

An Assessment of Road Markings, Signs and Signals around Schools in Amritsar City

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Abstract

Given that children formulate a large and crucial part of this growing population in cities, it becomes relevant to look at their needs in a holistic manner through urban planning and design. To advocate child-friendly practices it is imperative to look at issues such as appropriate safety standards, guidelines on the quality of the built and spatial environment, children's participation in decision making, allocation of special children's budgets and convergence of various city agencies. Their maximum mobility is involved between the routes of their home and the schools. It is imperative to work towards these corridors. The minimal intervention can be done by improving the road markings, signs and signages. Hence, Amritsar city has been opted from the 20 cities under the Smart City Mission. It has a population of 116,383 children under the age of 6 years and around 25% of the population is under 15 years. The aim of this paper is to analyze the gap between the typological framework and the diverse set of situations and challenges that Amritsar might face in the context of child movement and mobility around the educational institutions under the considerations of traffic markings, signs and signage's.

Keywords: Road signs, Road Signage's, Road markings, Schools

1. Introduction

The multiple stakeholders in the planning process going through a series of hierarchical structure, the basic unit of the system is often forgotten i.e. children especially their freedom of movement with a safe space infrastructure [1]. The planning of the cities are more inclined towards the productive population and towards making the urban livability more convenient. The planning of the cities are done on the premise that they are exist primarily for economic purposes.[2] The continuous process of architectural and planning ideology has led to the creation of fragmented and chaotic cities where the social factor of independence for the age groups other than the productive age is not given due importance. Road surface markings are used to convey important information on the roads for the smooth flow of vehicular and pedestrian movement with the help of certain devices, materials and signs. They can be on the carriageway as well as on the kerb comprising of lines, patterns, words and other such devices to guide, control and warn all the road users. Traffic signs give information about the road conditions ahead, provide instructions to be followed at the major crossroads or junctions, warn or guide drivers, and ensure proper functioning of road traffic. Road signage's are a detailed system of giving information, regulating the traffic and warn for the dangers with the help of graphical and symbolism measures. Road signals are used for the control of conflicting streams of vehicular and pedestrian traffic and is used extensively in most cities. Traffic control signals are devices placed along, beside, or above a roadway to

guide, warn, and regulate the flow of traffic with the help of light signals, which includes all the road users.

2. Need

India has a total population of 472 million children till the age of 18 years which constitutes as 39 per cent of the country's total population. As many as 128.5 million Indian children reside in urban areas. Children constitute 34 per cent of the urban population, and it becomes imperative that we include and address the needs of children in planning and building sustainable cities[3][4]. 24.5% of the population of Punjab is under the age of 15 years which utilises the facilities of the schools and lower level educational institutions. Around a quarter of the population of Amritsar City is under the age of 15 years whose regular trips involves one destination as an educational institution. 25.4% of the total population are children going to the school [5]. The Master Plans focuses on different aspects of the planning and deals with them broadly on the outside. The consideration of children for their activity zones are not done and they are left behind. The regulations of the school infrastructure are formed but the mobility of the children are not in compliance with the mobility of the city. The aim of urban development addresses the issue of increasing need of vehicular movement but it does not devise plans to make walking safe institutions. An extensively intricate study of the Amritsar City is done for the detailed information on its road signs, signals and markings. The schools are bifurcated according to their level of education for both of them have different requirements because of the age classification of the students. The schools are either primary or secondary schools and they have been spatially selected based on various predefined parameters.

3. Safe School Vahan Scheme

The Punjab and Haryana High Court directed the "Safe School Vahan Scheme" in 2013 to ensure the safe transportation of the students from their homes to the schools and back. It has been implemented on the state and the district levels. It ensures the formulation of a school zone earmarked prominently with the help of traffic signs, markings and zebra crossings. Pelican signals should be installed in the in front of the school wherever required at the school opening and departure hours to facilitate the safe crossing of children. The maximum speed limit outside the school should be 10kmph which will be regulated with the help of speed breakers and traffic islands. The sizes and the types of symbols of school names have also been specified in the policy itself.[6]

4. Assessment of Road Markings, Signs and Signals

For the purpose of the study, six schools were selected out of which three were the primary schools while the other three were secondary schools. They have also been selected on the basis of access roads, spatial zones, type of planning of an area, and the ownership of the institutions.

4.1 Primary Schools

The primary schools are the institutions till the classes of V standard with the age of children till 9 years. They are essentially dependent on their guardians and the school authorities for their activities and the movement. They are the most vulnerable age group because of their initial start on the outside infrastructure independently. For the purpose of the study, three schools have been chosen from different areas with varied infrastructure conditions.

4.1.1 Holy Heart Presidency School

Holy Heart Presidency School is located on the Railway Road near the Railway Station. This school has children from the age of 4 to 9 years. The total strength of the school is 650 students.

Table 1: Road Markings of Railway Road

Road Markings	Presence	Condition
Edge Lines	Yes	Faded
Pedestrian Crossing	Yes	Defined
Stop Line	Yes	Faded
Centre Line	Yes	Defined
Arrow Markings	No	-
Kerb Markings	Yes	Defined

Source:Primary Survey

Most of the road markings i.e. the carriageway markings and the kerb markings are present on the access road of the Railway Road. The condition of the road markings are mostly defined with the exception of the Stop Line and the Edge Lines which are in a faded condition. The list of road markings, their presence and condition are present in the table 1.

Table 2: Road Signs of railway Road

Road Signs	Presence	Placement
Speed Limit	No	-
Parking	No	-
Give Way	No	-
BRTS Sign	Yes	Median
Stop	No	-
Pedestrian Crossing	No	-
School	No	-

Source: Primary Survey

The road signs of school, speed limit and the pedestrian crossing are missing which are essential for the safe transport of children. The school sign ensures that the driver is aware of the upcoming situation on the road. Only the BRTS Sign is present at the median at the intersection of the railway road. The condition of the sign is not good and is broken serving no purpose. The sign of the pedestrian crossing is needed because of the presence of the bus stop at the median which attracts people from the railway station. The presence and the placement of the road signs are described in the table 2.

Table 3: Road Signals at Railway Road

Road Signals	Presence	Placement
Traffic lights	Yes	Intersection
Traffic blinker	No	-
Pedestrian lights	Yes	Intersection

Source: Primary Survey

The road signals are present at the intersection with the traffic lights and pedestrian blinkers are present on the sides. The blinkers are used for the safe crossing of the pedestrian towards the opposite side of the lane but in this access road, they do not function and are broken. The presence and the placement of the Road Signals are shown in table 3.

4.1.2 Senior Study School 1

Table 4: Road Markings for Cantt. Road

Road Markings	Presence	Condition
Edge Lines	Yes	Defined
Pedestrian Crossing	No	-
Stop Line	No	-
Centre Line	No	-
Arrow Markings	No	-
Intersection Crossing	Yes	Defined

Source: Primary Survey

Since the road is not a major road, it has many markings missing in the road. The kerb markings are present for the footpath on the side. The centre lines are not marked but the edge lines are well defined. There are no pedestrian crossings which are essential for the internal lane of the school. The intersection markings are present at the roundabout along the main stretch of the road as shown in table 4.

Table 5: Road Signs of Cantt. Road

Road Signs	Presence	Placement
Speed Limit	No	-
Parking	No	-
Give Way	No	-
Stop	No	-
School	No	-
Pedestrian Crossing	No	-

Source: Primary Survey

As shown in the table 5 no road signs are present along the entire access lane of the road either in the main road or the inner road. School signs are not present which are important to signify the incoming traffic situation and caution the drivers of low speed. There are no speed limit signs on the road but the speed breakers are present at considerable distance to regulate the speed.

There is no annotation of the school’s name which makes it difficult for recognize amongst the residential facades as it also has the same façade type of the residential buildings and makes it a homogeneous part of the street.

4.1.3 Ryan International School Junior

Ryan International School Junior is located on the service lane of the main GT Road. It is a private school which has total strength of 300 students from the age of 3 to 7 years.

Table 6: Road markings at GT Road

Road Markings	Service Lane		Carriageway	
	Presence	Condition	Presence	Condition
Edge Lines	No	-	Yes	Defined
Pedestrian Crossing	No	-	No	-
Stop Line	No	-	No	-
Centre Line	No	-	No	-
Arrow Markings	No	-	No	-
Kerb Markings	No	-	No	-

Source: Primary Survey

There are no longitudinal and horizontal markings present in the service lane. They are essential for the easy directions of the vehicles. Though edge markings are present in the main carriageway and they are well defined. No centre lines and kerb markings are seen on it and they are described in table 6.

Table 7: Road Signs at GT Road

Road Signs	Service Lane		Carriageway	
	Presence	Placement	Presence	Placement
Speed Limit	No	-	No	-
Parking	No	-	No	-
Give Way	No	-	No	-

BRTS Sign	No	-	Yes	Corridor
Stop	No	-	No	-
Pedestrian Crossing	No	-	No	-
School	No	-	No	-

Source: Primary Survey

No road signs are provided for the school and the speed limit either in the carriageway or the service lane. Only the BRTS sign is present at the corridor at the bus stop as shown in table 7. Nor any sign is provided for the turn to the service lane. Signs help in warning the drivers of the upcoming hazards and preparing the traffic for it.

Table 8: Road Signals at GT Road

Road Signals	Presence	Placement
Traffic lights	Yes	Intersection
Traffic blinker	No	-
Pedestrian lights	No	-

Source: Primary Survey

The traffic signals are present at the intersection where the carriageway diverges into the service lane as mentioned in table 8. The amber flashlights for the BRTS signal are not present.

4.2 Secondary Schools

The secondary schools are defined as the institutions till the class of XII standards where the age of the children range between the ages of 3-18 years. For the purpose of the study, three secondary schools have been selected according to the predefined parameters.

4.2.1 Sacred Heart Senior Secondary School

Sacred Heart Senior Secondary School is located at Majitha Road among the public buildings. It is a privately owned school with the school strength of around 2000 students.

Table 9: Road Markings at Majitha Road

Road Markings	Presence	Condition
Edge Lines	Yes	Defined
Pedestrian Crossing	No	-
Stop Line	No	-
Centre Line	Yes	Faded
Arrow Markings	No	-
Kerb Markings	Yes	Defined

Source: Primary Survey

The carriageway and the kerb markings are present on the road and they are well defined. The edge lines and the centre lines are present in the carriageway and the kerb markings are marked at the median as show in table 9. They do not have any pedestrian crossings which is

essential for the students as there is an opening divider in front of the school gate. the centre lines present at the carriageway are rugged and faded.

Table 10: Road Signs for Majitha Road

Road Signs	Presence	Placement
Speed Limit	No	-
Parking	No	-
Give Way	Yes	Shoulder
BRTS Sign	No	-
Stop	No	-
Pedestrian Crossing	No	-
School	Yes	Median

Source: Primary Survey

Road Signs are informative and cautionary in character. At the median two school signs have been installed to the upcoming road for the school at 20m distance as shown in Figure 1. One sign is in a bad condition and is not legible while the other is clear and identifiable. A give way sign is also installed in the shoulder but no speed limit or

Figure 1: Road Signs at Majitha Road



Source: Primary Survey

any other sign is present at the site as shown in table 10.

Table 11: Road Signals at Majitha Road

Road Signals	Presence	Placement
Traffic lights	Yes	Intersection
Traffic blinker	No	-
Pedestrian lights	No	-

Source: Primary Survey

The road signals are present at the intersection which has a small roundabout. They help in regulating the upcoming traffic to the school. No pedestrian blinkers are present at the road signals as shown in table 11 which makes it hazardous for the people on foot to cross the road.

4.2.2 Govt. Girls Sen. Sec. School

The Govt. Girls Sen. Sec. School is located on the Mall Road across the Taylor Road. It is a government school with a total strength of 780 students.

Table 12: Road Markings for Mall Road

Road Markings	Presence	Condition
Edge Lines	Yes	Faded
Pedestrian Crossing	Yes	Faded
Stop Line	Yes	Faded

Centre Line	Yes	Defined
Arrow Markings	No	-
Intersection Crossing	Yes	Defined

Source: Primary Survey

The carriageway markings of stop line, pedestrian crossings, edge lines and the centre lines are present in the road but most of them are faded. Only the intersection crossings and the edge lines are well defined. Though the arrow markings are not present as shown in table 12.

Table 13: Road signs at Mall Road

Road Signs	Presence	Placement
Speed Limit	No	-
Parking	Yes	Shoulder
Give Way	Yes	Shoulder
BRTS Sign	Yes	BRTS Railing
Stop	No	-
School	No	-
Pedestrian Crossing	No	-

Source: Primary Survey

The pedestrian crossing signs, speed limits and the school signs are not present on the access road. The parking sign are present on the shoulder outside the school along with the give way sign. The BRTS sign is present at the corridor of the buses at the intersection. The road signs on the access roads and their placement is shown in table 13.

Table 14: Road Signals at Mall Road

Road Signals	Presence	Placement
Traffic lights	Yes	Shoulder
Traffic blinker	Yes	Shoulder
Pedestrian lights	Yes	Shoulder

Source:Primary Survey

The road signal of the three lights are present at both the ends of the stretch and at the intersection of the Taylor Road. Outside the school, flashing amber signal has been installed which means the traffic has to be more aware because of the upcoming school. The pedestrian signals are also installed at the intersection along with the markings for easy movement of the pedestrians as shown in table 14.

4.2.3 Arun Rashmi Sainik School

Arun Rashmi Sainik School is located at BK Dutt Road inside the walled city near the Lohgarh Gate. The school is branched out at two buildings on the same road in terms of the advancement of the classes and the strength of 900 students is divided into two buildings. It is a secondary school and is owned by a private organisation.

Table 15:Road Markings at BK Dutt Road

Road Markings	Presence	Condition
Edge Lines	No	-
Pedestrian Crossing	No	-
Stop Line	No	-
Centre Line	No	-
Arrow Markings	No	-
Kerb Markings	No	-

Source:Primary Survey

The roads are very narrow and does not have any road markings including the edge markings and the stop lines as shown in table 15. Since it is a two way lane, the centre lines are important but they are not present on the road.

Table 16:Road Markings at BK Dutt Road

Road Signs	Presence	Placement
Speed Limit	No	-
Parking	No	-
Give Way	No	-
Stop	No	-
Pedestrian Crossing	No	-
School	No	-

Source:Primary Survey

No road signs are present at the access road. The school signs and the stop signs are not present along the whole stretch of the road as shown in the table 16.

5. Findings

In the above mentioned studies, the traffic signs and signages of the schools do not correlate with the requirements in the Safe School Vahan Scheme. The Holy Heart Presidency School has an access on the main traffic road without any pelical signals and safe crossing mechanism. In case of the primary schools, only Senior Study School 1 has a speed breaker outsider the school road. The Sacred Heart Senior Secondary School has a speed breaker just outside the main gate which instead of ensuring safe crossing also increases the risk of traffic congestion, thereby accelerating the rate of accident risk. The other two does not have anything in relation to this policy. As per the statement by Lovejit Kalsi, Amritsar district transport officer (DTO), “We have impounded almost a 100 school buses in the past one year in Amritsar under the scheme besides issuing challans. Inspecting school buses is an ongoing process and we are checking several vehicles every day”. It shows the maximization of risk in the school buses for the children and their routes from their houses to their workplaces.

6. Conclusion

The regulation of road markings, signs and signals is a lost cause in the entire conundrum of the safety of children. The district authorities shrug it off as a miniscule attempt in the

welfare of the risk assessment in the vehicular and pedestrian traffic. The primary schools need to be more cautious of all the markings and the adherence of the schemes while they are the most negligent of the schemes and cautions. On the other hand, the secondary schools, instead of having their in house mechanisms to combat the risks of the children add to the problem by creating traffic congestion. There is a need to sensitize the private and the district authorities in steering their direction towards the safety of school children. The expenditure on the devices and the infrastructure can be minimized by skillfully placing the road signs, signals and markings.

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