Indore Walkability Study

Indore, India

Prepared By

EMBARQ

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1. Introduction

CAI Asia is conducting walkability survey for asian cities and Indore is one of the city from India. EMBARQ has been appointed for conducting this study for CAI Asia.

”Walkability” is a term used to describe and measure the connectivity and quality of walkways, footpaths, or sidewalks in cities. It can be measured through a omprehensive assessment of available infrastructure for pedestrians and studies linking demand and supply.

Some cities that have undertaken comprehensive studies and city plans for improving walkability like the Transport for London (2004), defines walkability as “the extent to which walking is readily available to the consumer as a safe, connected, accessible and pleasant activity.” For New Zealand, it was defined as the extent to which the built environment is walking friendly. Other cities, particularly in Europe, have developed plans and supporting policies specifically to improve the walkability and cyclability of the whole city.

In India, a walkability index was used in one of the studies commissioned by the Ministry of Urban Development (MOUD). The index was a function of the availability of footpaths and pedestrian facility rating. This study indexed 30 cities of all sizes on walkability and assessed them based on the availability of footpaths on major arterial roads, and overall facility rating by pedestrians themselves. The perception of pedestrians was gauged on the availability and quality of footpaths, obstruction, maintenance, lighting, security from crime, safety in crossings, and other qualitative factors. A low rank indicates inadequate and substandard pedestrian facilities. The national average index in 2008 was 0.52. In addition, the MOUD also developed an urban transport benchmarking tool that uses three indicators to calculate the pedestrian facility rating - signalized intersection delay(s)/pedestrian, street lighting (Lux) and % of city covered with footpaths wider than 1.2 m.

A popular website, “Walk Score” calculates the walkability based on the distance from your house to nearby amenities. Walk Score measures how easy it is to live a car-free lifestyle, but it does not include an assessment of the quality of pedestrian facilities like street width and block length, street design, safety from crime and crashes, pedestrian-friendly community design, and topography. Many Asian cities can have high scores in Walk Score because of the traditionally mixed-use character of the cities.

The Global Walkability Index developed by H. Krambeck for the World Bank provided a qualitative analysis of the walking conditions including safety, security, and convenience of the pedestrian environment. This analysis provides a better understanding of the current situation of the walkability of Asian cities and is able to identify factors for improving pedestrian facilities. The location of walkabliity survey for Indore is shown in following figure;

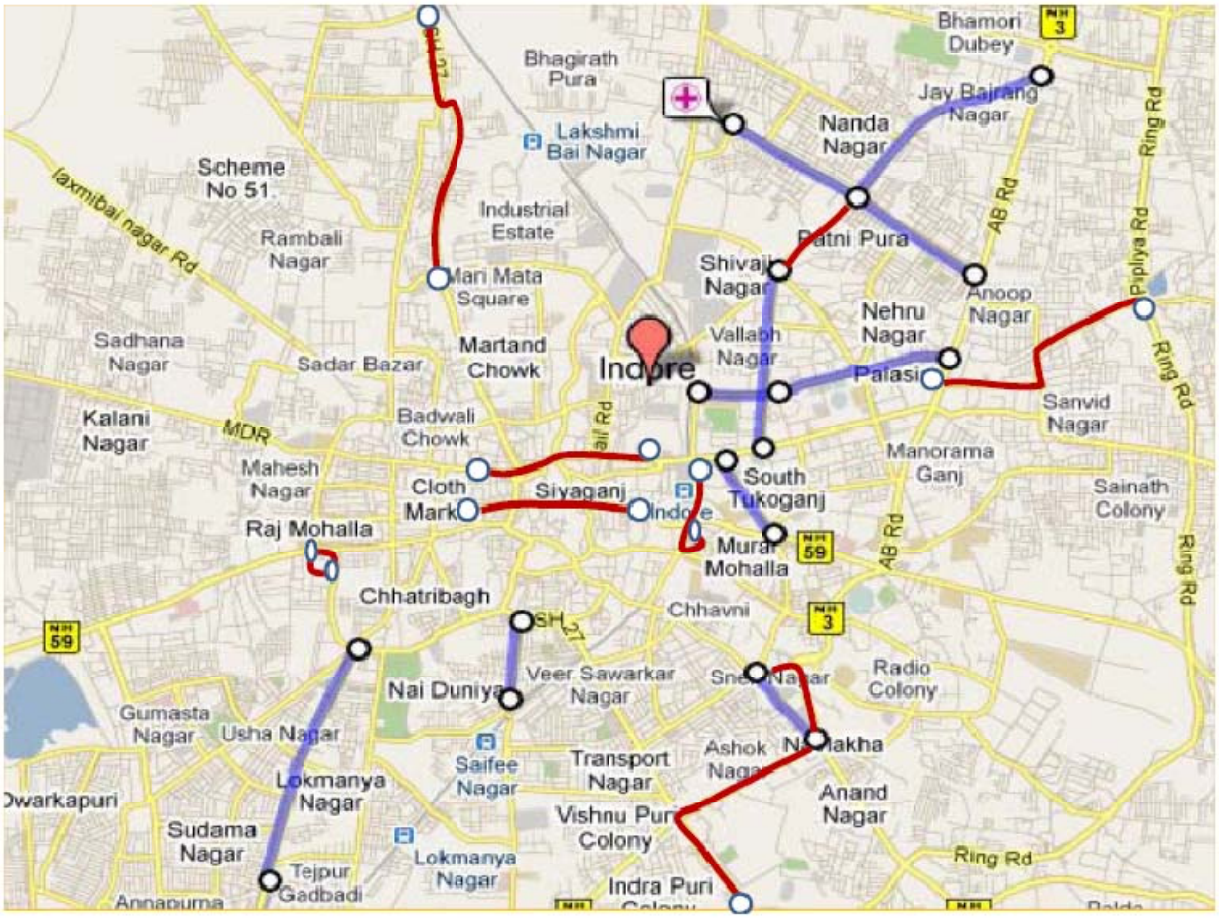

Figure 1. Walkability survey location

2. Methodology

This section describes the methodology of the surveys conducted in Indore, with detailed location map showing various locations of surveys. The survey used a methodology based on the Global Walkability Index developed by the World Bank, which includes a field walkability survey, pedestrian preference survey and a government policy and institutional survey.

2.1 Field Walkability Survey

In order to provide a holistic approach which links design and execution with user perception and the built environment, the CAI-Asia Center slightly modified the GWI methodology to accommodate complete route assessments and included a pedestrian interview survey to capture the responses and preferences of pedestrians for this study.

For Indore city, field walkability surveys were carried out in residential, educational, and commercial areas and around public transport terminals. Areas with high pedestrian volume were surveyed based on reconnaissance surveys and/or in consultation with stakeholders. Complete route assessments were conducted by following the logical pedestrian routes in the specific areas.

The areas were surveyed using the parameters used in the Global Walkability Index with slight modifications in the description to make this more applicable to the Asian context as shown in Table 1

Table 1. Field Walkability Survey Parameters

Parameter	Description
1. Walking Path Modal Conflict	The extent of conflict between pedestrians and other modes, such as bicycles, motorcycles and cars on the road
2. Availability of Walking Paths	This parameter is added to the original Global Walkability Index (combined with the original parameter "Maintenance and Cleanliness") . It reflects the need, availability and condition of walking paths.
3. Availability of Crossings	The availability and distances of crossings to describe whether pedestrians tend to jaywalk when there are no crossings or when crossings are too far in between
4. Grade Crossing Safety	The exposure to other modes while crossing, the time spent waiting and crossing the street and the sufficiency of time given to pedestrians to cross signalized intersections
5. Motorist Behavior	The behavior of motorists towards pedestrians which may well indicate the kind of pedestrian environment there is in that area.
6. Amenities	The availability of pedestrian amenities, such as benches, street lights, public toilets, and trees greatly enhance the attractiveness and convenience of the pedestrian environment, and in turn, the city itself.
7. Disability Infrastructure	The availability of, positioning of, and maintenance of infrastructure for the disabled
8. Obstructions	The presence of permanent and temporary obstructions on the pedestrian pathways. These ultimately affect the effective width of the pedestrian pathway and may result to inconvenience to pedestrians.
9. Security from Crime	The general feeling of security against crime on a certain stretch of road

Field surveyors rated the road stretches from 1 to 5 for each of the parameter (1 being the lowest, 5 being the highest) in each of the area types. The averages for each of the parameters were translated into a rating system from 0 (lowest score) to 100 (highest score). Walkability ratings in the different area types in each city were derived by taking the average of the individual parameters averages. The final city walkability ratings were derived by averaging the walkability ratings in the different area types in each city.

This method of deriving a "Walkability Rating" differs from the Global Walkability Index as the latter takes into account the number of people walking (pedestrian count) during the time of the survey and the length of the stretch being surveyed. This study excludes these two factors to eliminate the inherent bias generated by the number of people walking on a certain stretch and its length. For example a highly utilized "not-so-good" stretch should not receive a higher rating than a moderately used, high-quality stretch. Utilization per se should not be used as a parameter in assessing the walkability of a certain area because it penalizes good areas with lower utilization rates. This argument also holds true for distance. A "not-so-long", but high quality stretch of footpath should not be penalized because it is shorter. The lengths of surveyed roads/streets were documented and pedestrian counts conducted, but not used in deriving the walkability ratings.

2.2 Pedestrian Interview Survey

A short questionnaire that captures the travel and social characteristics as well as the preferences of the respondents was prepared. The questionnaire was filled out by a surveyor while interviewing pedestrians. However, there were some cases where it was difficult to stop pedestrians for an interview. In these cases, other people in the area, such as pedestrians waiting for a ride were interviewed.

Both the field walkability survey and the pedestrian interview survey were conducted during AM (i.e from 8 to 10) and PM (i.e from 3 to 5) peak-hour to capture pedestrian movement.

2.3 Stakeholder Interview Survey

This survey aims to capture responses of national and/or local government agencies that are responsible for providing, improving and monitoring pedestrian facilities. In addition to this we also inquired about existing situation, future plans, and barriers coming in the way of improving pedestrian facilities. Additional information related to pedestrian and walkability from respondent will be valuable.

3. Study findings

3.1 Pedestrian Interviews

About 300 people were intervened in the different part of the city. The main findings are as follow.

Profile and travel behavior

- 66% of respondents said that their households had a two-wheeler.
- About 80% of one way trips lie within 15-60 minutes.
- About 31% of trips lies within 3-6 km, and 24% within 6-9kms.

Respondent rating of pedestrian facilities

- About 56% consider walkability in the city is worst , 29% consider it is bad while 15% consider it is okay.
- About 57% of the respondent consider that they are most exposed to the air pollution.

Preference of Respondents

- Respondents top priority is to provide “Wider, level and clean sidewalks/footpath” followed by “removal of obstacles/parking from footpath and least priority was for “improvement of disabilities infrastructure”.
- About 50% prefer subway for crossings and 42% skywalks.
- About 37% of pedestrians can walk upto 200m for crossing.

3.2 Field Survey

The field survey has been carried out in the different parts of the city based on the type of landuse residential, educational, transport terminal and industrial. Total 13 main roads has been covered with a combined length of 27km. The survey was conducted during the peak-hour of traffic. The main finding of the survey has been given below.

- The walkability index of the Indore city is coming out to be 41.8.
- Racecourse road has high walkability index of 66.67 as the quality of infrastructure is better than other areas.
- The availability of sidewalks and if they are available then there is permanent or temporary encroachment and its access to disabled people is the biggest barrier in improving walkability. Also the availability of proper crossing is the other concern. It comes out during the survey that there are few crossing available in the city and is not considered safe.
- There were no observed consistency in design (width, height, continuity) of footpath and road crossing.

Walkaility Index score for Indore and other surveyed areas.

Scoring of Streets

Category	Khajrana-Palasiya	Navlakha to Asarambapu Sqr.	Railway St. - Sarvate Bus Stand	Khajuri Bazaar to Gandhi Hall	Cloth Market Sqr. To Patel Bridge	HIG	Racecourse Rd. GS to Mahidpurwala	Navlakha Bus Stand Agrasen Statue	Navlakha Bus Stand AB Rd.	Annapurna Road	Marimata Chw.	Gangwal Bus Stand	RNT Marg from Gandhi Statue to Nehru Statue	Manik Bagh Rd.	YN Rd. City Center to Malwa Mill Square	Malwa Mill Square to Patnipura	Patnipura to Rasoma Lab
Walking Path Modal Conflict	2	2	1	2	1	3	4	3	3	3	1	1	3	4	3	1	2
Availability Of Walking Paths	1	2	1	1	2	4	4	2	3	3	1	1	2	3	3	1	2
Availability Of Crossings	1	1	1	1	1	3	3	2	3	3	1	2	2	2	3	1	2
Grade Crossing Safety	2	1	1	1	1	3	4	2	3	2	2	1	2	2	3	1	2
Motorist Behavior	2	2	1	1	1	3	3	1	3	3	2	2	3	2	2	2	3
Amenities	2	1	1	1	1	3	3	2	2	3	2	1	3	3	3	1	3
Disability Infrastructure	1	1	1	1	1	2	2	1	2	2	1	1	2	2	2	1	2
Obstructions	2	2	2	2	2	2	3	2	2	2	1	2	2	3	2	2	2
Security from Crime	3	2	2	2	2	3	4	2	2	4	2	2	3	3	3	2	2
Pedestrian count	30	40	50	65	72	30	25	35	42	25	37	48	43	25	37	45	52
Length of Surveyed Stretch (km)	2	4.1	0.9	1.6	1.5	2.3	2	0.6	0.9	2	2.5	0.7	0.75	0.8	1.5	1	1.8

EMBARQ

Khajrana-Palasiya

1. No walkway at the section, available space can be used for better maneuver of pedestrians by constructing new walkway.
2. No facilities for crossing, speed humps at the crossing and zebra crossing can improve the safety for pedestrians

Navlakha to Asarambapu


1. Public van and other vehicles are parked on the space available for walkway, unmountable walkway can solve the problem and protect pedestrians to walk between the vehicles.
2. Dumpster and animals on the temporary sidewalk making it difficult for pedestrian to use it.

Railway Station to Sarvate Bus Stand

No pedestrian facility at the busiest transport terminal in the city, a foot over bridge or a subway make it easy for pedestrian to cross.

Khajuri Bazaar to Gandhi Hall

1. Sidewalks are completely occupied by two wheeler parking pedestrians are walking on the road between the vehicles. This can be controlled by law and enforcement.
2. No crosswalks on the road make it difficult for pedestrians to cross. Raised crosswalks can slower the traffic at this busy road and make it more pedestrian friendly.

Cloth Market to Patel Bridge

Parked two wheeler and a police booth on the walkway left no space for pedestrian to walk on it. Being a most commercialized area of the city should be made no vehicle zone for safe maneuver of pedestrian.

HIG Main Rd.

1. At this temple the carriageway narrows to only 2 lanes. Despite the narrowing, no bottlenecks in vehicle traffic are observed, demonstrating that the traffic volume can be accommodated with just 2 lanes.
2. This speed limit sign blocks nearly the full footpath; it could easily be redesigned with a single support to be unobstructive.

Racecourse Rd. GS to Mahidpurwala


1. Parking lot spillout completely blocks footpath.
2. Dumpsters kept in footpath obstruct the footpath and lead to litter and smells.

Navlakha Bus Stand Agrasen Statue


Available sidewalk is very untidy discourages people to walk on it and also roadside vendors occupied the walkway break its continuity.

Navlakha Bus Stand AB Rd.


No boarding alighting facility for the pessengers coming to Bus Stand by public van or rickshaw they have to board or alight on the road only.

Annapurna Road


1. This sign completely blocks the footpath. The second pole and central placement are unnecessary.
2. This wide curb radius means a longer distance for pedestrians to cross, and means they are more at the periphery of drivers' field of vision.

Marimata Square to Barganga Police Station.


Being an industrial area, high number of pedestrian and cyclist are there but no supporting infrastructure is available. Addition of a NMV lane will helps the user.

Gangwal Bus Stand

Another busy transport terminal of the city no sidewalks are present. Buses and the other vehicles are parked on the portion of the road marked for pedestrians. Unmountable sidewalks and subways should be constructed.

RNT Marg from Gandhi Statue to Nehru Statue

1. There is no crossing opportunity near the Center Mall, despite the fact that many people want to cross here.
2. Median provides no crossing assistance. Improperly aligned with crosswalk and no space for pedestrians to walk.

Manik Bagh Rd.

1. Mountable curbs invite parking obstruction.
2. The distance to be crossed at Palsikar Junction is quite long. The median provides little refuge and the crosswalk is encroached upon by queued vehicles.

YN Rd. City Center to Malwa Mill Square

1. Parked vehicles are perhaps the most egregious obstruction in this corridor. Here, the shopping center's lot has taken over the footpath. Ways to move parked vehicles to the curb, where excess carriageway space could be devoted to parking, should be explored. This space holds great potential for benches or other pedestrian amenities
2. Bollards could prevent vehicles from parking on this curb, without eliminating the ramp.

Malwa Mill Square to Patnipura


This area is surrounded by the low income group people. Lot of activity on the street but no separated walkways are there.

Patnipura to Rasoma Lab

1. Fruit and vegetable vendors interfere with movement on the northbound side near Patni Puri Jn. This appears to be one of the city's major vegetable markets and is heavily patronized. The vendors likely value the high level of exposure from this heavily traveled road.
2. Industrial spillout obstructs and soils the footpath.

3.3 Stakeholder Interviews

The three main agencies responsible for pedestrian facilities in Indore city are

- Indore Municipal Corporation (IMC).
- Indore Development Authority (IDA)
- Traffic Police

Interview has been conducted with the official of above mentioned agencies. And finding are as follows.

- There are insufficient pedestrian facilities like footpath, zebra crossing etc. Vehicles are parked on the footpath, lack of enforcement.
- In total accident fatality about 15-25% is pedestrian fatality.
- About 40-60% is the pedestrian trip mode share in total trips in city.