



Road safety for Children and Adolescents

Shri Mhalsakant Junior College, Pimpri – Chinchwad

April 24



Contents

1	Introduction	6
1.1	Safety Audit.....	6
1.2	About School Zone	7
1.3	Stakeholders for safer school zone.....	8
2	Design Guidelines.....	10
2.1	School Access Zone (SAZ).....	11
2.2	School Proximal Zone.....	11
2.3	School Transition Zone	12
2.4	Speed Management in School Zones	13
2.5	School entry/exit gate	14
2.6	Pick & Drop Areas.....	15
2.7	Walking Infrastructure.....	16
2.7.1	Footpaths.....	16
2.7.2	Guard Rail.....	17
2.7.3	Pedestrian Crossing	17
2.7.4	Pedestrian Refuge Islands.....	18
2.8	Cycling Infrastructure	19
2.9	Public transit stops within School Zone.....	19
2.10	Road Markings.....	19
2.11	Parking.....	20
3	Signs and descriptions	22
3.1	Standards for School Signs.....	26
3.2	School Zone Templates	27
4	School Zone Safety Audit.....	29
4.1	Demographic details of the school	29
4.2	Field Study	29
4.3	Safety Issues and Recommendation	30
4.4	Field Study	37
4.4.1	Proposed Layout Map for Road Signage and Marking	38
4.4.2	List of required Road Signage and Quantity	42
4.4.3	Quantity for Road Marking.....	45
5	Project Highlights	46

LIST OF FIGURES

Figure 1 Extent of School Proximal Zones and School Access Zones	11
Figure 2 Extent of School Proximal Zones and School Access Zones	12
Figure 3 Extent of School Proximal Zones and School Access Zones	13
Figure 4 Typical illustration of various measures required for the School Gate located on the Midblock Location of Two-Lane Bidirectional Road.....	14
Figure 5 School Entry and Exit Gates	14
Figure 6 Lane Narrowing.....	14
Figure 7 Speed Table.....	15
Figure 8 Trapezoidal Hump – Flat top with tapered sides	15
Figure 9 Circular Hump - Shape of a circular Arc.....	15
Figure 10 Textured Paving over Raised Crossings	15
Figure 11 School Bus Danger Zone	16
Figure 12 Pick-up and Drop Off Zone.....	16
Figure 13 Pick and drop facility for private vehicles.	16
Figure 14 Pedestrian Facility	16
Figure 15 Guard rails and organization of pedestrian space	17
Figure 16 Intersection falling within a school zone	17
Figure 17 Table-top crossing.....	18
Figure 18 Refuge Island with safe gap for pedestrians	18
Figure 19 Cycle Track in Delhi	19
Figure 20 Racks for stacking and parking bicycles	19
Figure 21 Public transit stops falling within a school zone.....	19
Figure 22 Sample Pavement marking as per IRC 35: 2015 and IRC SP 32: 2023 ..	20
Figure 23 Parking design as per IRC: 67, IRC: 103, IRC: 35	21
Figure 24 School zone area signs as per MUTCD	26
Figure 25 Typical Illustration of Various Measures required for the School Gate located on the Midblock Location of Two Lane Bidirectional Road	27
Figure 26 Typical Illustration of various measures required for the school gate located on midblock section of a four-lane divided road.....	27
Figure 27 Typical Illustration of school signs as per MUTCD	28
Figure 28 Study Area	29
Figure 29 School Access and Proximal Zones.....	29
Figure 30 Views of various Road Signs and Zones (Source IRC:SP:32-2023)	37
Figure 31 Meeting with Stakeholders	47

LIST OF TABLES

Table 1 Radius for School Proximal Zone (Source IRC: SP: 32-2023)	11
Table 2 Applicable zone radius extension covering the various functional classification of urban & interurban roads	12
Table 3 Length of transition zone & applicable speed limit in SPZ (Source IRC: SP: 32-2023).....	13

Executive Summary:

The Road Safety for School Zone conducted for Shri Mhalsakant Junior College in Nigdi aims to comprehensively assess the safety measures and potential hazards for vulnerable road users, especially children along the designated route. This audit, undertaken by a team of experienced professionals, addresses critical factors affecting road safety, including infrastructure design, speed and traffic flow control, signage and road marking, and environmental conditions.

Key Findings:

1. Infrastructure Evaluation:

- Detailed analysis of road geometry, alignment, and intersections reveal areas prone to accidents or congestion.
- Identification of potential safety enhancements such as lane widening, shoulder improvements, and intersection redesign to mitigate risks.

2. Traffic Flow and Control:

- Examination of traffic volume, speed limits, and congestion patterns highlights areas requiring better traffic management strategies.
- Recommendations for optimizing traffic flow, including signal timing adjustments, lane reconfiguration, and implementation of traffic calming measures.

3. Signage and Markings:

- Assessment of signage visibility, placement, and adequacy to provide clear guidance to drivers.
- Proposals for upgrading signage and pavement markings to enhance visibility and reduce driver confusion.

4. Vulnerable Road Users:

- Consideration of pedestrian and cyclist safety through the evaluation of crosswalks, bike lanes, and pedestrian refuge islands.
- Suggestions for improvements such as enhanced lighting, pedestrian-friendly infrastructure, and dedicated cycling paths.

5. Environmental Factors:

- Examination of environmental conditions such as lighting, weather, and road surface quality impacting road safety.
- Recommendations for mitigating environmental hazards, including improved drainage systems, vegetation management, and surface treatments.

Recommendations:

Based on the findings of the road safety audit, the following recommendations are proposed to enhance safety along the designated route:

- Implementation of targeted infrastructure improvements to address identified hazards and enhance overall road safety.
- Adoption of traffic management measures to optimize traffic flow and reduce the risk of accidents.
- Upgrading signage, markings, and lighting to improve visibility and guidance for road users.
- Incorporation of pedestrian and cyclist-friendly features to prioritize vulnerable road users.
- Continued monitoring and evaluation of safety measures to ensure ongoing effectiveness.

Conclusion:

The road safety audit provides valuable insights into the current state of road safety along the designated route and offers practical recommendations for improving safety conditions. By implementing the proposed measures, stakeholders can significantly reduce the risk of accidents, injuries, and fatalities, creating safer and more sustainable transportation infrastructure for all road users.

1 Introduction

1.1 Safety Audit

Road Safety Audit (RSA) is a formal procedure for assessing accident potential and safety performance in the provision of new road schemes and schemes for the improvement and maintenance of existing roads. Road safety audits assess the operation of a road, focusing on road safety as it affects the users of the road. These users include pedestrians, cyclists, motorcyclists, truck/bus drivers, on-road public transport users, etc. The outcome of a road safety audit is the identification of any road safety deficiencies and formulation of recommendations aimed at removing or reducing those deficiencies.

What is **School Child Road Safety**? In this context, it becomes particularly crucial to extend the focus to the safety of school children who are among the most vulnerable road users. Incorporating a specific consideration for the unique needs and behaviors of school children in road safety audits is essential to ensure safe access to school. These audits should consider factors such as the presence of school zones, proximity to educational institutions, and patterns of student commuting. Assessments include the examination of designated school crossings, sidewalks, and nearby intersections to identify potential hazards that may pose risks to children walking, cycling, or being dropped off at school. Recommendations stemming from road safety audits should, therefore, encompass measures tailored to enhance the safety of school children, such as implementing additional crosswalks, improving signage, establishing school-specific speed limits, and ensuring the presence of safe and well-marked pedestrian pathways. By integrating a child-centric approach into road safety audits, we can contribute to creating safer environments for young pedestrians and cyclists as they navigate the roads to and from school.



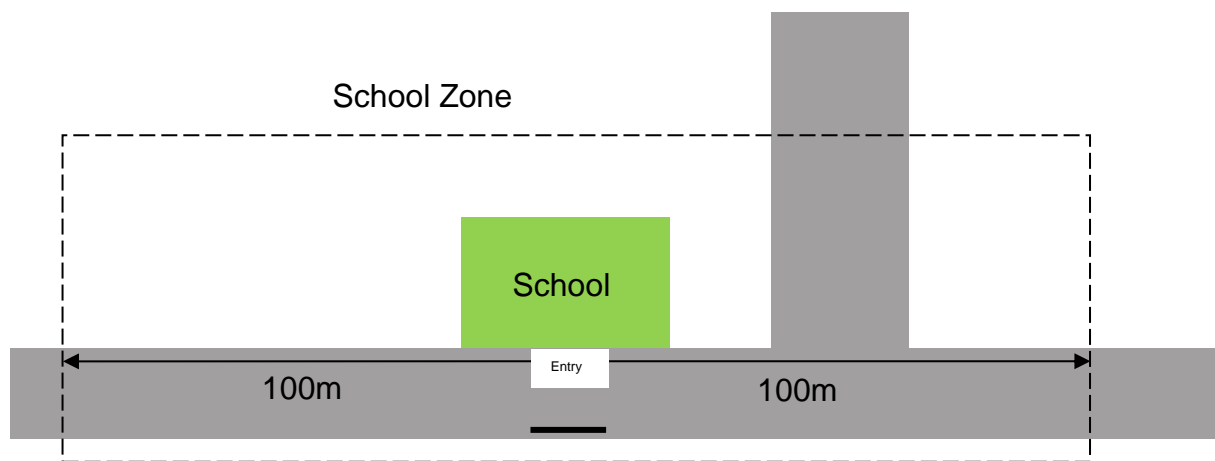
‘Children seen holding hands to cross due to fear of safety’

The primary purpose of this report is to comprehensively assess the current state of school zone safety and provide informed recommendations for improvement. By examining various facets, including infrastructure, traffic flow, enforcement measures,

and community involvement, the report aims to identify key areas of concern and suggest practical strategies to enhance safety.

1.2 About School Zone

The school zone is the immediate area around the school within which most students are present, as they commute between home and school either on foot, cycle or public transport. (*Source: Draft IRC SP32*). These zones see high footfall of children and their caregivers, especially during school hours in the morning, afternoon and evening. This guideline considers a stretch of 100m on either side of the school entrance as a 'School zone'. This guideline defines 'school' as various types of educational centers serving all age groups of children i.e., kindergarten, anganwadis, primary, secondary and higher secondary schools.



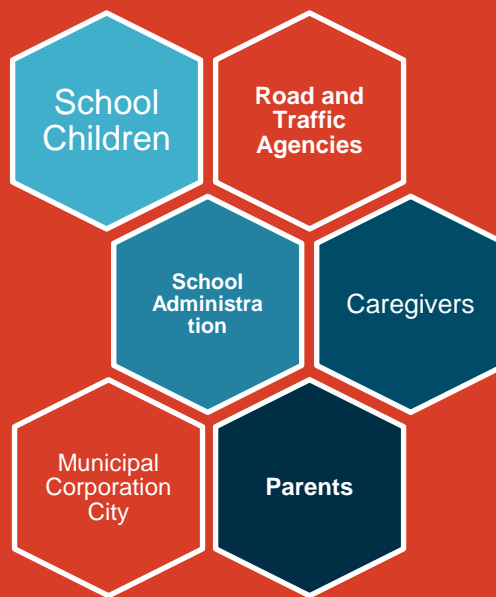
School zones can be defined by considering the following aspects:

- Location parameters include the type of roads within the school zone area which can be ranging from kaccha (unpaved) road to national highways. Type of intersecting area, i.e. signalized, un-signalized, roundabout, grade separators, etc.
- The layout of existing schools may have entry/exit gates opening on road/service lanes/at intersection. This also includes the activity on the street based on adjoining plots and land use.
- School bus parking and drop off/ pick up area should be provided within or outside the school premises. Commuting to school also involves provision of parking space for children commuting by cycle, teachers, and staff vehicles within the campus. Further, it should encompass designated drop off locations for school vans, bicycles, and para transit such as rickshaw, e-rickshaw, three wheeled auto rickshaw, three wheeled auto rickshaw parking.
- Considering the decreasing likelihood of presence of school children as one moves away from a school, a school zone shall be divided into the school

access zone and the school proximal zone. This is further supplemented by a Transition Zone which will not be a part of the school zone, but it should be considered as essential component aimed at providing smooth transition into the school zone.

1.3 Stakeholders for safer school zone

Ensuring the safety of school children involves the collective commitment of various stakeholders, each playing a pivotal role in creating secure and conducive environments. Some of the key contributors to this shared responsibility include:



- a. **Road and Traffic Agencies:** These agencies are instrumental in designing and maintaining road geometry tailored to the specific requirements of school zones. Beyond infrastructure, they manage traffic through effective measures such as traffic calming strategies, with local traffic police taking charge of enforcement to ensure compliance with safety regulations.
- b. **School Administration:** School administrators shoulder the responsibility of implementing temporary traffic management measures during school hours, collaborating with local traffic authorities or the School Management Committee. They also oversee the safe transportation of students, particularly when involving private contractors. In instances of overlapping school zone areas, strategic scheduling with staggered opening and closing times becomes essential.
- c. **Parents:** As essential stakeholders, parents contribute significantly to their children's safety. Adhering to a safety checklist is imperative, involving cooperation with transportation services, utilizing designated drop-off and pick-up points, and staying informed about road safety guidelines.

- d. **Children:** Empowering children with knowledge about road safety is crucial. A comprehensive list of do's and don'ts serves as an educational tool, encompassing safe pedestrian practices, understanding traffic signals, and emphasizing the importance of vigilance during their commute.

Through a collaborative effort among these stakeholders and a clear delineation of their roles, a holistic approach to school zone safety can be realized, prioritizing the protection and well-being of every child.

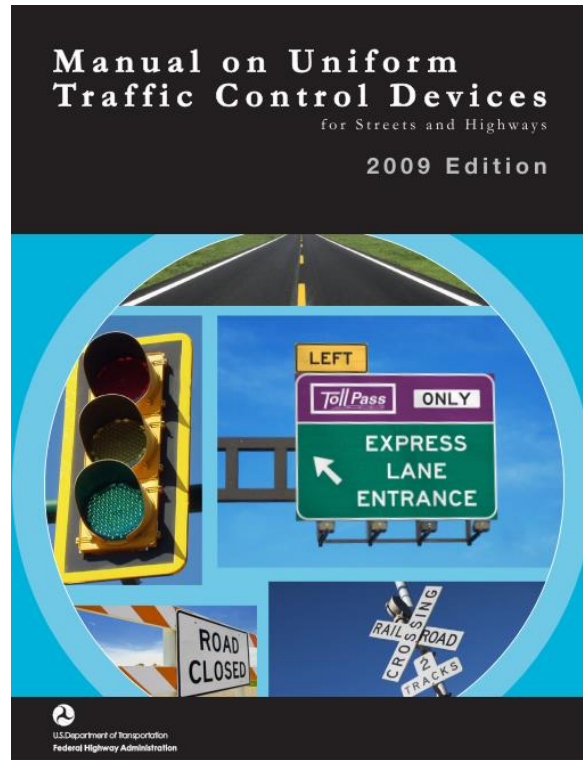
2 Design Guidelines

IRC:SP:32-2023

GUIDELINES FOR SAFER COMMUTE TO SCHOOLS

(First Revision)

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School Priority Zone Guidelines

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2.1 School Access Zone (SAZ)

School Access Zone (SAZ) can be understood as the road leading to every entrance of the school, extending 100 m on either side. If a school has more than one entrances, it can have more than one access zones.

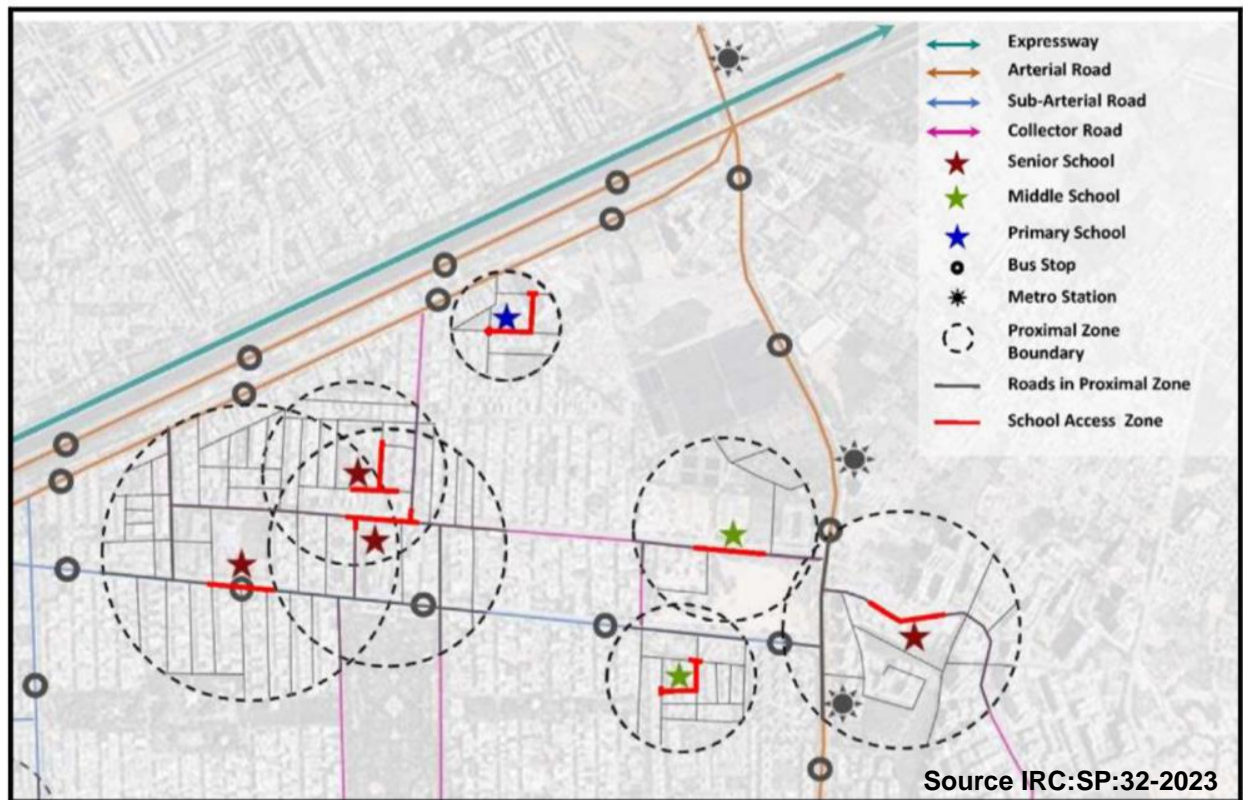


Figure 1 Extent of School Proximal Zones and School Access Zones

2.2 School Proximal Zone

School Proximal Zone (SPZ) can be considered as an area around a school. The table provides the radius of the school zone to be measured from school for defining school proximal zone.

Table 1 Radius for School Proximal Zone (Source IRC: SP: 32-2023)

Road Type	Primary (meters)	Secondary (meters)	Senior Secondary
Urban Roads/ Interurban roads	400	450	500
Arterial Roads/Highways	300	350	400
Collector street/ Other district roads	200	250	300
Local Streets/Other Roads (including PMGSY Roads)	150	200	250

Source IRC:SP:32-2023

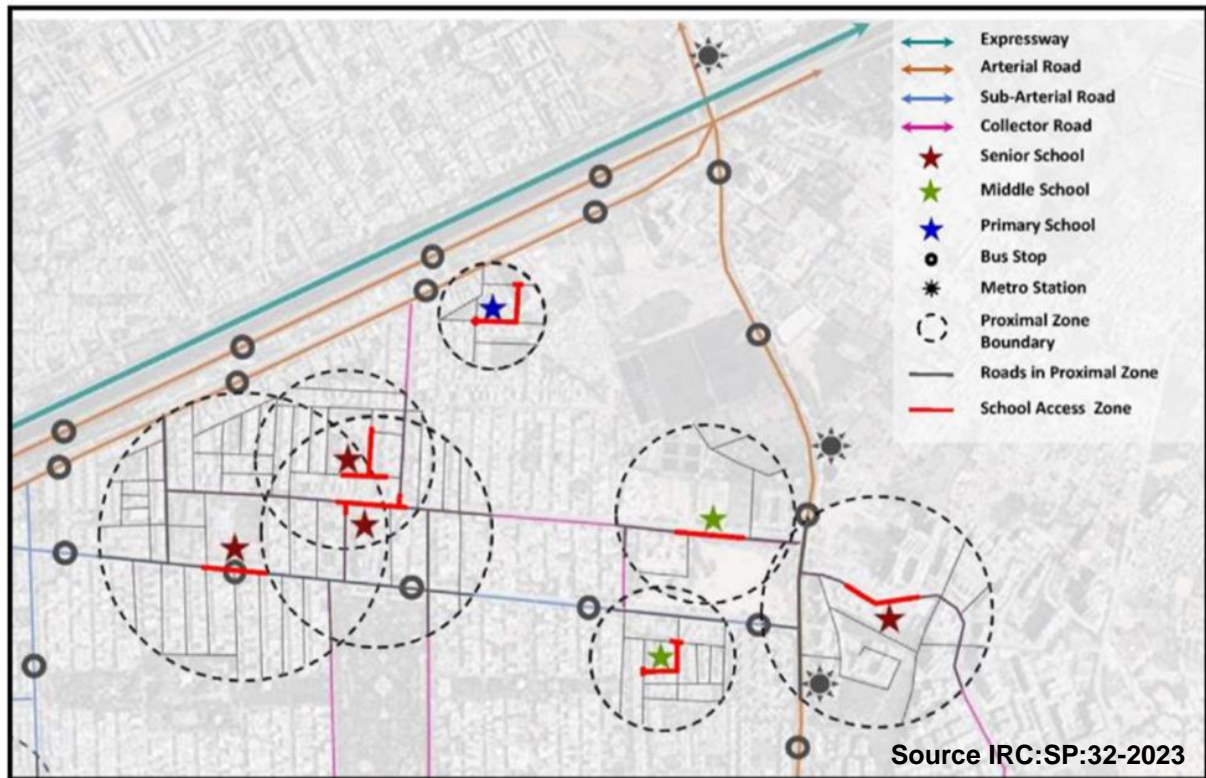


Figure 2 Extent of School Proximal Zones and School Access Zones

2.3 School Transition Zone

Motorists entering a school zone need to be forewarned about the special nature of this zone, by means of a transition zone (or stretch). As a rule of thumb, the following values can be considered as transition stretches according to the design speeds and road categories are presented in the table.

Table 2 Applicable zone radius extension covering the various functional classification of urban & interurban roads

Road Type	Design Speed as per IRC:86 (kmph)	Secondary (meters)	Senior Secondary
Arterial Roads/Highways	60	30	70
Sub Arterial Road/Major District Roads	60	30	45
Collector street/ Other district roads	40	30	35
Local Streets/Other Roads (including PMGSY Roads)	30	20	20

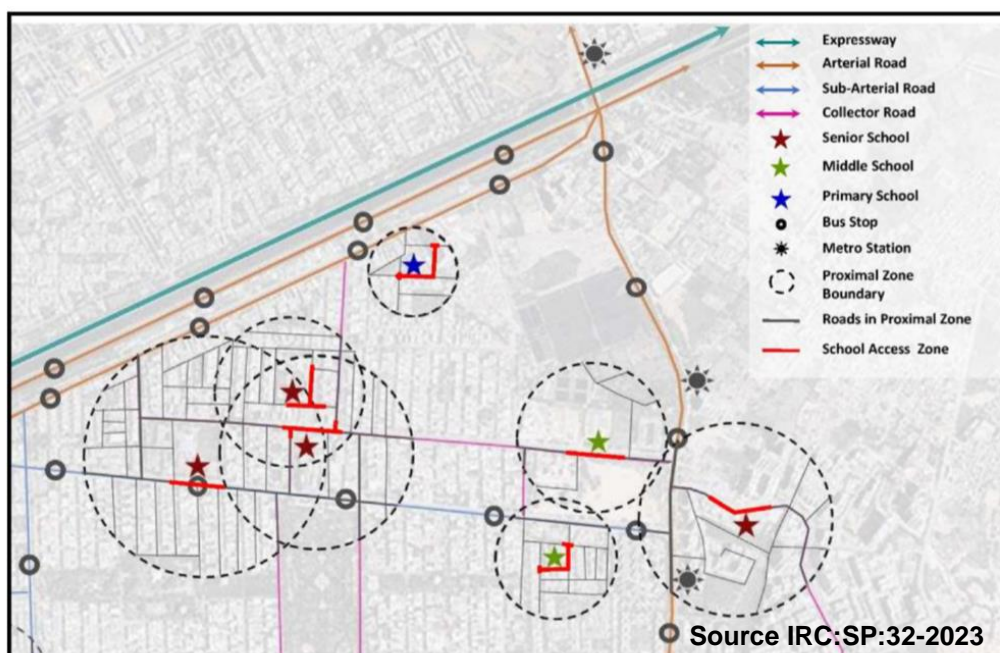


Figure 3 Extent of School Proximal Zones and School Access Zones

2.4 Speed Management in School Zones

Speed calming needs to enforce in school zones to ensure students safety, due to the following: -

- An **increase in average speed** is directly related both to the likelihood of a crash occurring and to the severity of the consequences of the crash.
- The death risk for pedestrians hit by car fronts rises rapidly **(4.5 times from 50 km/h to 65 km/h)**.
- In car-to-car side impacts the fatality risk for car occupants is **85% at 65 km/h**.

Speed management in school zones

- ▶ Enforcing fixed speed limits
- ▶ Enforcing time specific speed limit

Threshold values for prescribed vehicular speeds within school zones.

Table 3 Length of transition zone & applicable speed limit in SPZ (Source IRC: SP: 32-2023)

Road Type	Design Speed as per IRC:86 (kmph) Secondary (meters)	Preferred methods for enforcing speed limits	Road Type
Urban Roads/ Interurban roads	SAZ	SPZ	500
Arterial Roads/Highways	25	30	Arterial Roads/Highways

Sub Arterial Road/Major District Roads	25	30	Sub Arterial Road/Major District Roads
Collector street/ Other district roads	25	30	Collector street/ Other district roads



Figure 4 Typical illustration of various measures required for the School Gate located on the Midblock Location of Two-Lane Bidirectional Road

2.5 School entry/exit gate

Ensure speed reductions using through provision of traffic calming measures like speed breakers, raised crossings, narrowing of road width coupled with provision of relevant road signs and markings.

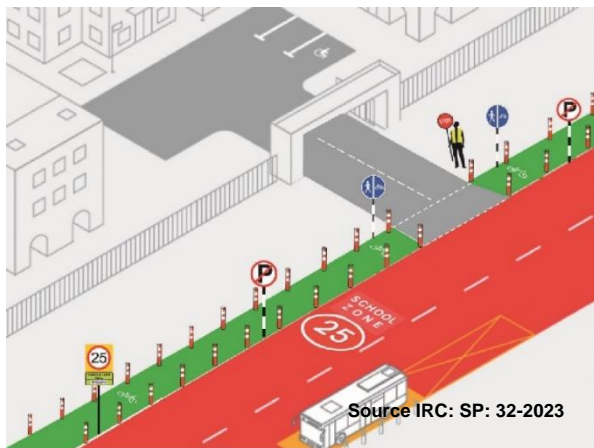


Figure 5 School Entry and Exit Gates

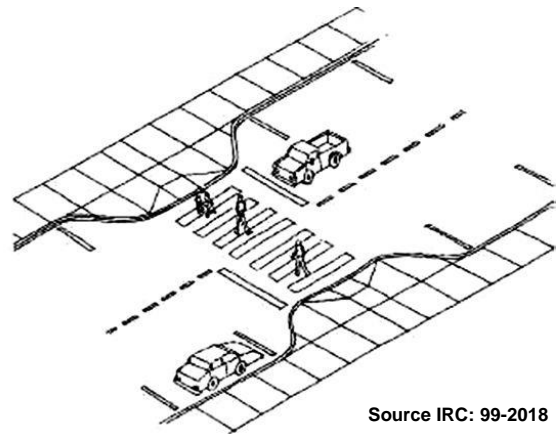


Figure 6 Lane Narrowing



Figure 7 Speed Table



Figure 8 Trapezoidal Hump – Flat top with tapered sides

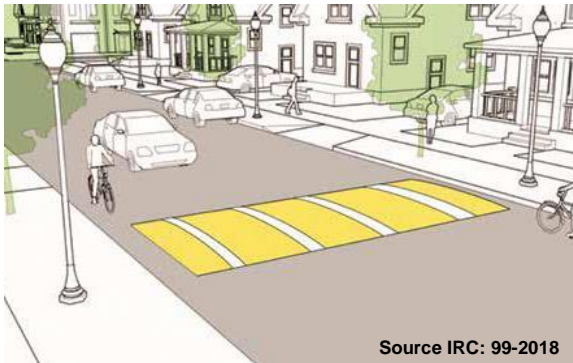


Figure 9 Circular Hump - Shape of a circular Arc



Figure 10 Textured Paving over Raised Crossings

2.6 Pick & Drop Areas

Pick and drop facilities include provisions for school bus and private modes (auto-rickshaws, vans, cycles, four and two-wheeler).

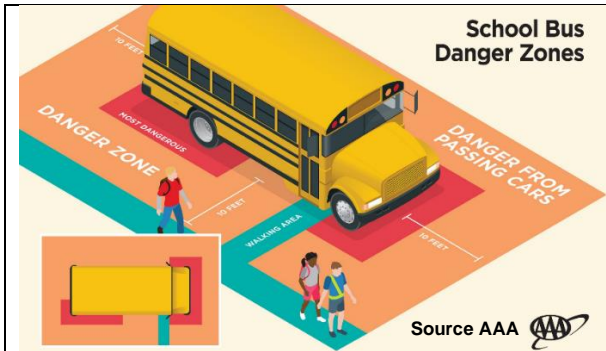


Figure 11 School Bus Danger Zone

The “Danger Zone” is the area on all sides of the bus where children are in the most danger of not being seen by the driver (3m in front, 3m on either side of the bus, and 3m behind are all areas where a child may be in the driver’s blind spot).

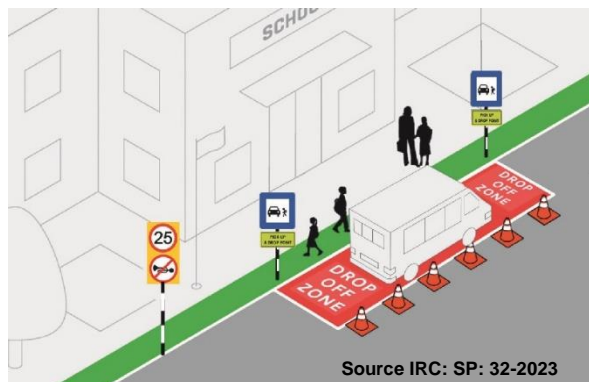


Figure 12 Pick-up and Drop Off Zone



Figure 13 Pick and drop facility for private vehicles.

2.7 Walking Infrastructure

2.7.1 Footpaths

For collector roads and above, raised footpath should be provided on both sides of the carriageway, as per dimensions and specifications mentioned in the IRC:103, with a minimum of 2m clear width on footpath and minimum 3m one way bicycle track.



Figure 14 Pedestrian Facility

2.7.2 Guard Rail

Guard rails are essential to prevent children from running on to the roads.



Source IRC:SP:32-2023

Figure 15 Guard rails and organization of pedestrian space

2.7.3 Pedestrian Crossing

All pedestrian crossings shall conform to IRC:103, i.e, within the range of 2-4m.



Source IRC:SP:32-2023

Figure 16 Intersection falling within a school zone



Source IRC:SP:32-2023

Figure 17 Table-top crossing

2.7.4 Pedestrian Refuge Islands

To provide a place of safety to pedestrians crossing wide streets



Source IRC:SP:32-2023

Figure 18 Refuge Island with safe gap for pedestrians

2.8 Cycling Infrastructure

Cycling infrastructure has no value when provided on a road has no value unless it is planned at a network level. Cycle parking should be installed either within the school premises or along the compound wall of the school.



Figure 19 Cycle Track in Delhi



Figure 20 Racks for stacking and parking bicycles

2.9 Public transit stops within School Zone

- Public transit stops falling within school zones must make sure the bus stops are accessible by children (i.e. height of bus stop flooring not more than 150mm)
- It should be robust with anti-skid, levelled floor space and with preferably cantilever roof, sufficient shade and light along with route information display maps, statutory signs etc.



Figure 21 Public transit stops falling within a school zone

2.10 Road Markings

Road Markings will conform to IRC: 35 2015

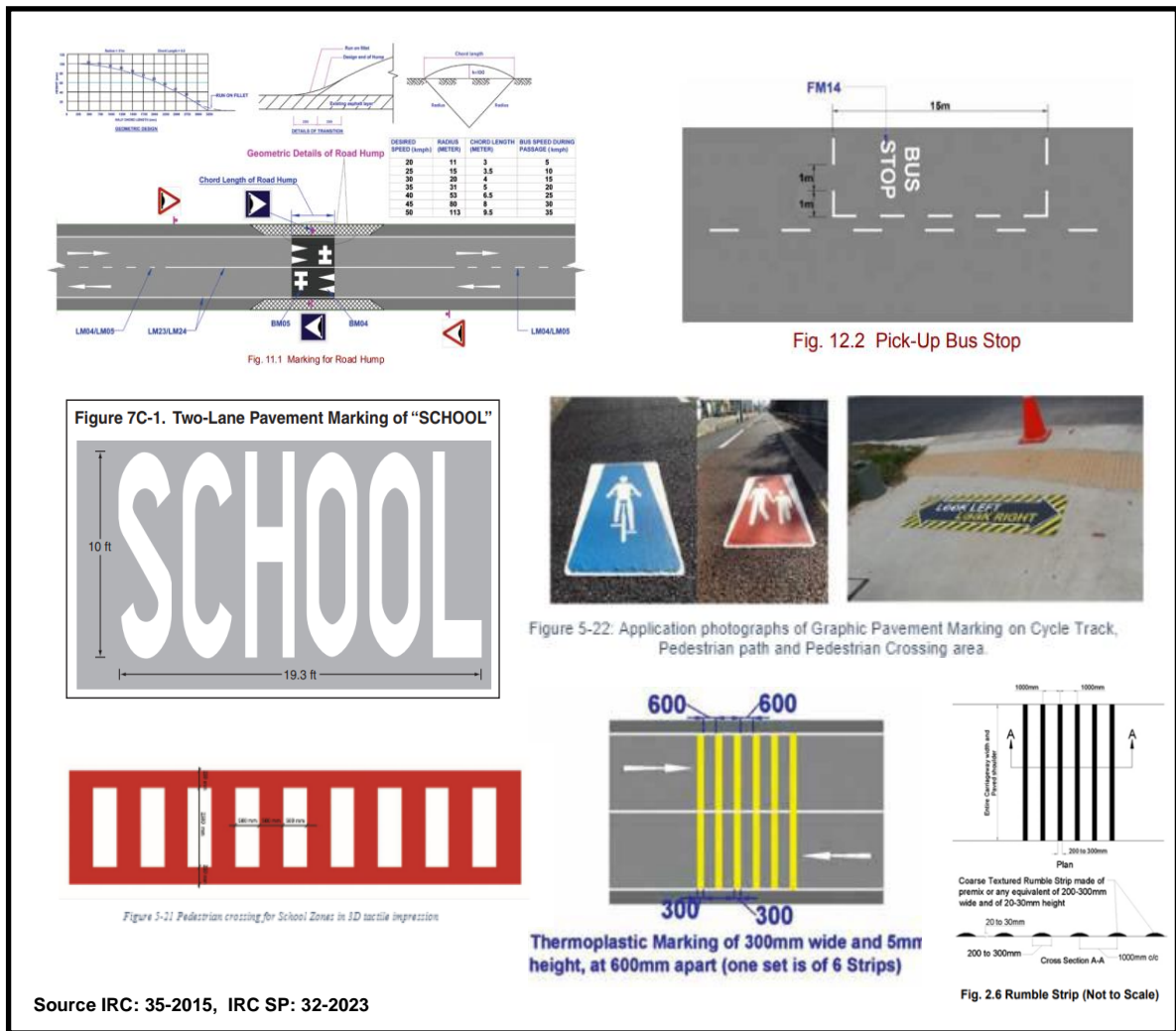


Figure 22 Sample Pavement marking as per IRC 35: 2015 and IRC SP 32: 2023

2.11 Parking

- ▶ All on street Parking should be discouraged from SAZ, especially on the road adjacent to schools especially during school hours.
- ▶ It shall be the responsibility of the SMCs to notify the local police about the school hours, for appropriate enforcement.
- ▶ Where provided, on-street parking must adhere to the parking norms provided in IRC:67, IRC:103, IRC:35.

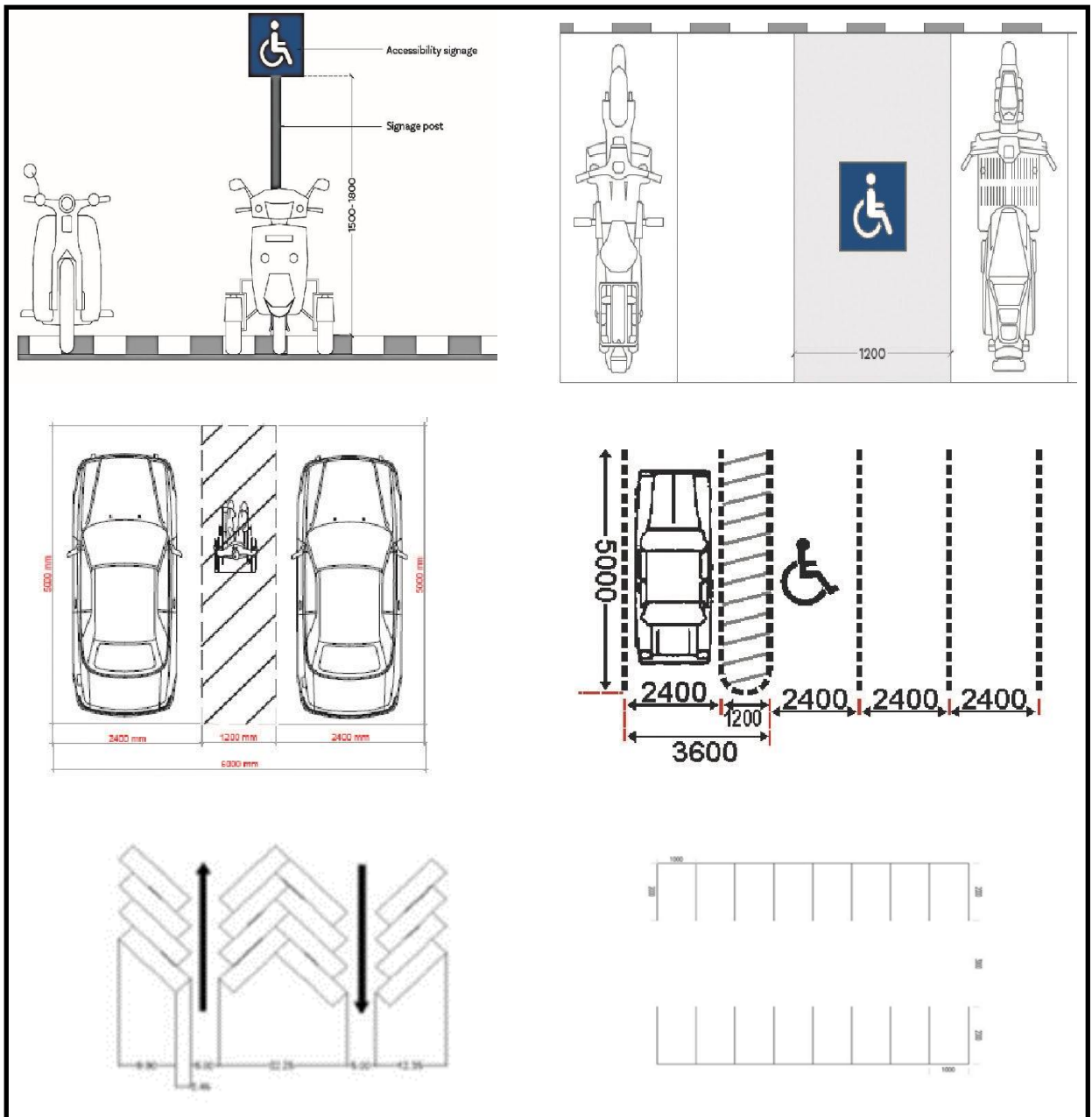

















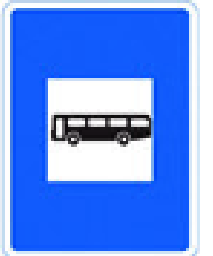









Figure 23 Parking design as per IRC: 67, IRC: 103, IRC: 35

3 Signs and descriptions

Sign and Description	Figure
Mandatory / Regulatory and Compulsory	Direction Control Signs
To be located at stretch, where vehicle need to stop before entering a main carriageway.	 <p>Stop Sign</p>
To reduce vehicle speed to improve pedestrian safety during times of high pedestrian activity (i.e. arrival and dismissal). Oversized sign may be used for applications that require increased emphasis, improved recognition or increased legibility.	 <p>Speed Limit Sign</p>
For sections of bad accident history or substandard curves, speed limit sign can be provided in yellow backing board to make it more prominent.	 <p>Speed Limit Sign with Backing Plate</p>
The sign should be provided on the roads where No Parking of vehicles is allowed. This sign may be used along with time restriction indicating morning and evening peak periods.	 <p>Parking Prohibited</p>
The sign should be erected where parking is not allowed on the footpath.	 <p>Parking Prohibited on the Footpath</p>
This sign shall indicate the point at which all prohibitions notified at the beginning of school zone for moving vehicles ceases to apply.	 <p>Restriction Ends</p>

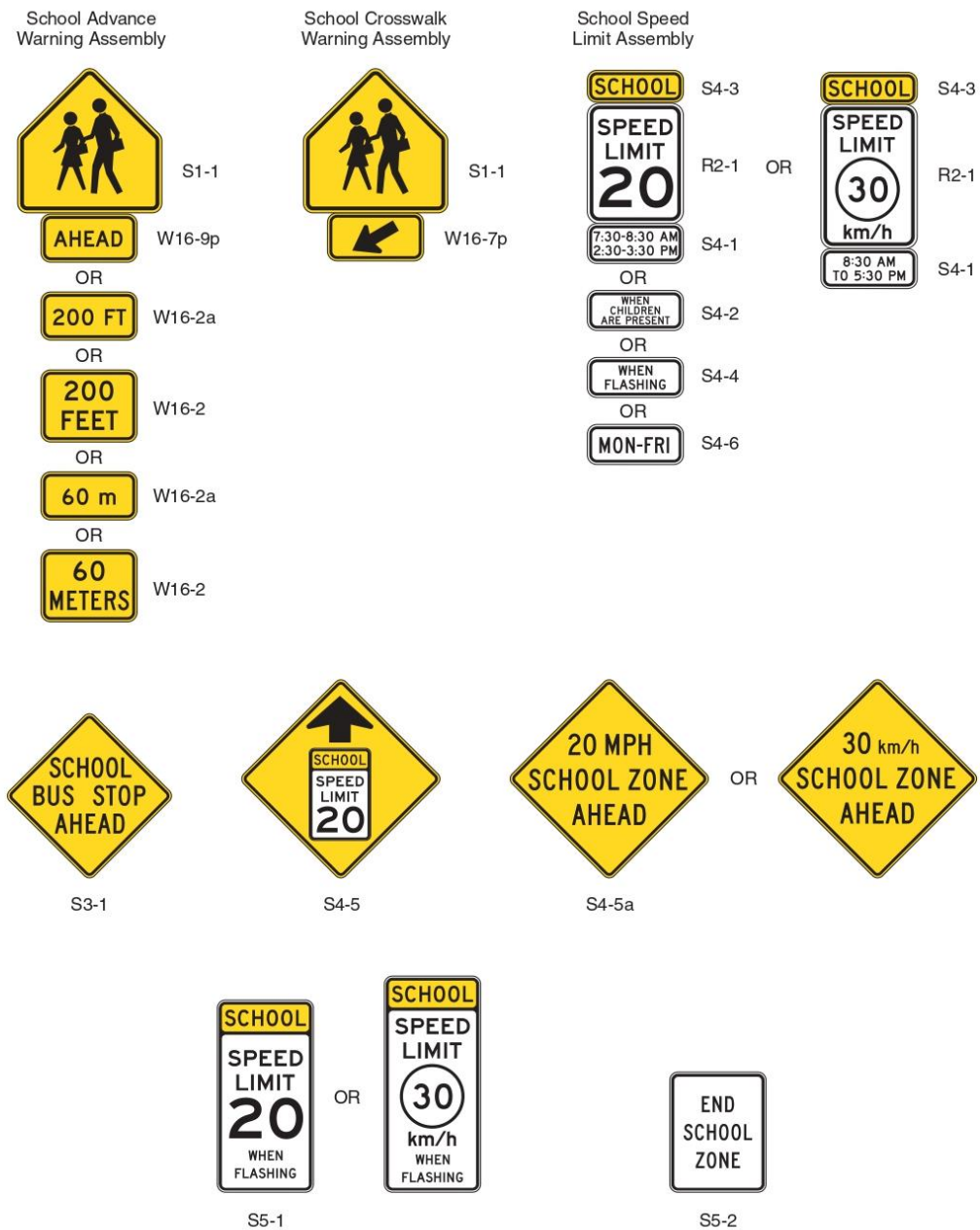
<p>This sign shall mean that only pedestrians are allowed, and the traffic is not allowed on this road / carriageway. The sign may be supported by supplementary plate with "PEDESTRIANS ONLY" written on it</p>	 <p>Pedestrian Only</p>
<p>The sign shall notify cyclists that they must use the cycle track at the entrance to which it is placed and shall notify the drivers of other vehicles that they are not entitled to use the track.</p>	 <p>Compulsory Cycle Track / Cycle Only</p>
<p>This sign shall be used to segregate cycle and pedestrian lanes.</p>	 <p>Compulsory Cyclist and Pedestrian Route</p>
<p>Cautionary Signs / Warning Signs</p>	
<p>Cautionary signs should be provided at the start of a school zone to warn motorists of the presence of a school and hence the possibility of children entering the roadway. The background of school zone ahead sign shall be fluorescent yellowgreen colour.</p>	 <p>School Ahead with fluorescent Yellow Green Background</p>
<p>The sign should be erected in advance on approaches to at-grade pedestrian crossing.</p>	 <p>Pedestrian Crossing</p>
<p>For sections of bad crash history or substandard curves, where visibility of the crossing is impaired by a bend or hump in the road pedestrian crossing sign can be provided in yellow backing board to make it more prominent.</p>	 <p>Pedestrian Crossing with Backing Board</p>

<p>This sign is posted in situations where the Cycle Route is approaching, and drivers are required to slow down. The sign should be erected in advance of cycle crossing.</p>	 Cycle Route Ahead
Facility Information Signs	
<p>This sign provided information about cycle lane to road users</p>	 Cycle Lane
<p>This sign shall be used to inform the vehicles about Contra flow of cycles and shall be installed before beginning of such lane.</p>	 Contra Flow Cycle Lane
<p>This sign shall be used at pedestrian crossing to inform the road users about the presence of pedestrian crossing.</p>	 Pedestrian Crossing Information
<p>This sign shall be installed near the speed breakers / Humps to inform the road users about the exact location of the hump.</p>	 Speed Hump
<p>This sign should be erected at the places where the buses are designed to stop.</p>	 Bus Stop
<p>This sign is installed to inform the drivers of the presence of reserved bus lane in the carriageway.</p>	 Bus Lane

<p>Dedicated and marked parking should be provided by the institution either within premises or at the entrance and shall not spill over to connected public roads.</p>	 <p>Parking</p>
<p>The accessible parking area should be indicated using a signage reserved for vehicle parking for users with disabilities. The wheelchair in the sign should always be shown facing to the right.</p>	 <p>Parking Information for Parking with Disabilities</p>
<p>The sign should be erected where the parking is not allowed to specific durations for traffic management.</p>	 <p>Parking Restriction for Traffic Management</p>
<p>The sign should be erected at Drop and Ride designated area for parents picking up or dropping their children by circulation of vehicles.</p>	 <p>Drop and Ride Facilities</p>
<p>Pickup and drop-off point near school entrances marked by wheelchair (access) symbol painted on the floor and on a pole of height 2 m shall be provided for passengers / children with impaired mobility as they often move slowly and therefore are more vulnerable.</p>	 <p>Accessible Boarding</p>
<p>Clear Road Marking to denote where parents are allowed to pick up and drop off the students.</p>	 <p>Marking of Student Drop off area</p>

3.1 Standards for School Signs

As per MUTCD: MUTCD provides guidelines for the installation positions of signs and plaques along with specific color requirements for school warning signs



Source MUTCD 11th edition, 2023

Figure 24 School zone area signs as per MUTCD

3.2 School Zone Templates

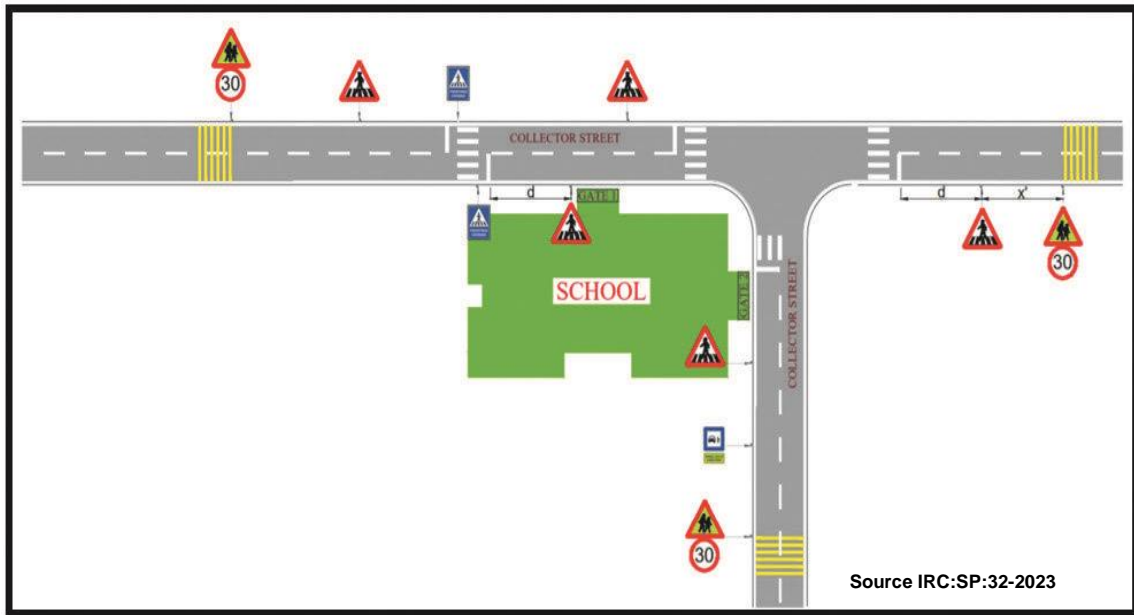


Figure 25 Typical Illustration of Various Measures required for the School Gate located on the Midblock Location of Two Lane Bidirectional Road

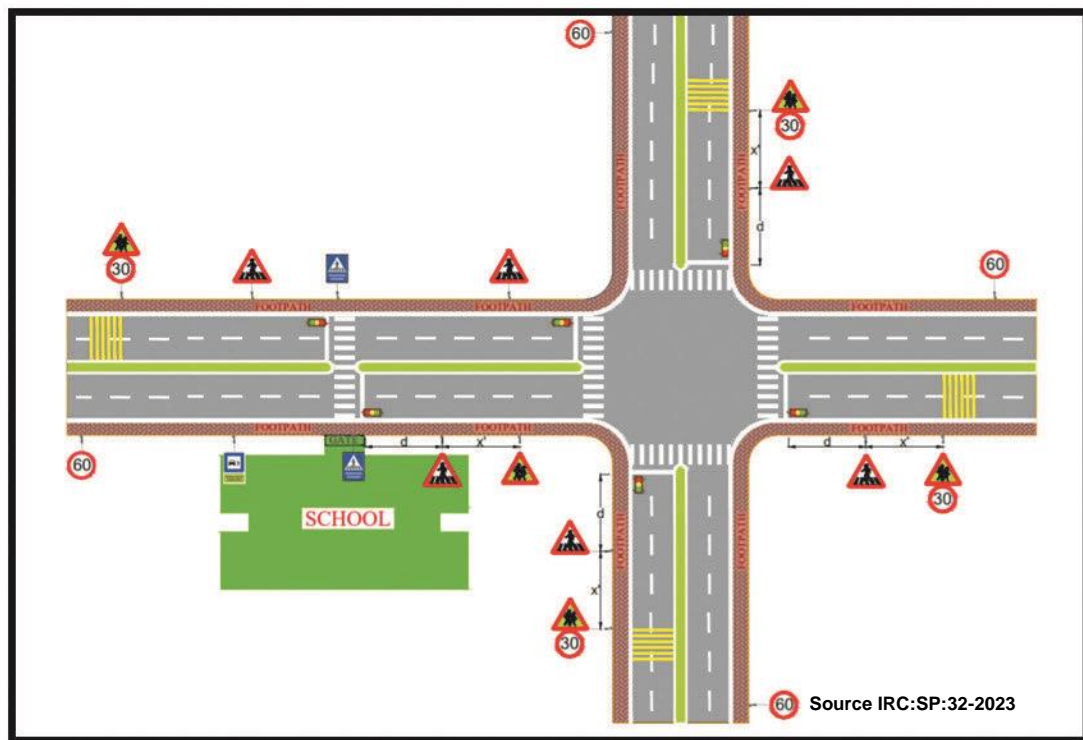
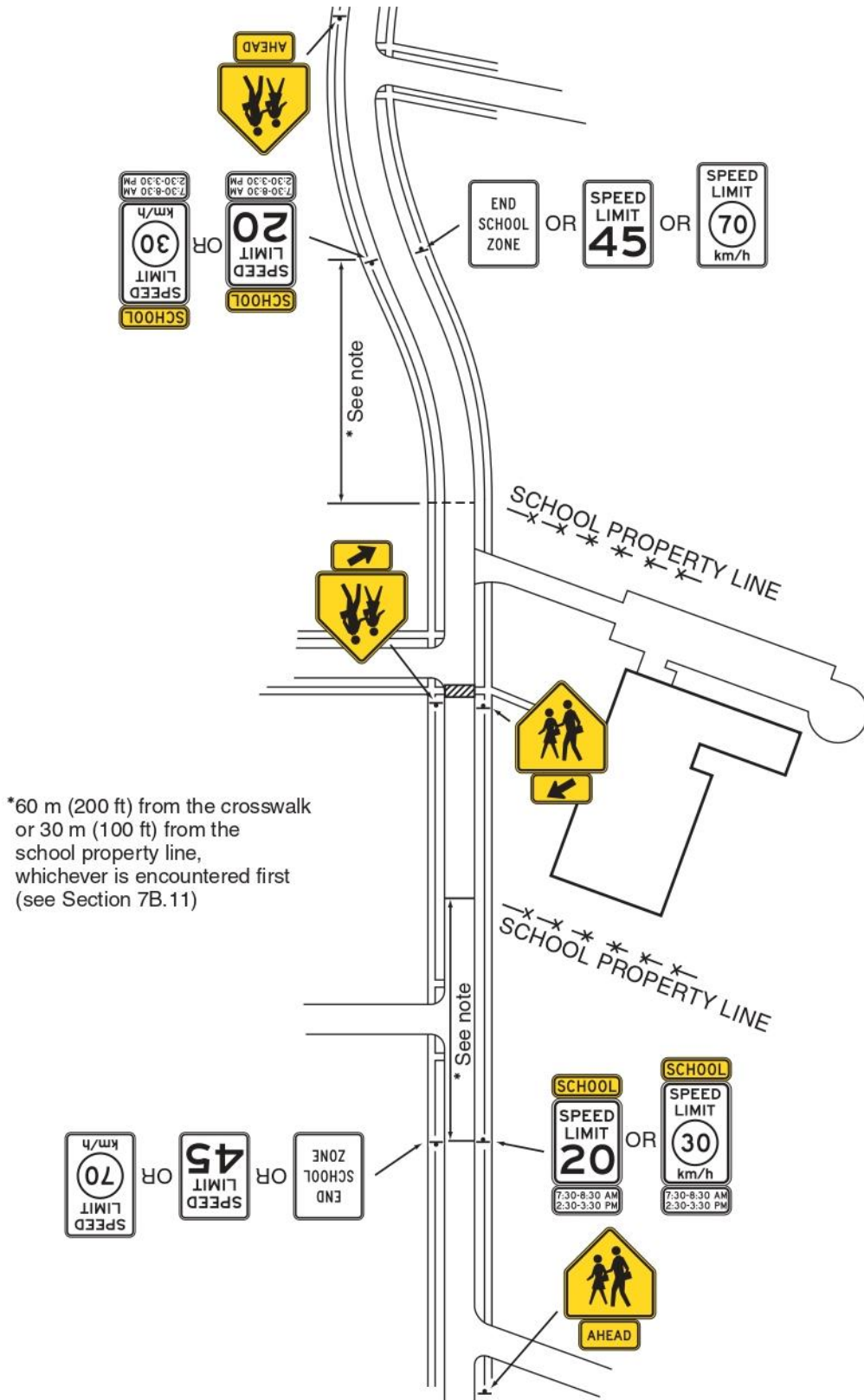


Figure 26 Typical Illustration of various measures required for the school gate located on midblock section of a four-lane divided road



Source MUTCD 11th edition, 2023

Figure 27 Typical Illustration of school signs as per MUTCD

4 School Zone Safety Audit

4.1 Demographic details of the school

Name: Shri Mhalsakant Junior College

Address: Sector No. 28, Pradhikaran, Nigdi, Pimpri – Chinchwad, Maharashtra – 411044

GPS Coordinates: 18.64855, 73.77545

Campus Type: Urban

4.2 Field Study

The school can be accessed by NDA road and three other local streets. This chapter discusses the observations of a field study done in the school zone.

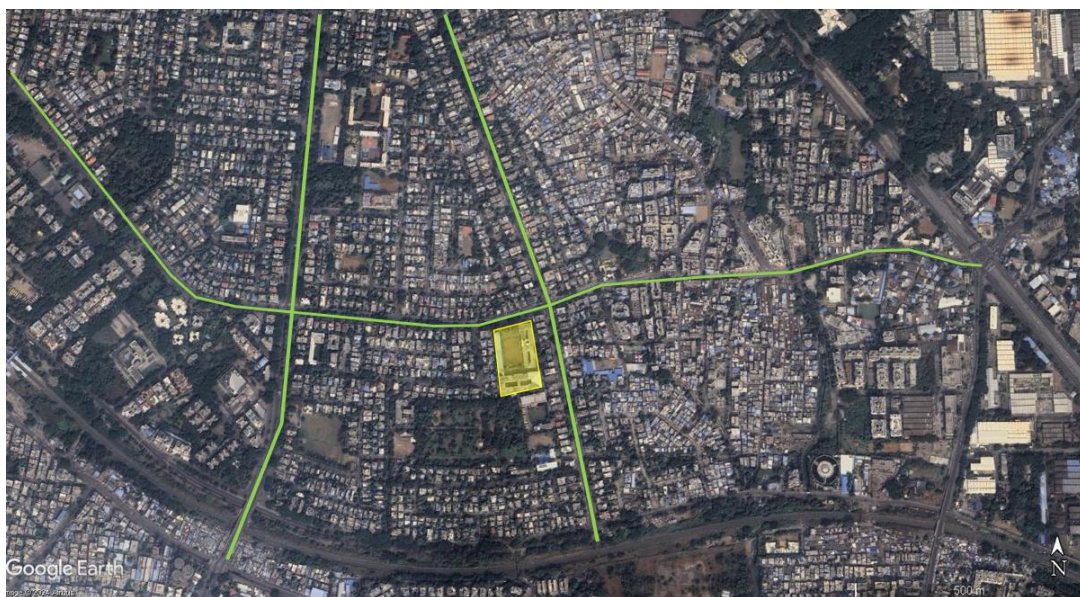


Figure 28 Study Area

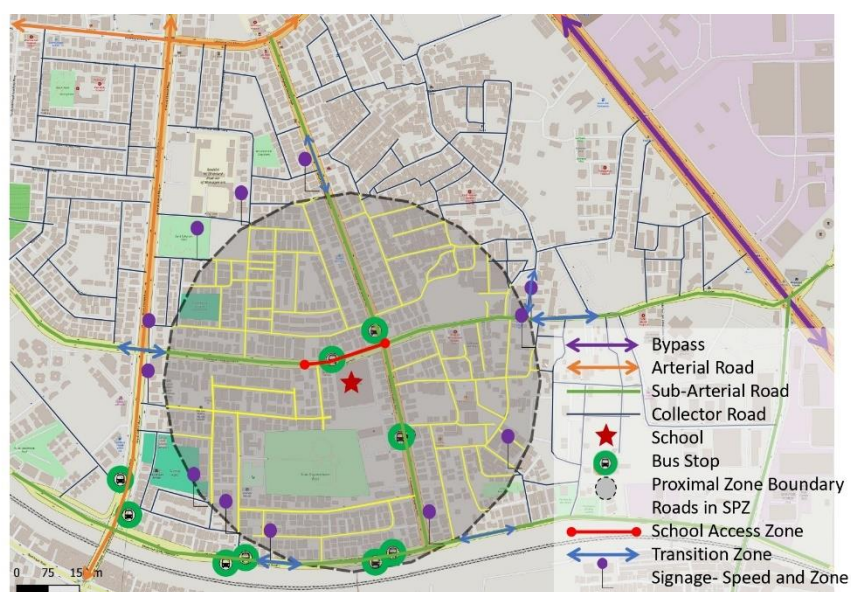


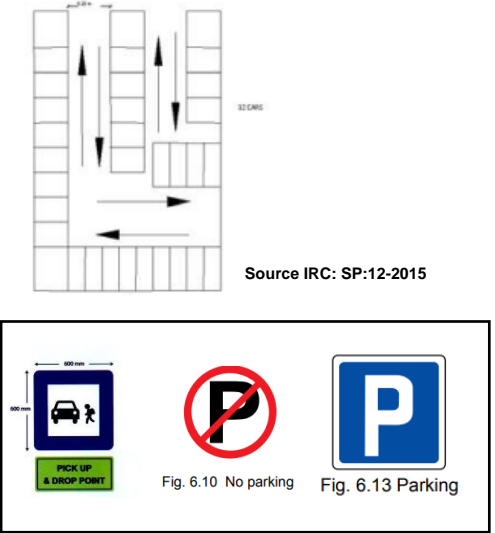

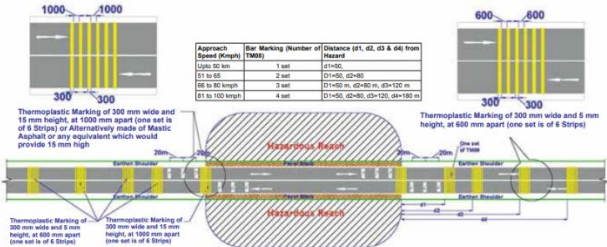






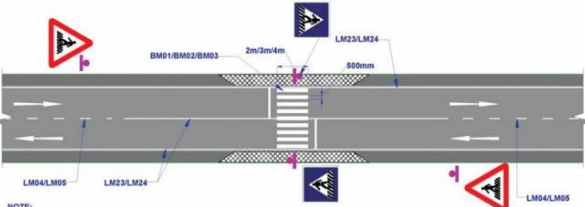
Figure 29 School Access and Proximal Zones




4.3 Safety Issues and Recommendation


No	Safety Concerns & Audit Findings	Risk	Recommendations	Priority
	Description (with Images if any)		Description (with figures if any)	
1	Parking			
1.1		Medium	<p>On-street parking should be avoided 50m before and after the entry/exit gates as per IRC 103-2022.</p> <p>Design of Pickup/Dropoff Bay using IRC SP:12 2015.</p> 	Highly desirable
			Dedicated and marked parking with roadway marking as per IRC 35-2015 should be provided as shown in the example.	Highly desirable



			 <p>Source IRC: SP:12-2015</p> <p>Source IRC: 67-2022</p>	
2	Traffic Calming Measures			
2.1	Limited traffic calming measures. 	Very High	Provide physical traffic calming on main corridor to curtail the speed such as sets of Transverse Bar Marking with road studs should be provided before crossing to reduce traffic speed. As per IRC 99:2018 Provide psychological traffic calming measures on main corridor and the last set of bar marking shall be 6 numbers of thermoplastic of 15 mm of height so as curtail the speed.	Essential

			 <table border="1" data-bbox="1332 247 1556 311"> <thead> <tr> <th>Approach Speed (kmph)</th> <th>Bar Marking (TMS)</th> <th>Number of Hazard</th> <th>Distance (D1, D2, D3 & D4 from Hazard)</th> </tr> </thead> <tbody> <tr> <td>Up to 30 km</td> <td>1 set</td> <td>1 set</td> <td>D1=10, D2=10, D3=10, D4=10</td> </tr> <tr> <td>31 to 40</td> <td>2 set</td> <td>2 set</td> <td>D1=15, D2=15, D3=15, D4=15</td> </tr> <tr> <td>41 to 50 kmph</td> <td>3 set</td> <td>3 set</td> <td>D1=20, D2=20, D3=20, D4=20</td> </tr> <tr> <td>51 to 100 kmph</td> <td>4 set</td> <td>4 set</td> <td>D1=30, D2=30, D3=30, D4=30</td> </tr> </tbody> </table> <p>Thermoplastic Marking of 300 mm wide and 15 mm height, at 1000 mm apart (one set is of 8 stripes) or Alternatively made of Mastic Asphalt or any equivalent which would provide 15 mm high</p> <p>Thermoplastic Marking of 300 mm wide and 6 mm height, at 600 mm apart (one set is of 8 stripes)</p> <p>Thermoplastic Marking of 300 mm wide and 15 mm height, at 1000 mm apart (one set is of 8 stripes)</p> <p>Thermoplastic Marking of 300 mm wide and 6 mm height, at 600 mm apart (one set is of 8 stripes)</p> <p>Source IRC 99:2019</p>	Approach Speed (kmph)	Bar Marking (TMS)	Number of Hazard	Distance (D1, D2, D3 & D4 from Hazard)	Up to 30 km	1 set	1 set	D1=10, D2=10, D3=10, D4=10	31 to 40	2 set	2 set	D1=15, D2=15, D3=15, D4=15	41 to 50 kmph	3 set	3 set	D1=20, D2=20, D3=20, D4=20	51 to 100 kmph	4 set	4 set	D1=30, D2=30, D3=30, D4=30	
Approach Speed (kmph)	Bar Marking (TMS)	Number of Hazard	Distance (D1, D2, D3 & D4 from Hazard)																					
Up to 30 km	1 set	1 set	D1=10, D2=10, D3=10, D4=10																					
31 to 40	2 set	2 set	D1=15, D2=15, D3=15, D4=15																					
41 to 50 kmph	3 set	3 set	D1=20, D2=20, D3=20, D4=20																					
51 to 100 kmph	4 set	4 set	D1=30, D2=30, D3=30, D4=30																					
<p>3</p>	<p>Pedestrian Infrastructure</p>																							
<p>3.1</p>	<p>Footpath The footpath around the entry/exit gates were narrow and encroached at some places</p> 	<p>Medium</p>	<p>Footpath of Minimum 2m width should be provided along the road as per IRC 103: 2022. The footpath should be barricaded with guard rails to prevent direct access to road.</p> 	<p>Desirable</p>																				

			 <p>Figure 5-13: Guard rails and organisation of pedestrian space (projected cycle wheels are potential accidental hazard to children/ adults with visual impairment. Walkway shall show tactile paver 600mm away from the cycle wheel)</p> <p>Source IRC: SP:32-2023</p>	
<p>3.2</p>	<p>Zebra Crossing Improperly designed pedestrian crossing without median opening leading to unsafe crossing.</p> 	<p>High</p>	<p>Provide Zebra Crossing as per IRC:35-2015. If pedestrian crossing length is more than 10.5 m in one go, there shall be Refuge Island in between of at least 1.2 m width to serve as shelter place.</p>  <p>NOTE: - In an Un-Signalled crossing, pedestrian crossing marking shall be around 5 to 3 m from stop line. - In a Signalled crossing, pedestrian Marking around 1 to 1.5 m in advance of a primary signal.</p> <p>Fig. 11.3 Pedestrian Crossing</p> <p>Source IRC:35-2015</p>	<p>Highly Desirable</p>

				
4	Cycle Track			
4.1	No cycle track or dedicated cycle lanes were found. 	Medium	For Arterial roads provide a minimum 2.2m for a two-lane cycle track and 3 m to 4 m for a common cycle track and footpath.  <small>Source IRC: SP:32-2023</small>	Desirable
5	Signs			
5.1	School Zone Warning Sign School Zone Warning Sign was found	High	The “School Ahead” sign should be provided well in advance with supplementary signs to indicate the distance of school/school zone. “Speed Limit” sign should also be provided along with “School Ahead” sign.	Highly Desirable

	<p>missing.</p> 		 <p>School Ahead with fluorescent Yellow Green Background</p> <p>Source IRC: 67-2012</p>	
5.2	<p>Speed Limit Sign Speed limit signs were not found in the school zone</p>	High	<p>School children are more prone to commit mistakes while negotiating with highway traffic. Hence, it is recommended that vehicles should travel at maximum speeds of 25 kmph near schools as per IRC:99-2018.</p>  <p>Source IRC: 67-2012</p>	Highly Desirable

<p>5.3</p>	<p>Pedestrian Crossing Sign Missing Pedestrian crossing sign.</p> 	<p>High</p>	<p>Provide pedestrian crossing warning sign and information sign.</p>  <p>Pedestrian Crossing Information Source IRC: 67-2012</p>	<p>Highly Desirable</p>
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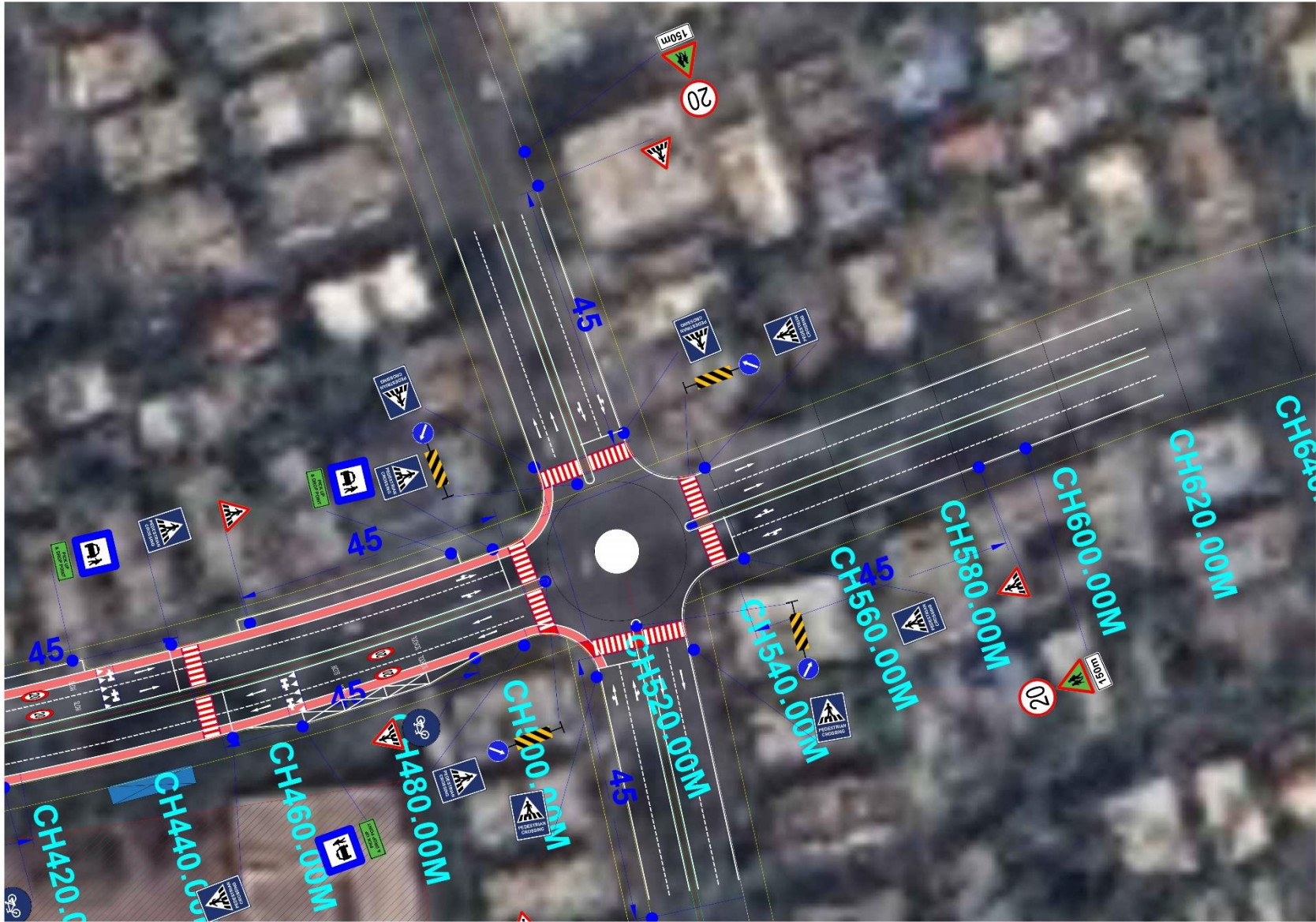
4.4 Field Study

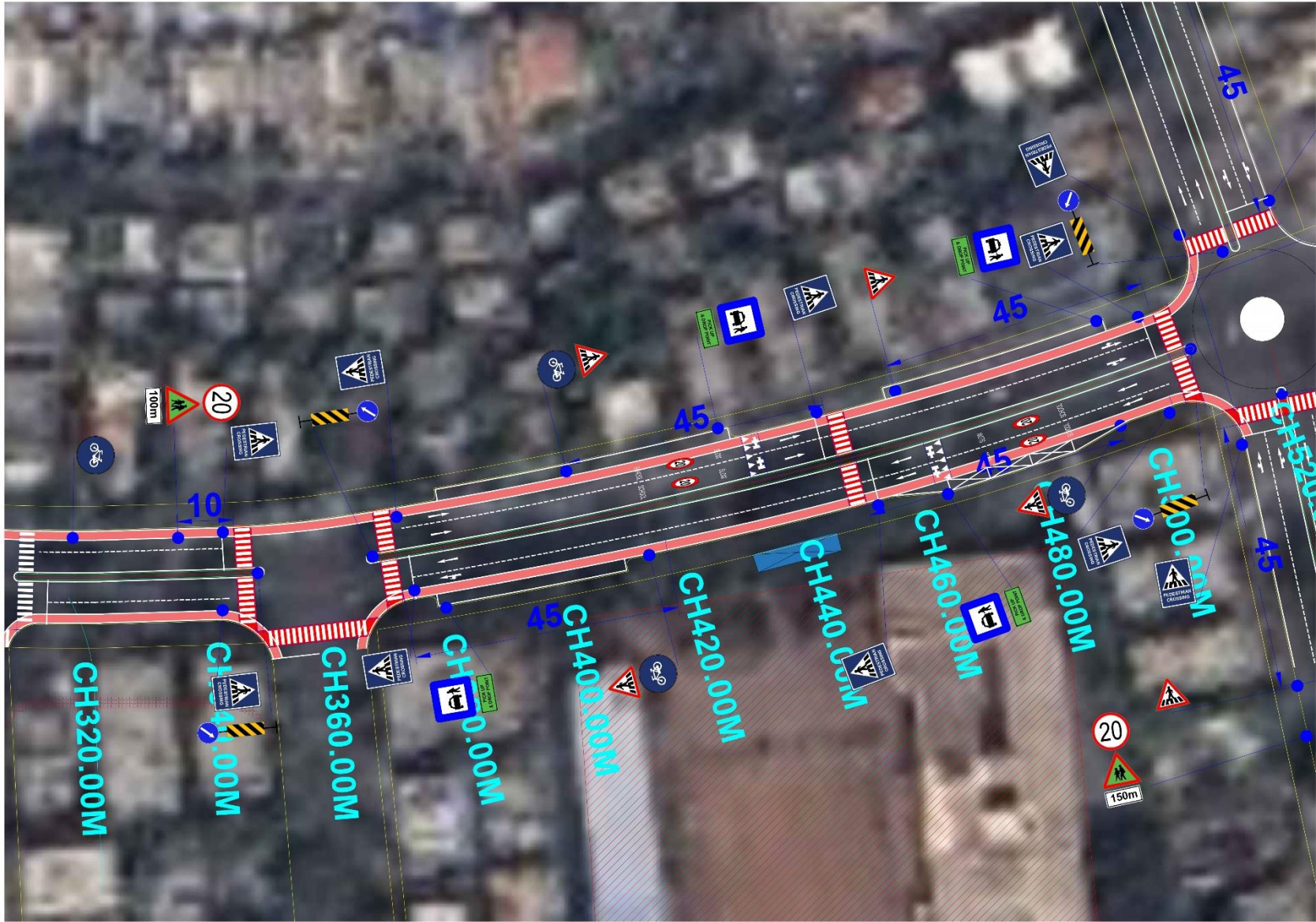


Figure 30 Views of various Road Signs and Zones (Source IRC:SP:32-2023)

4.4.1 Proposed Layout Map for Road Signage and Marking

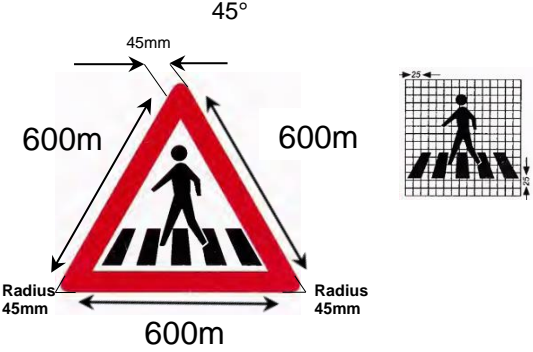
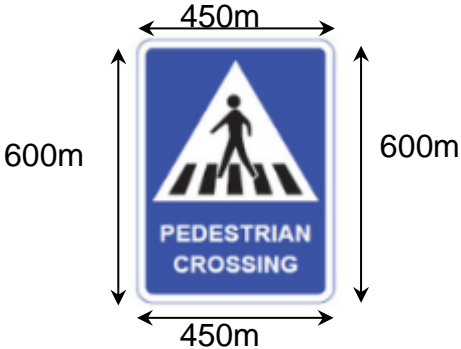
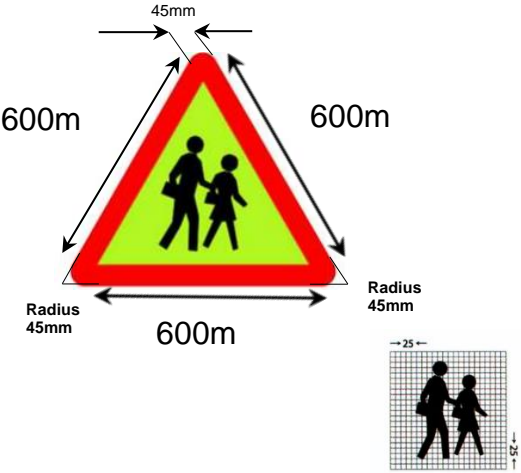
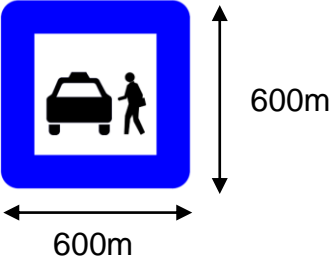


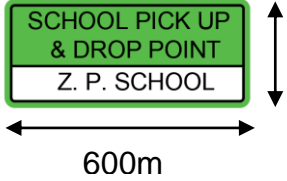
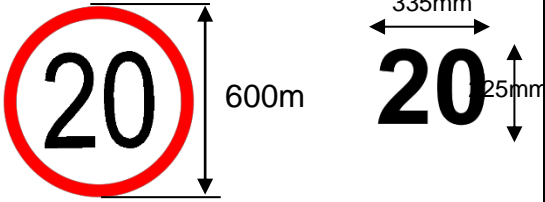
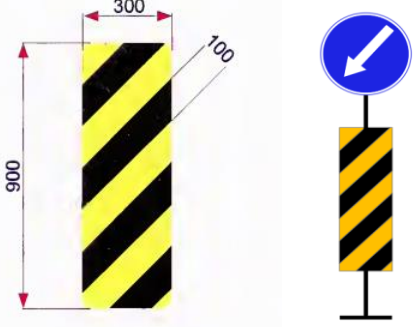
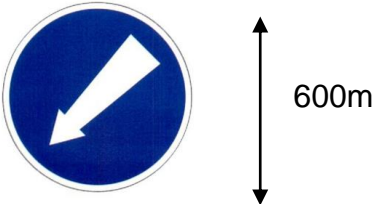
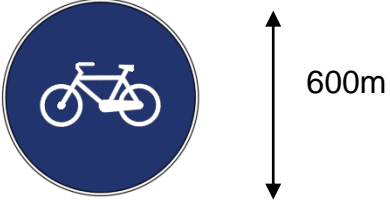


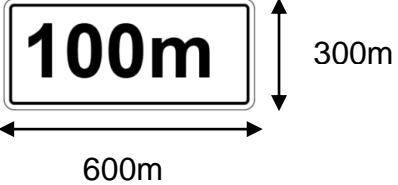
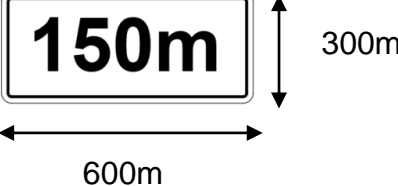




4.4.2 List of required Road Signage and Quantity

Sr. No.	Signage	Dimensions	Recommendations as per IRC	Quantity
1	Pedestrian Crossing	600mm side, 45 mm border		7
2	Pedestrian Crossing	Height 600mm, width 450mm		14
3	School Ahead	600mm side, 45 mm border		4
4	School Pickup & Drop Point	600mm side		4

5	Definition Plate			4
6	Speed Limit	600mm diameter with 45mm red border		4
7	Object hazard(right)	900mm height, 300mm width, 100mm black bands at 45°	 <p data-bbox="730 1084 1121 1117">Fig. 15.77 Object Hazard (Right)</p>	6
8	Compulsory Keep Left	600mm diameter with 25mm white border	 <p data-bbox="715 1346 962 1368">Fig. 14.50 Compulsory Keep Left</p>	6
9	Cycle Only	600mm diameter with 25mm white border		4

10	Definition Plate			1
11	Definition Plate			3

4.4.3 Quantity for Road Marking

Sr No	Description			Length	Width	Area of Marking	Quantity	Total Area
				in metre	in metre	in sq m	in numbers	in sq m
1	Lane Marking for both ways		Dotted white	315	0.15	47.25	1	47.25
2	Edge Lane Marking for both ways		Solid continuous white	2706	0.15	405.9	1	405.9
3	Stop Line Marking		Solid continuous white	7.5	0.15	1.125	38	42.75
4	Pedestrian Crossing Marking		Solid White	3.5	0.5	1.75	74	129.5
			Solid White with red Boundary	2.5	0.5	1.25	129	161.25
			Red Boundary			391	1	391
5	Arrow Marking	Straight	Solid White	3.5	0.5	1.75	14	24.5
		Right Shared	Solid White	3.5	0.5	1.75	4	7
		Left Shared	Solid White	3.5	0.5	1.75	5	8.75
		Left and Right	Solid White	3.5	0.5	1.75	0	0
6	SLOW Marking			1.6	1.2	1.92	4	7.68
7	SCHOOL Marking			1.6	2.2	3.52	4	14.08
8	Speed Limit Marking			4.7	1.6	7.52	4	30.08
9	Pick Up Drop Off			227	0.15	34.05	1	34.05
10	Transverse Bar Marking		Solid Yellow	9.5	0.6	5.7	2	11.4
11	Cycle Track			300	1.5	450	2	900
	TOTAL							1316

5 Project Highlights



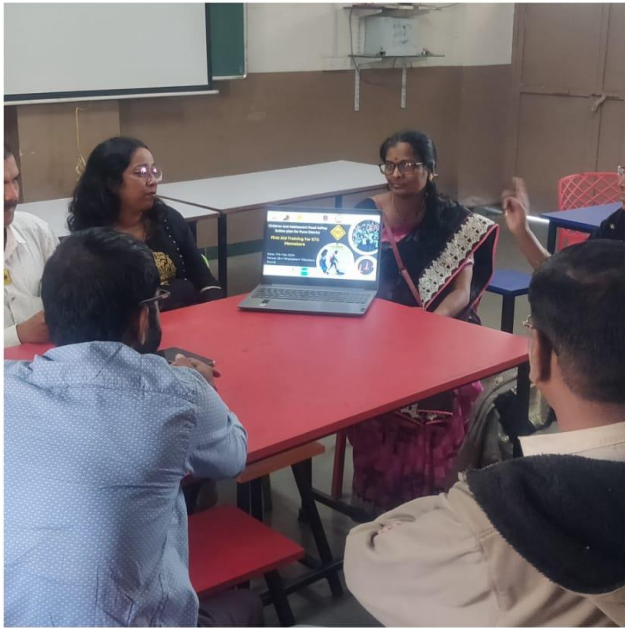


Figure 31 Meeting with Stakeholders