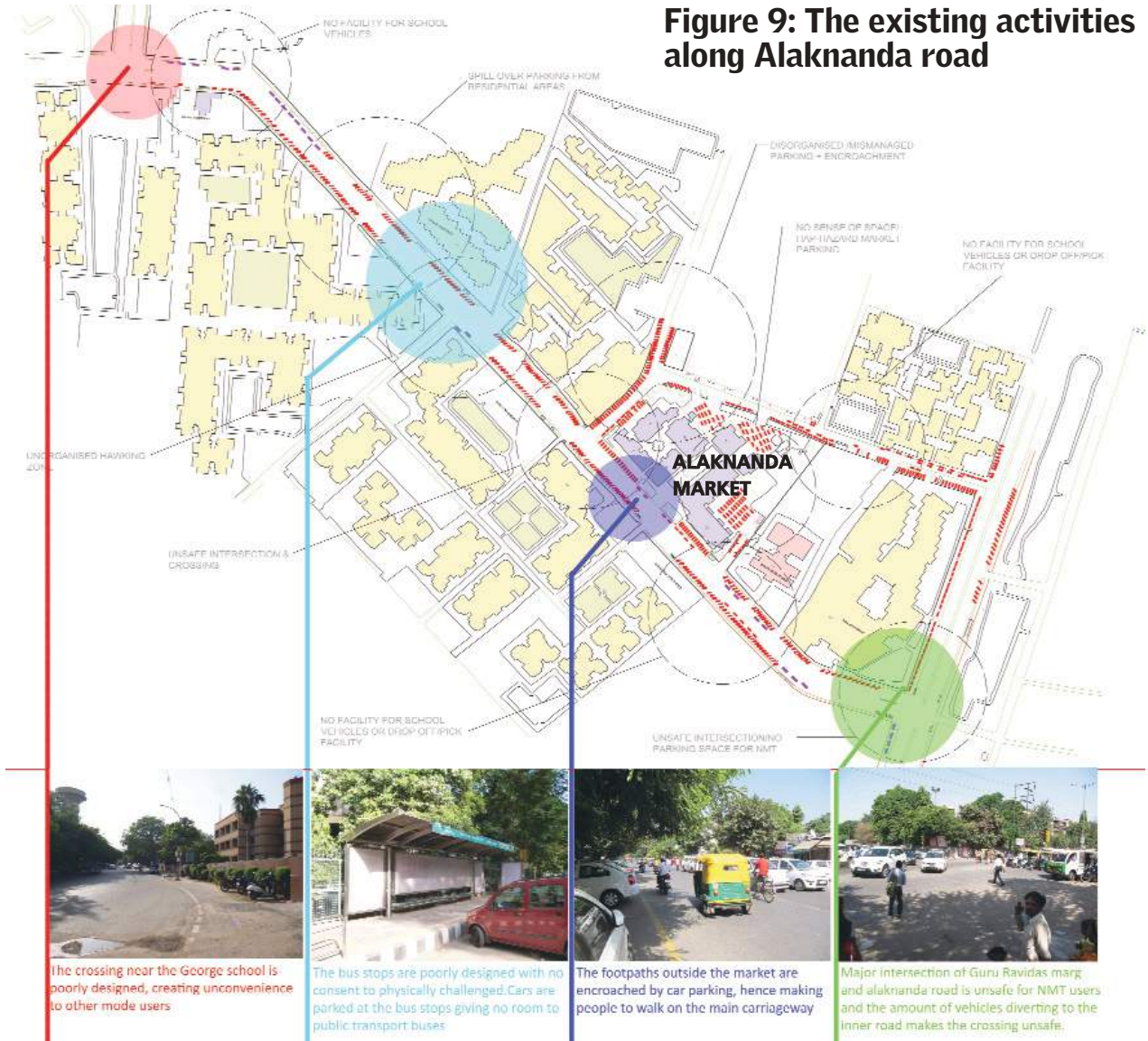
While designing the concept plan for the area, key guiding principles of the current policies have been considered. These include National Urban Transport Policy and National Habitat Standards.

The objectives of the National Mission for Sustainable Habitat, the National Urban Transport Policy as well as the revised Parking Policy of the Master Plan of Delhi (MPD) 2021, have informed the proposed design concept of CSE. The key guiding principles are as follow:

- Plan for people not vehicles. Improve ambient air quality, reduce exposure to

**The current solution of building a central verge is only focussed on the through-traffic and does not address issues related to local access and safety**

**Figure 9: The existing activities along Alaknanda road**



Source: CSE

harmful pollutants and secure public health. Reduce rates of vehicle/km travelled and energy consumption.

- Increase access and sustainable mobility choices.
- Increase public safety. Improve equity in growth.
- Private vehicles must be parked on “a fully-paid rented or owned” space, based on the “user pays” principle.
- Parking management must be effectively used as a tool to reduce overall demand for parking space.
- Pricing and enforcement will be key drivers to eliminate or reduce long-term on-street parking demand for private vehicles.
- Planning and design of public parking facilities in an area need to provide for all modes and include creation of pedestrianised areas/public spaces in the area with necessary amenities.
- Parking spaces will be adequately provided on priority basis for intermediate para-

transit (IPT), pick and ride and feeder systems especially non-motorised and fully subsidised transport.

- Increase public transport and non-motorised transport usage.
- Preservation of green and open space.

Delhi Master Plan has further set the target of meeting 80 per cent modal split of public transport ridership by 2021.

**Implement street design guidelines of UTTIPEC:** The new conceptual design takes into account the key elements of UTTIPEC *Street Design Guidelines*, which is the guiding legal document for road infrastructure in the city. These guidelines have already been notified in July 2015 under the Delhi Development Act and mandated in the Delhi Master Plan to make their compliance a legal requirement. The new conceptual design follows some fundamental principles. It has segregated space for road users as much as possible, reorganised street activities, provided more safe crossing facilities at grade, removed encroachments, provided space for key services of para-transit, provided legal parking, vendors, bus stops, etc, and freed up spaces to improve street scaping and to create plazas and improved overall environmental conditions (see Figure 10: Proposed plan for Alaknanda road with all the design elements). For segment-wise design details see Annexures.

**EXISTING**



**PROPOSED**



Source: CSE

**Figure 10: Proposed plan for Alaknanda road with all the design elements**



Source: CSE

### Key highlights of the proposed design

**Reorganising the street does not compromise carriageway but improves footpaths, crossings and multi-function zones:** Simple steps can help to cut the clutter and chaos. It has been demonstrated that even without disturbing the current width of the carriageway, which is 14 m wide, it is possible to have a minimum of 2.5-5 m wide footpath with a multi-utility zone. The current width of footpath is 2 m. By removing on-street parking from a few stretches, the carriageway can be freed up for traffic. The carriageway has not been changed, but the rest of the space has been reorganised to accommodate maximum features. The width of the footpaths has been kept between 3-5 m with a height 150 mm for most of the corridor. A cycle track could not be provided in the stretch so the footpath has been aligned with a multi-functional zone.



Source: CSE

All crossings will be signalised and synchronised to make pedestrian crossing safe. All railings along the footpath should be removed. The footpaths should be cleared of all impediments. Vendors should be relocated to select points as per the plan. All essential infrastructures such as bus stops, IPT parking, street trees and vending zones are to be located within a multi-utility-zone (MUZ) that abuts the footpaths to ensure ease of access as well as safety.

In addition, it is also important to reorganise the street behind the Alaknanda market along the DDA flats and close to J.J. colony. This is a narrow 16 m wide road. It is possible to maintain the current width of the carriageway, which is 6.5 m wide, alongwith 2 m wide footpath.

**Proper signages and lighting have been provided for the cycle tracks and footpaths. The height has been maintained at 150 mm to make it safe and convenient for people**

**Pedestrian/NMT priority:** As envisioned in the *UTTIPEC Street Design Guidelines*, pedestrians and NMT are given a priority. All streets include a minimum 2.5 m continuous footpath increasing up to 5 m in locations with greater footfalls and where space permits. In conjunction, signalised raised table crossings are provided at junctions as well as mid-block locations so that users have the opportunity to cross safely every 80-100 m. All essential infrastructures such as bus stops, IPT parking, street trees and vending zones are located within a multi-utility-zone (MUZ) that abuts the footpaths to ensure ease of access as well as safety. Segregated NMT tracks are proposed along Guru Ravi Das Marg (30 m right of way). These are clubbed with a detailed junction design to allow for safe cross-over to Alaknanda road which has a 24 m right of way and does not require separate NMT tracks.

In the new scheme of things, proper signages and lighting have been provided for the cycle tracks and footpaths. The height has been maintained at 150 mm to make it safe and convenient for people. Special consideration has been given to safe crossings for pedestrians, by providing a mid-block table top and crossings after every 100 m. The intersections have been designed keeping walkers and cyclists in mind, and refuge islands have been provided. The bus stops have been retained, though they can be better equipped with more seating spaces and public utilities for both men and women.

**Public transport and IPT:** Access to public transport nodes and facilities has been made direct, convenient and safe. Pedestrian crossings are provided close to bus stops which

have also been designed with designated bus boxes. Parking areas for IPT have been given priority, locating these within the MUZ, close to junctions and activity hot-spots such as the market front. Two auto-rickshaw stands are located in front of the market, two others near the junction of Alaknanda road and Guru Ravi Das Marg and two near St. George's School. As a response to the extensive use of Grameen Seva services, designated bays for stopping have been provided within the MUZ close to the bus stops along Guru Ravi Das Marg.

**Vehicular movement:** A clear two-way carriageway of 14 m is proposed along Alaknanda Road and that of 15 m along Guru Ravi Das Marg to allow for the smooth flow of vehicular traffic. It is proposed that all crossings are signalised and also synchronised to allow regulated vehicular flows while aiding safe crossing facilities for pedestrians.

All parking for private vehicles within the public realm is on a pay-and-use basis. In order to maximise parking turn-over and, therefore, parking capacity, short-term paid parking has been prioritised to facilitate visitors and shoppers. Two dedicated locations for high capacity stack parking are proposed within Alaknanda market to address the needs of shop-owners and workers.

**Private vehicle parking:** The concept of on-street parking management of Alaknanda market and surrounding areas is defined by the larger aim of reclaiming public space from under private vehicles to provide safe, comfortable and convenient streets for all modes and deliver a delightful place. Our proposal attempts to provide comprehensive facilities for all modes including private vehicles in a well planned manner, located as per the needs and convenience and functionally integrated with the location and provision of all essential street activities.

An activity survey conducted for the area in August 2014 revealed that the current parking stock was as high as 630 with approximately 40 per cent located around the market.

The proposal allows for 176 spaces for short term parking within the MUZ of right of ways and 78 spaces for long term off-street parking planned as stack-parking within the market area. All parking for private vehicles within public land is on a pay-and-use basis. In order to maximise parking turn-over and, therefore, parking capacity, short-term paid parking has been prioritised to facilitate visitors and shoppers. Parking provision for school buses, as mentioned above, doubles up as short-term paid parking during all non-school timings. Two dedicated locations for shared unbundled high-capacity priced stack parking are proposed within Alaknanda market to address the needs of shop-owners and workers. To incentivise the use of these off-street facilities for long-term parking, exponentially higher rates could be charged for on-street parking beyond one (or two) hours.

While parking provision in the proposal is at approximately 40% per cent of the existing stock, it can be assumed fairly confidently that through an effective pricing and management strategy and segregation of long-term and short-term parking as proposed, the turnover could be increased substantially, thereby increasing the parking capacity of the precinct. Assuming that two hours is the maximum period that one parks for in the short-term parking areas, through a 10 hour day (from 9 a.m. to 8

**Access to public transport nodes and facilities has been made direct, convenient and safe**

p.m.—the market draws crowds up to late in the evening) five cars can be parked in each bay, giving a minimum total capacity of 880 cars in addition to the 78 spaces designated for long-term parking, 150 per cent of the current stock.

**Build public support for the new parking strategy:** It may be noted that this concept of parking is governed by the principles of the National Urban Transport Policy stating that private vehicles must be parked on “a fully-paid rented or owned” space, based on the “user pays” principle. Parking management must be effectively used as a tool to reduce overall demand for parking space. Pricing and enforcement will be key drivers to eliminate or reduce long-term on-street parking demand for private vehicles. Planning and design of public parking facilities in an area need to provide for all modes and include creation of pedestrianised areas/public spaces in the area with necessary amenities. Parking spaces will be adequately provided on priority basis for IPT, pick and ride and feeder systems. The Supreme Court has also taken on board that, “Land is limited and there is a limit to the additional parking space that can be created in the city. This will require a well thought out pricing policy to control the demand for parking.”

Building public support for this parking plan is critical to address the crisis. Public support can be stronger if people understand the benefits of parking management. Reliable and predictable information about parking availability reduces cruising time, fuel cost and pollution. Efficient billing makes payment more transparent and accurate. This will decrease traffic chaos due to indiscriminate on-street parking.

Both car and non-car users will benefit as this will protect footpaths and allow barrier free walking; this will free up public spaces for walking, auto-rickshaw-parking, play grounds etc. This will also improve access to bus-stops, metro stations; safety of children, women and elderly people; visibility of shops, shopping experience and throughput of customers; the overall environment, green areas and public recreational spaces. This will make it easier for emergency vehicles like ambulances, fire trucks, police, etc. to transit quickly in an out of the area. Improved walkability can cut down short vehicular traffic.

Even urban local bodies will benefit as more revenue can be generated for local area development, chiefly transportation projects.

**School bus parking:** As noted earlier, lack of parking for buses and mini-buses for both St. George’s School and New Green Fields School coupled with bad management has led to severe issues of congestion and safety. Therefore, designated parking spaces for buses are proposed adjacent to the schools. These are planned as priority parking for school buses with time restrictions (one hour slots in the morning and afternoon as per school timings) such that during all other times, the parking spaces may be used as short-term paid parking.

**Hawkers’ zone:** Hawkers have been placed near the bus stops or near the openings of the residential colonies on the multi-functional zone. Proper grade crossings have been provided outside the schools for safe crossing of kids. Parking has been restricted only along the market area and close to the schools. All the parking provided along the stretch is mainly on-street priced parking accommodated in the multi-functional zone. Near the schools parking has been provided mainly for 4-5 buses and few hop-on and hop-off spots for cars where parents can drop and pick up the kids.

**Private vehicles must be parked on “a fully-paid rented or owned” space, based on the “user pays” principle**



**EXISTING**

Source: CSE

**PROPOSED****Recreating a special place—Alaknanda market**

Alaknanda market itself is seen as a retail hub situated within a seamless, beautifully designed public realm that allows free pedestrian movement and the unfolding of various activities that bestow vibrancy to a place. The reorganisation of space will also allow the creation of well-designed 6 m wide pedestrian plaza in front of the market. As a direct response, the “plinth” of the market has been extended to the edges of the surrounding streets, creating a series of inter-connected piazzas with varying character. While this reclaims valuable public land from under the cars (a large portion of the rear of the market area is currently under car parking) to enable the creation of the plazas, it also reduces parking supply. In response, short-term paid parking is planned along these edges. This is designed in a manner which minimises haphazard parking and allows for visual screening by trees. However, a substantial length of the market front abutting Alaknanda road is kept free of parking to accentuate the impact of the central piazza and raised table crossings in front of Alaknanda Apartments as well as the junction with DDA Flats Road, aiding cross-movement. As mentioned above, two locations of high capacity stack parking are proposed within the market.

The character of the market to the rear, along the DDA Flats road, changes in response to the immediacy of the residential frontage it abuts. A shared street with no vertical segregation, it signals pedestrian priority and low speeds. The proposal envisages a vibrant mixed-use development along the ground floor of the residential edge, a condition that is already beginning to emerge.

Attractive place making in the market area can increase footfalls and the volume of business as demonstrated by similar experiments in other countries.

**Alaknanda market is seen as a retail hub situated within a seamless, beautifully designed public realm**

# Action plan for implementation of the concept plan

## Stakeholder consultations and community participation

It is proposed that stakeholder meetings with government agencies, residents' groups, market association etc. be organised to present the existing scenario and proposed solution for the benefit of all concerned user groups. Agreement on the proposal by all stakeholders will be obtained for temporary demarcation of designated spaces and a trial run program for one-three months to be monitored by a team comprising representatives of the government agencies and community representatives for testing on ground.

### Temporary demarcation of designated spaces—PWD

- Carriageway line on both sides leaving clear 14 m space for two way movement of traffic.
- On-street car parking sites at designated places with clear parking slots marked on the road.
- Extended footpath space as per street design with temporary bollards.
- Zebra crossing marks on mid-sections and intersection points as per the plan.
- Signage on all points—pedestrian crossings, parking, auto-stand, bus parking with timing.
- Median markers to regulate directional traffic.
- Removal of all railings from the footpath.
- Clearing all impediments from the footpath.
- Relocation of vendors to selected points as per the plan.

### Trial run program by road and traffic agencies

A trial run program will be initiated by a joint group after demarcating spaces for various functions and activities as per the street design. This will be supported by a traffic management plan for testing the benefits based on user feedback and general observation on improvement on all aspects. All demarcated parking sites are to be managed so as to not overspill and impede the traffic movement.

### Approval and ownership of the project

The conceptual street design adopted for the trial run will be modified, if necessary, based on feedback from the monitoring team and then finalised. The final tested conceptual plan/design will be detailed out by the road agency as a single project for civil works on retrofitting of roads and installation of all new street components. Necessary administrative and financial approval will be taken in a time-bound manner. Agencies will take the ownership of the project beyond civil construction and this will be extended to the overall management of the system as a model for all such participatory street projects.

### **Implementation program of road agencies**

A detailed implementation plan showing all components and estimated cost with timelines etc. will be shared with the community and uploaded on the website. The implementation program with phasing of construction and traffic management will be worked out in consultation with all stakeholders and shared with the community/public in advance. All street components including traffic control components like signals, signage, markings etc are to be installed /implemented as per the street design by PWD and traffic police .

### **Traffic Management Plan (TMP)**

- Visible and functional traffic signals with timers.
- Visible and functional pedestrian signals at intersections with timers.
- Visible and functional pedestrian signal at mid-section with fixed time interval or blinkers for vehicles to slowdown /stop for pedestrian to cross.
- Synchronisation of signals.

### **Parking Management Plan (PMP)**

Parking sites earmarked as “on-street—short-term” and ‘off-street—long-term” to be managed by one agency within the parking pricing based on demand with a supply cap for the influence zone. The strategy is to increase parking turnover with hourly high pricing for more than one hour in a progressive manner to discourage long-term occupation of parking and freeing on street parking space for more number of customers. Off-street parking within the designated market parking space for long-term parking with monthly/daily pass with lower pricing would provide adequate parking space for shopkeepers. The collection of parking fee should be only by parking meters/handheld machines under strict supervision of a monitoring committee to avoid pilferage and collection of more revenue. A separate model for engaging parking management and revenue model needs to be worked out for efficiency and control.

### **Enforcement**

Traffic police to declare a “no tolerance zone” for illegal parking on any public place in the project area not designated as parking and penalise for illegal parking and remove any impediments from the road. MCD South to remove any illegal activities and unauthorised occupation of public spaces including roads and footpaths.

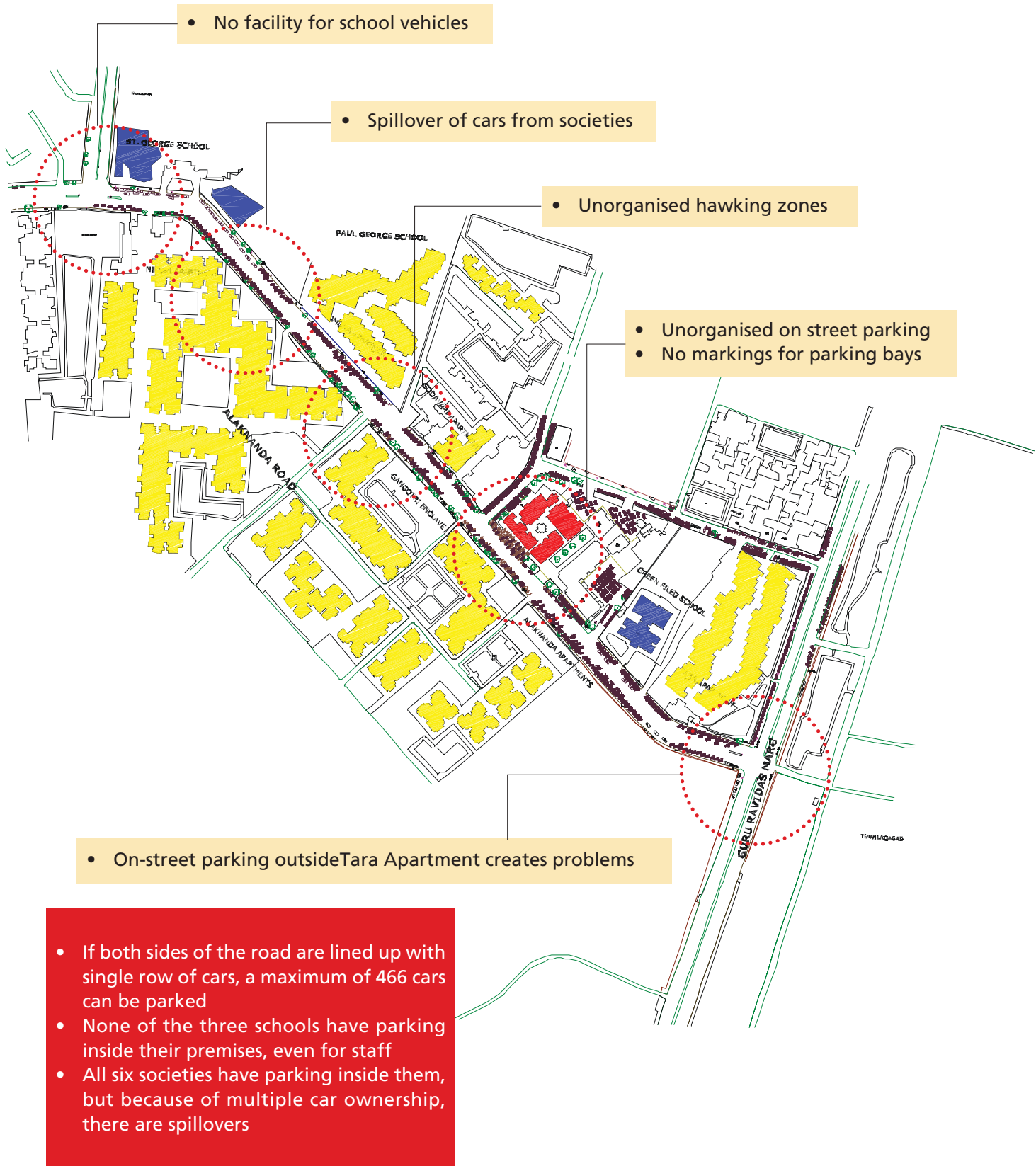
### **City-wide action plan**

Simultaneously, prepare and implement a city action plan for integrated public transport system, improved last mile connectivity by providing efficient and affordable feeder system and parking and taxation policy as a traffic restraint measure.

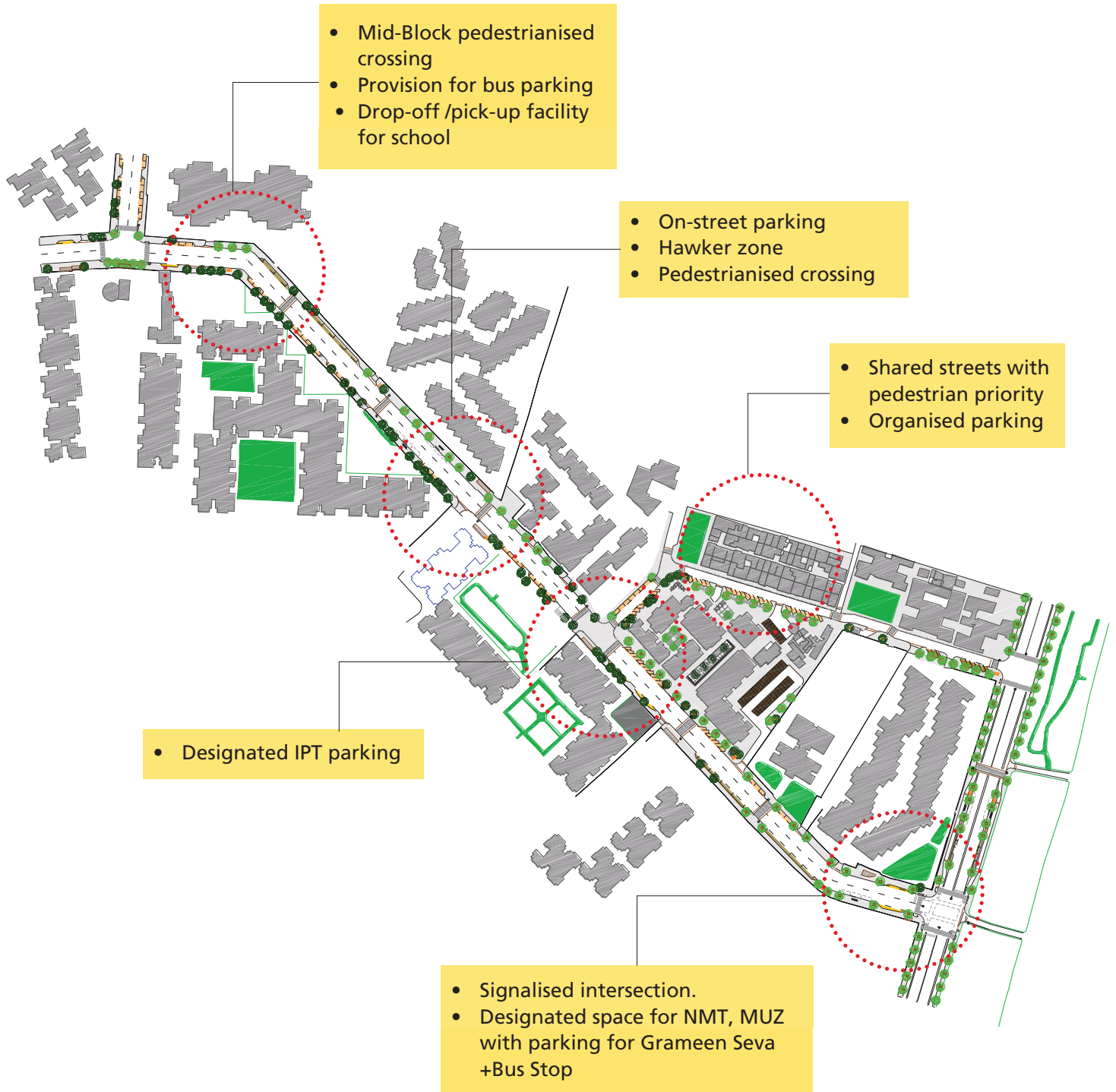
## **REFERENCES**

- UTTIPEC 2009, *Street Design Guidelines*; Revision 1, 2010, Delhi Development Authority
- RITES 2010, *Transport Demand Forecast Study and Development of an Integrated Road Cum Multi-modal Public Transport Network for NCT of Delhi*
- IIT Bombay 2014, *Transportation System Engineering*
- L R Kadiyali 2012, *Traffic Engineering Transport Planning*, VIIth Edition
- Delhi Development Authority, *Master Plan of Delhi, 2021*

## Annexure 1: Plan showing existing condition of Alaknanda road

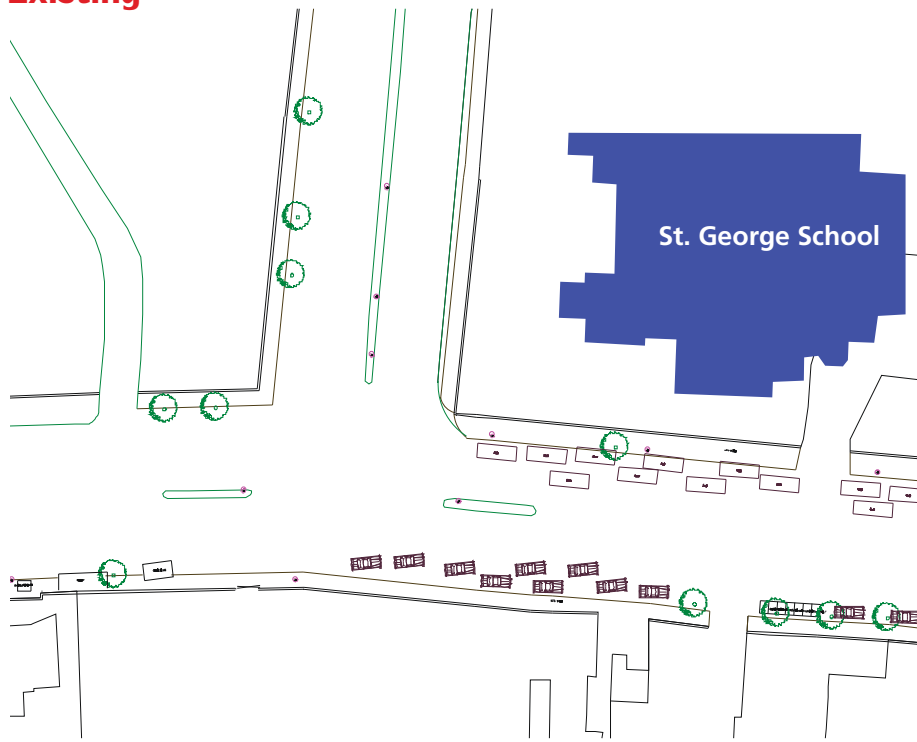


## Annexure 2: Plan showing proposed street design for Alaknanda road



## Annexure 3: Plan showing existing condition and proposal for St. George School intersection

### Existing



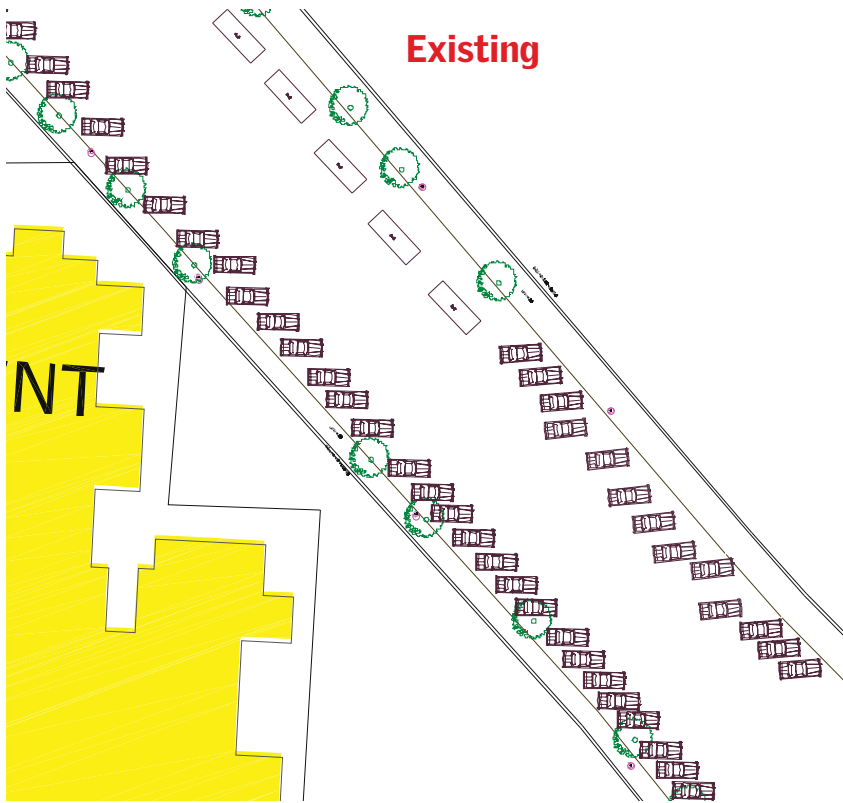
- No facility for school vehicles
- Spillover of cars from residential societies
- Unsafe crossings

### Proposed



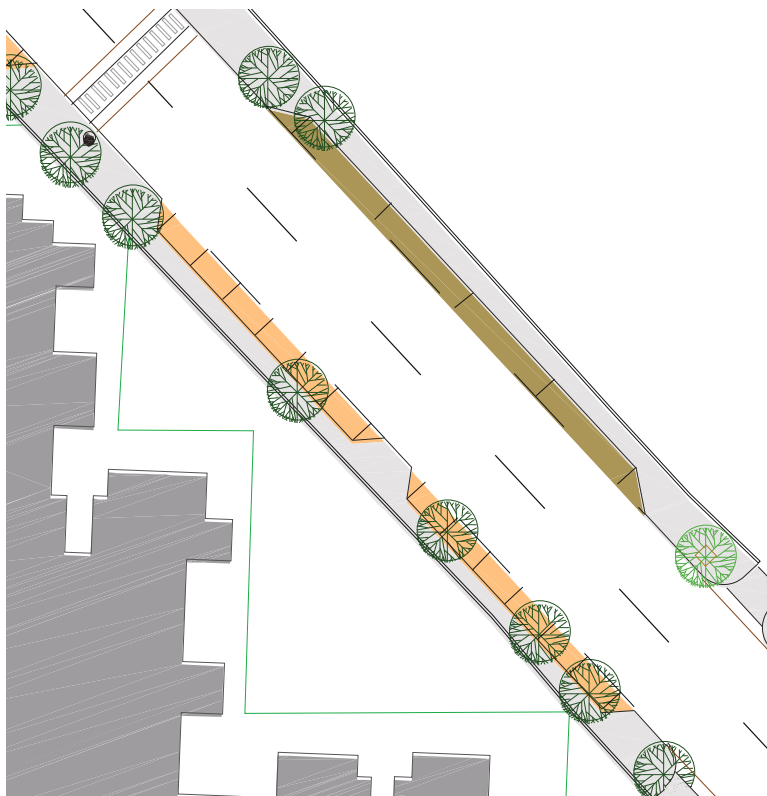
- Mid-block pedestrian crossing (signalised).
- Provision for school bus parking (time bound)

## Annexure 4: Plan showing existing condition and proposal for road opposite Paul George School



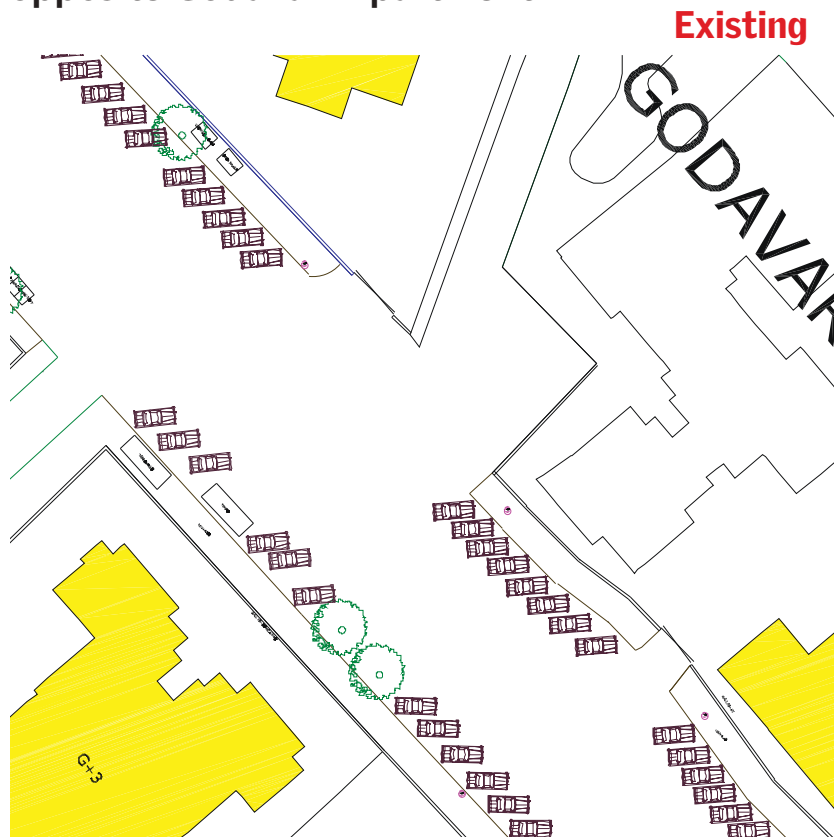
- No space for school bus parking outside the school
- Spillover of cars from the societies
- Safe crossings

### Proposed



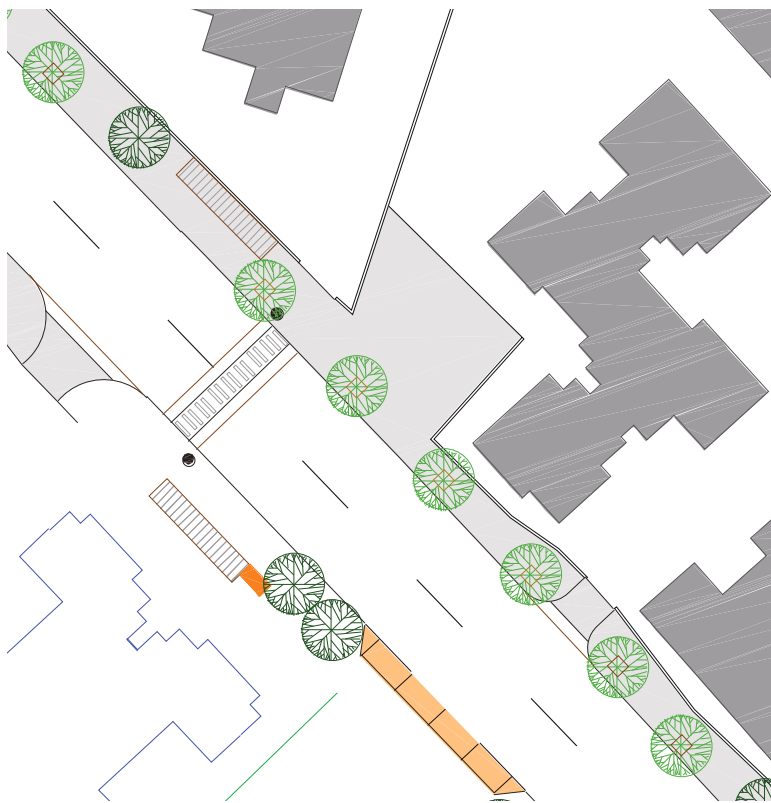
- Drop-off /pick-up facility for school (short term paid car parking)
- Space for on-street parking

## Annexure 5: Plan showing existing condition and proposal for road opposite Godavari Apartment



- Unorganised hawking zone
- Spillover of cars from the society
- No pedestrian crossing

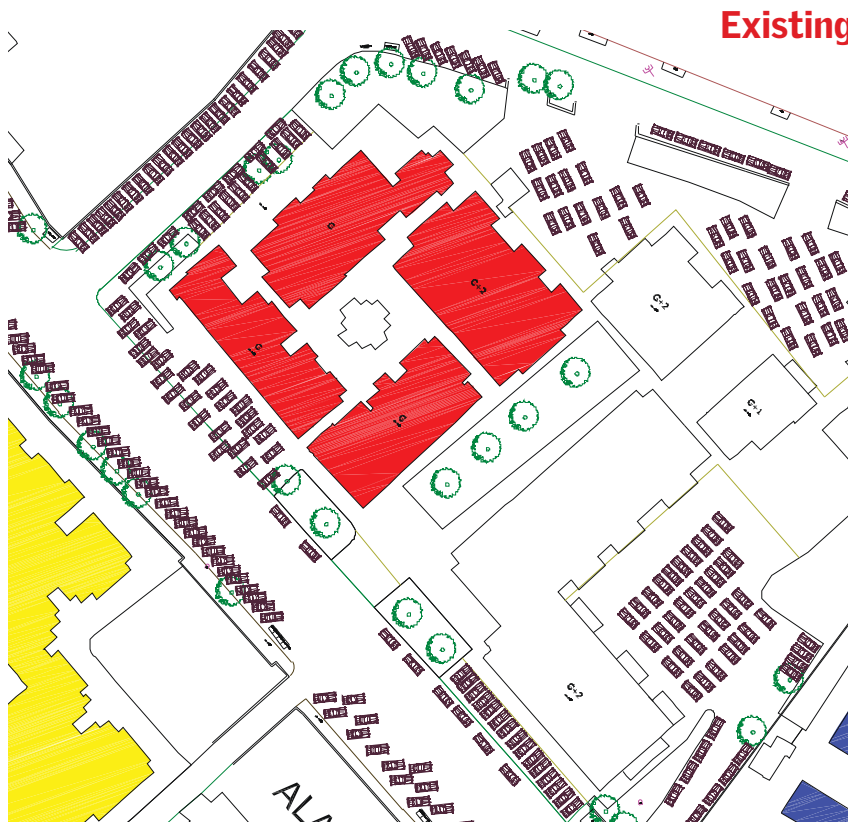
### Proposed



- Designated hawker zone
- Mid-block pedestrian crossing
- Space for on-street parking

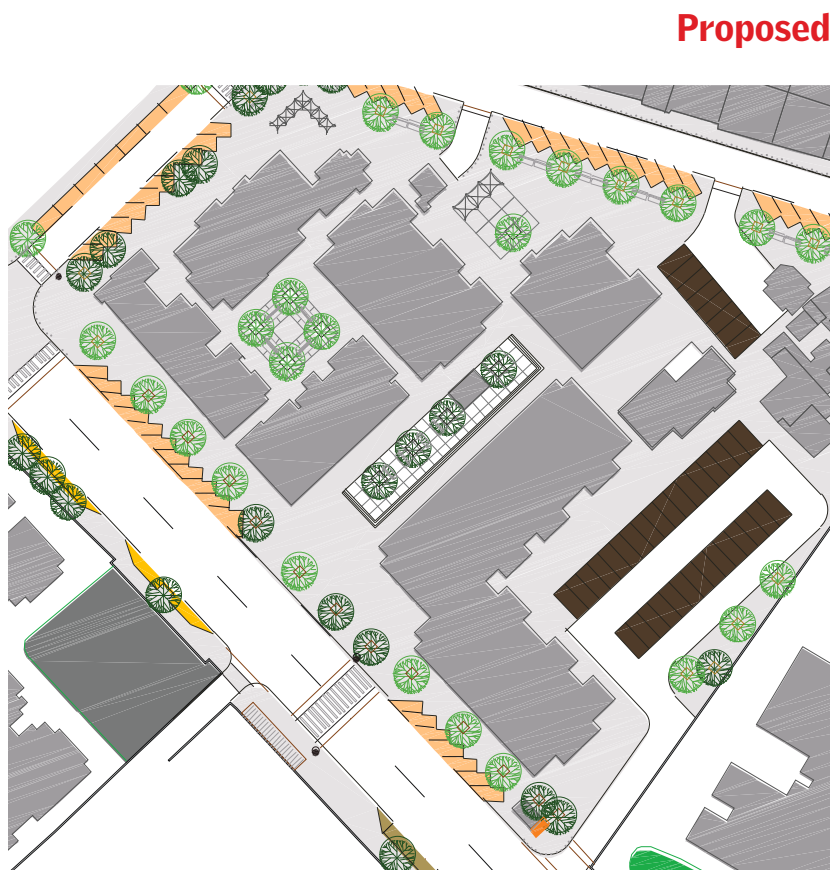


## Annexure 6: Plan showing existing condition and proposal for road opposite Alaknanda market



Existing

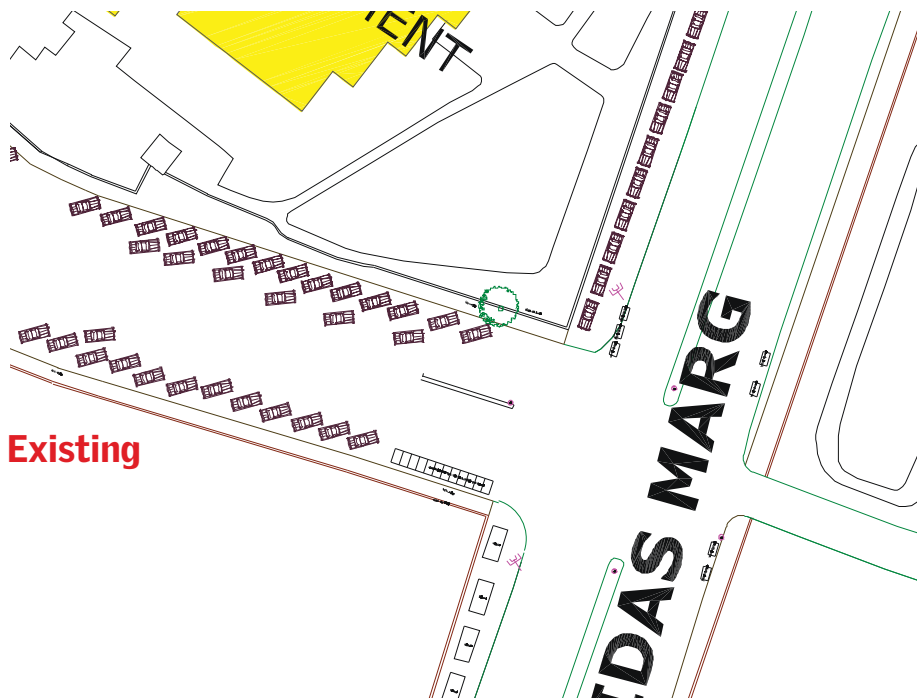
- Unsafe intersection and crossing
- Unorganised parking for cars Two-wheelers and IPT (Intermediate Public Transport)
- No designated space for hawkers
- Poorly designed off-street parking



Proposed

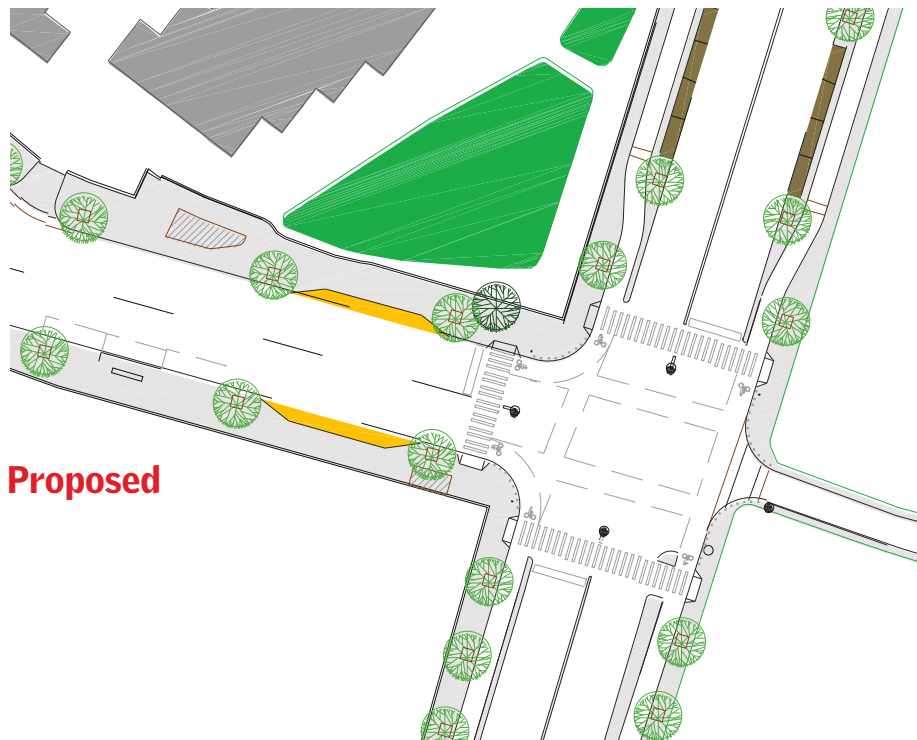
- Designated hawker zone
- Five metre wide mid-block pedestrian crossing
- Designated IPT parking
- Wide tree-lined plaza
- Improved off-street parking

## Annexure 7: Plan showing existing condition and proposal for Tara Apartment intersection



**Existing**

- Unsafe and poorly designed intersection
- No space for NMT on Guru Ravidas Marg
- Spillover of cars from Tara Apartment
- Parking pressure from adjacent colonies

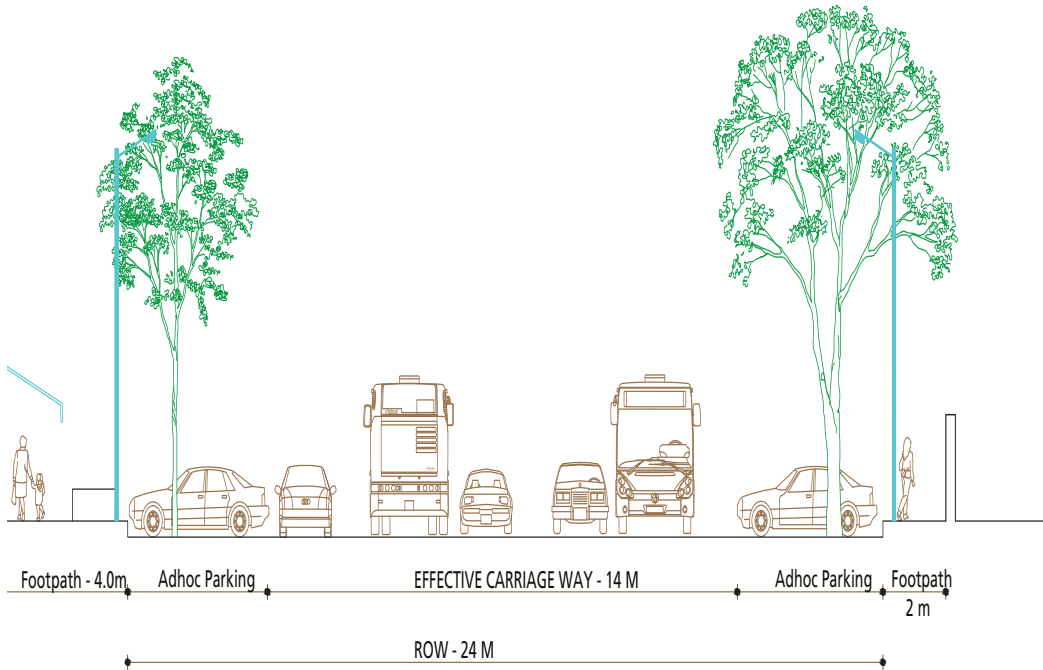


**Proposed**

- Designated space for IPT (Auto-rickshaws)
- 30 m ROW with segregated NMT track ,MUZ with parking for Grameen Sewa + bus stop

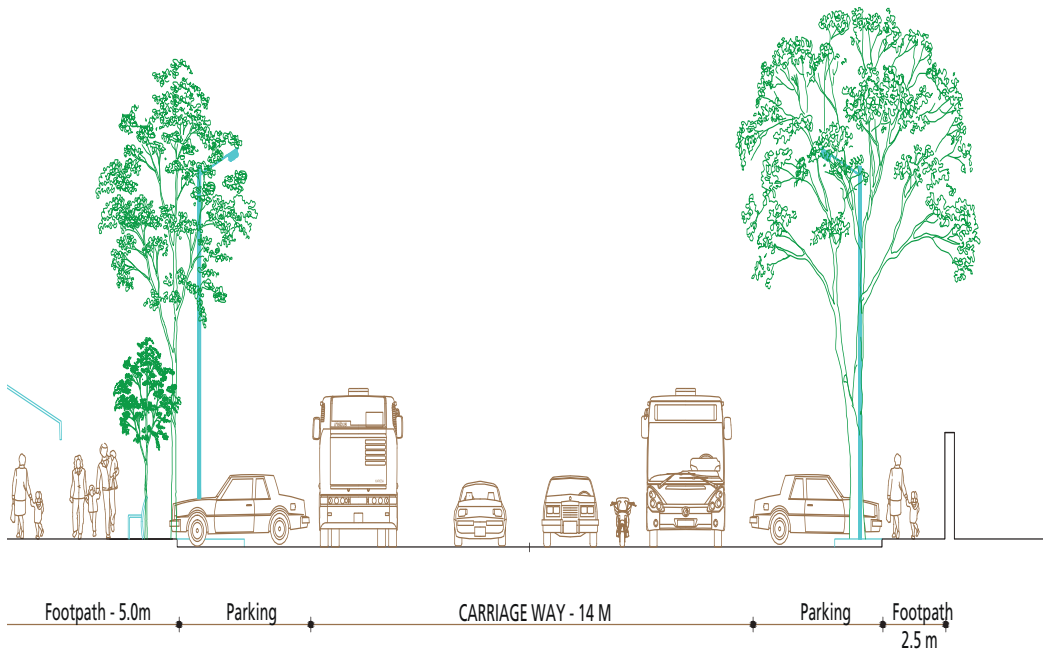
# Annexure 8: Plan showing existing and proposed cross section for Alaknanda road

Alaknada Road  
24m ROW



Existing

- After meeting the needs of all road users and hawkers, the original width of the carriageway can be maintained



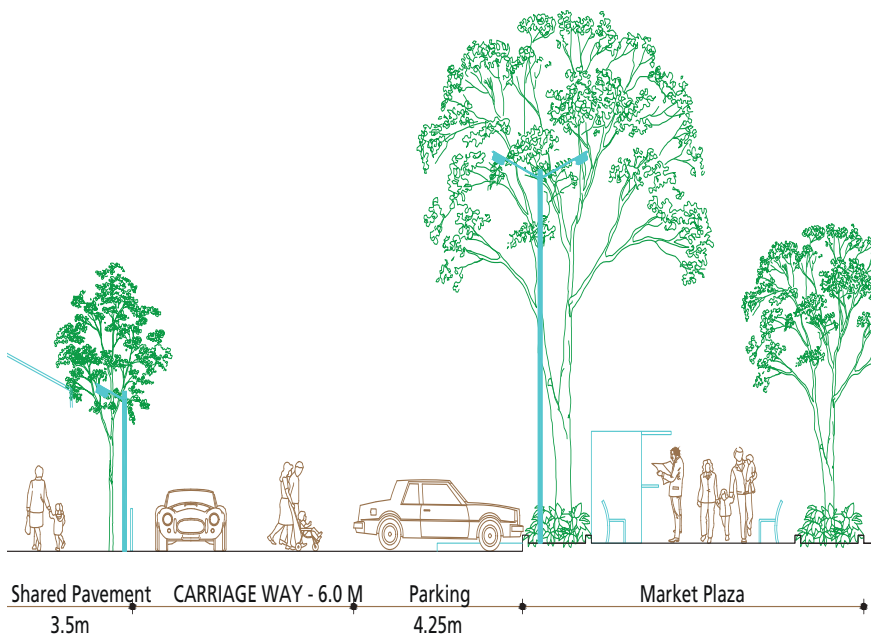
Proposed

# Annexure 10: Plan showing existing and proposed cross section for DDA Flats road

## DDA Flats Road



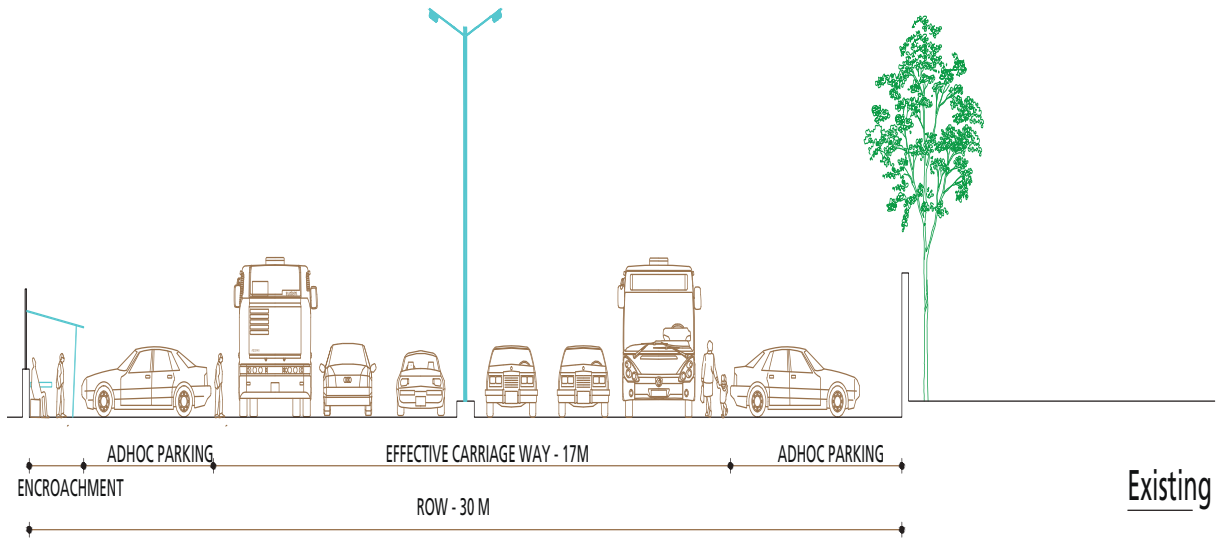
Existing



Proposed

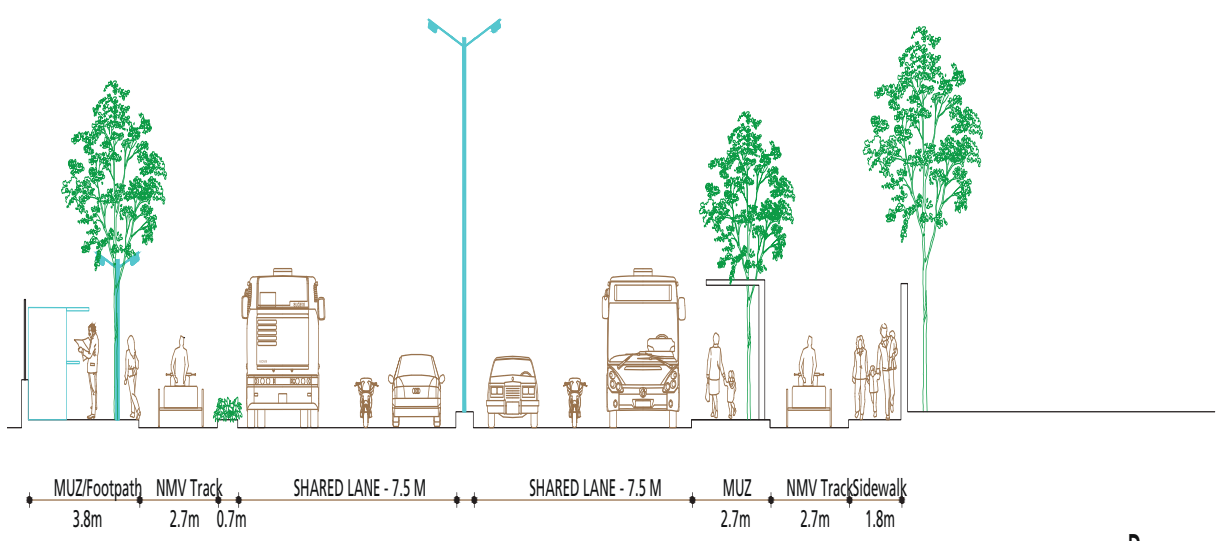
# Annexure 10: Plan showing existing and proposed cross section for Guru Ravidas Marg

## Guru Ravidas Marg (30M ROW)



Existing

- Segregated and safe lanes can be created for all road users



Proposed



**Centre for Science and Environment**

41, Tughlakabad Institutional Area, New Delhi 110 062

Phones: 91-11-40616000

Fax: 91-11-29955879 E-mail: [cse@cseindia.org](mailto:cse@cseindia.org)

Website: [www.cseindia.org](http://www.cseindia.org)