Nagpur Urban Streets Assessment

Assessing the walking and cycling condition on the streets for Nagpur

April 2024 - March 2025

Part I • Impact Assessment & Comparative Analysis

Prepared for Nagpur Municipal Corporation by ITDP INDIA

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Acknowledgements

STUDIO

We would sincerely like to thank the team of volunteers associated with Another Earthling Studio

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Image source: All images are by ITDP India, unless mentioned otherwise.

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Part I • Impact Assessment & Comparative Analysis

Foreword

Dr Abhijeet Chaudhari
Municipal Commissioner
Nagpur Municipal Corporation

Beyond facilitating transportation, the city's street network serves as crucial public spaces offering diverse social, economic, and recreational opportunities for citizens, including vulnerable users like children, the disabled, and the elderly. Notably, 23% of Nagpur's daily trips, spanning jobs, education, and amenities, are made by foot, cycle, and public transport.

Over the last decade, Nagpur has witnessed a surge in private motor vehicles, causing congestion, road safety issues, and environmental challenges. However, our city is cognizant of the impact on vulnerable street users. To achieve this, Nagpur is prioritising robust pedestrian and cycling infrastructure, encouraging active modes of transport.

Nagpur is actively investing in ‘Healthy Streets’ and has already implemented more than 15 km. Along with this, it is equally important to assess the impact of such projects, to make sure the city is on the right track and improves its mistakes going ahead. We look forward to this document as a guidebook for our future street design works. We hope to see Nagpur’s streets transform into accessible, safe and equitable streets for all!

Aswathy Dilip
Managing Director
ITDP India

Nagpur Urban Streets Assessment is a key step in creating safer, more accessible streets for all. Walking and cycling are essential for equitable access to opportunities like education, employment, and recreation. However, poor infrastructure discourages these modes, leading to increased private vehicle use, congestion, pollution, and safety issues.

We thank the Nagpur Municipal Corporation (NMC) for its commitment to improving walking and cycling infrastructure. This study identifies challenges and opportunities to improve safety, accessibility, and connectivity on Nagpur's streets.

Streets should serve people of all ages and abilities—children, the elderly, and those with disabilities—ensuring a comfortable experience. By prioritizing pedestrian-friendly and universally accessible streets, Nagpur can create a more inclusive urban environment.

The findings will help urban planners, engineers, and policymakers make informed decisions that promote safer streets, reduce traffic conflicts, and improve quality of life. ITDP is committed to supporting NMC in implementing these recommendations for a city where streets serve people, not just vehicles.

Introduction

Walking and cycling provides affordable travel to all sections of the society to access work, education, recreation and other activities.

The absence of safe and comfortable walking and cycling infrastructure increase the dependency on personal motor vehicles, especially for short trips. This results in congestion and air pollution in the city and has a negative impact on health, environment, and economy. It also negatively affects road safety, inclusivity, and universal accessibility.

Nagpur has been taking steps to improve walking and cycling experience in the city, transforming the streets through the street design initiatives including the Nagpur Healthy Streets Programme, Junction Improvement Programme and the School Zone Improvement.

This analysis sheds light on the gaps in our streets and helps to identify the areas in need of interventions. Urban designers and engineers are expected to use these indicators to analyse the impact of street designs going forward.

Need for the Study

To identify gaps
in existing practices in designing and implementing streets

To create a standardised evaluation system
for all streets

To create funding provisions
for scaling up street design

To craft an impactful narrative,
supported with data and evidence

Street Design Principles

1 | Ease of movement

Streets should provide continuous and safe passage irrespective of crossings, junctions, or property entrances.

3 | Universal Accessibility

Streets should be accessible for all, irrespective of any permanent or temporary disability.

2 | Safety

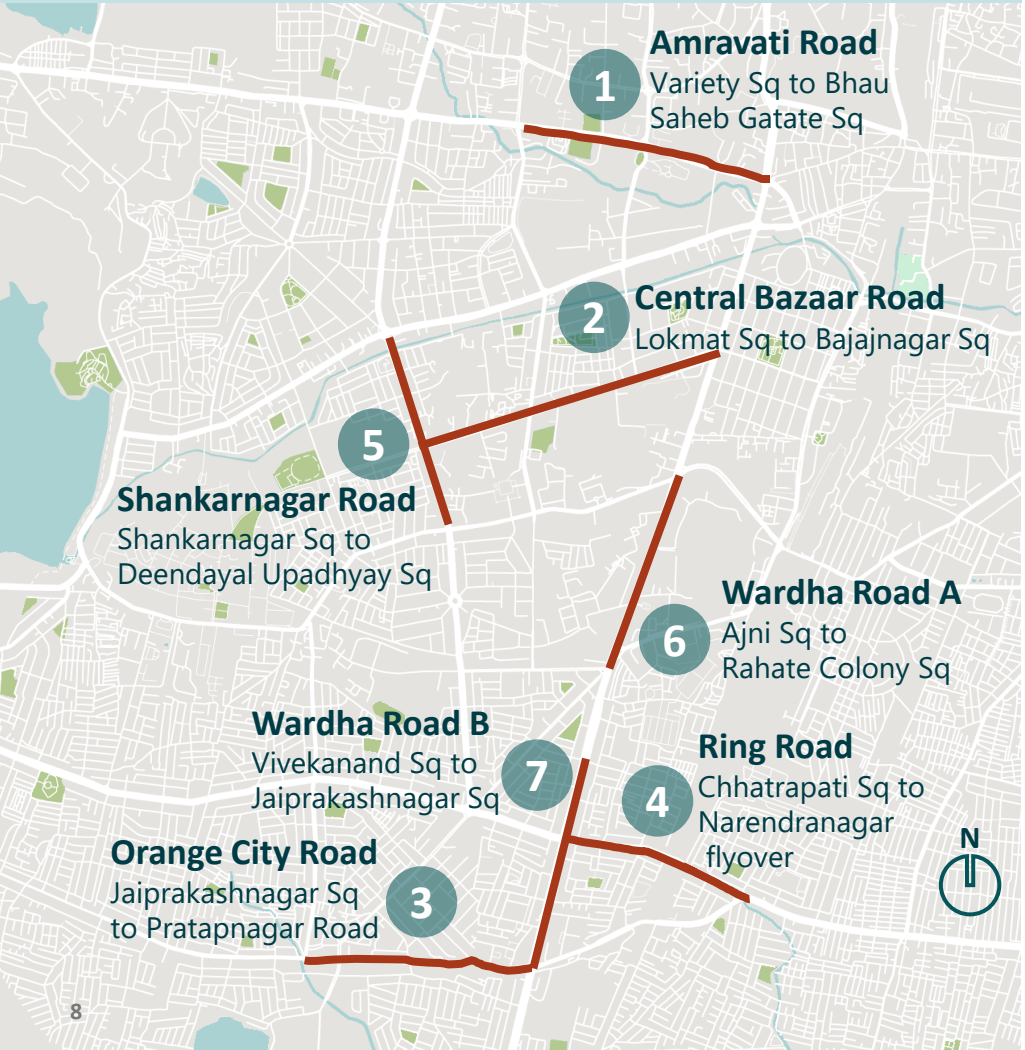
Streets must provide safety for all users by addressing concerns like moving traffic, pedestrian crossings, and night-time security.

4 | Liveability

Streets should provide convenient and comfortable opportunities to rest, pause and play for all, irrespective age, gender, and ability.

Methodology

7 stretches were selected in consultation with engineers from the Nagpur Municipal Corporation, adding to a total of 10 km approximately.



3 types of surveys

captured insights as part of the assessment

Design Survey

To understand how well the street is designed (following the IRC guidelines) against a set of indicators and sub indicators

Observation Survey

To understand how the street is being used, and whether walking and cycling facilities are being used as desired

*Separate surveys (design and observation) were conducted for Left-Hand-Side (LHS) and Right-Hand-Side (RHS) of the streets. All surveys were conducted between March and May 2024, during morning (9 am to 11 am) and evening (5 pm to 7 pm) peak hours.

Perception Survey

To understand how people experience the street, it is necessary to seek direct feedback from users, especially from vulnerable users such as women, school-going kids and the elderly

We surveyed an equal number of men and women street users, totalling 330 participants.


UBQ DELIVERY

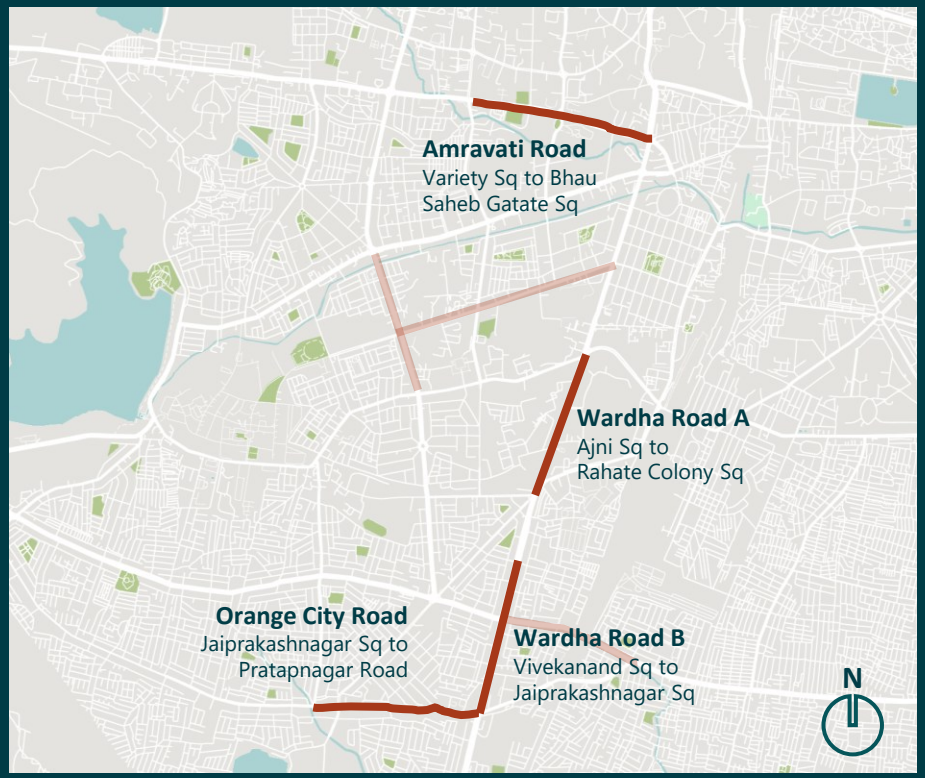

GOODS PNR CARD


SECURITY ROOM

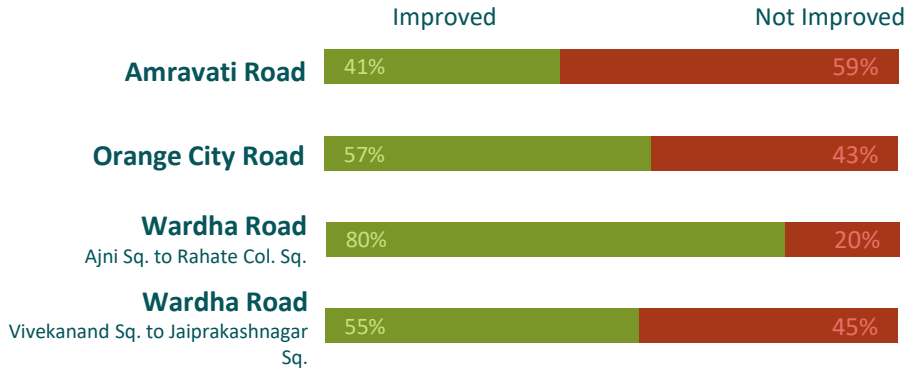
Impact Assessment

This section analyses the impact of interventions by comparing the conditions before and after the street redesigns. The impact assessment is based on approximately 35 user perception surveys for each redesigned street, conducted with individuals who experienced these streets before the redesign.

Out of the seven street stretches studied, four have been recently redesigned: Amravati Road, Orange City Road, and two stretches of Wardha Road. The segments analysed are highlighted below.

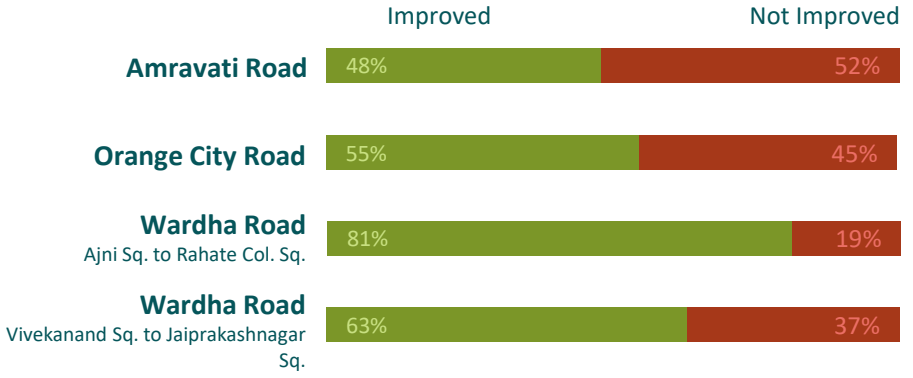


Changes post-redesign



Around 80% of people reported Wardha Road (Ajni Sq. to Rahate Colony Sq.) **improved vastly based on walkability, cyclability, and safety.**

Improvement in Safety



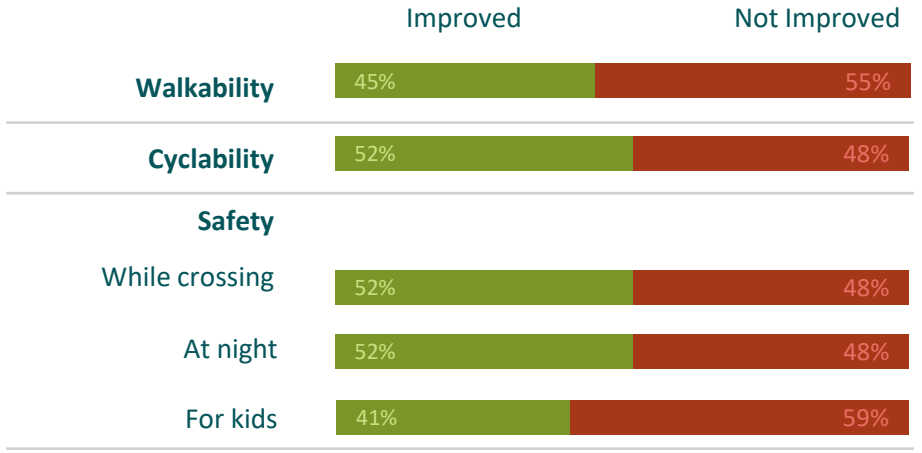
Though around 75% respondents on Wardha road have reported improvement in safety; on Amravati road and Orange city road, around 50% of respondents still feel safety is an issue.

Amravati Road

Redesigned in 2023

Amravati Road had a non-standard footpath and no cycling infrastructure.

The street now has a footpath and cycle track and a total of around 4m wide segregated NMT zone



What's working?

Around half of the total respondents claimed positive changes in walking and cycling and overall road safety

What needs to improve?

People still feel **high vehicular speeds** result in difficulty in crossing, especially at junctions like Variety Square.

People have also highlighted the **increase in heat** as compared to pre-redesign making walking uncomfortable

Other issues reported by respondents are:

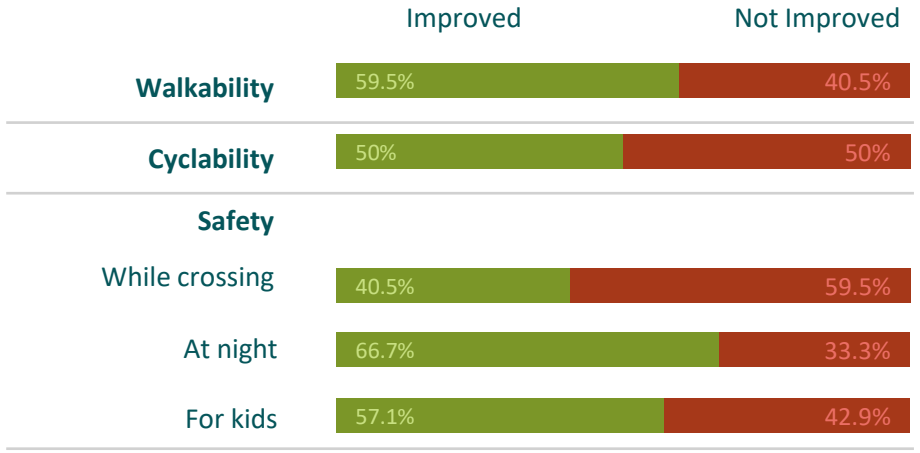
1. The street is dimly lit at night and doesn't feel safe
2. The footpath is not continuous in certain stretches and has an uneven surface
3. The footpath is encroached by vendors and vehicles, hence they are forced to walk on the cycle track.
4. Parked buses make the footpath feel unsafe to walk

Orange City Road

Redesigned in 2022

Concrete carriageway without NMT facilities (executed in stage 2 of the white-topping plan)

Currently, the street has a footpath and cycle track and a total of around 4m wide segregated NMT zone



What's working?

More than **50% of respondents reported improvements in walkability and safety**.

They also felt that the weekly market on this street is more organised now but vending still spills over.

What needs to improve?

Safety while crossing, and **cyclability** remain major concerns.

Other issues reported by respondents are:

1. Vehicles have fully encroached on certain parts of the footpath
2. Parking management is non-existent and is a big issue throughout the street
3. Vendors have encroached footpaths around major junctions, forcing pedestrians to walk on the carriageway
4. High vehicular speeds are observed even during the daytime

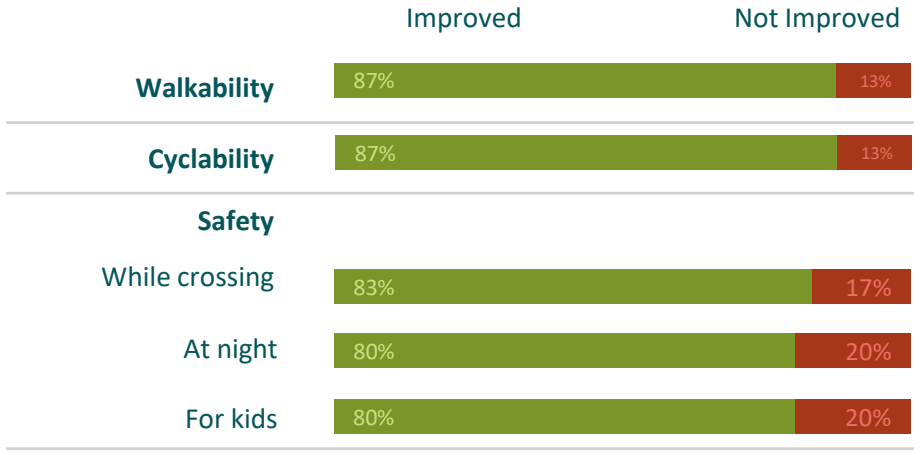
Wardha Road

Ajni Sq. to
Rahate Col. Sq.

Redesigned in 2023

The street had a standard footpath, with a very low footfall

The street has a segregated footpath and cycle track as per IRC with placemaking elements and ample shade



What's working?

Around **80%** of respondents have noted that the **overall street experience has improved.**

What needs to improve?

No signages or markings to show cyclists the presence of a cycle track

The street **is difficult to cross** due to high vehicular speeds

Other improvements appreciated by respondents are:

1. Presence of shade and seating during the day
2. Segregated and safe walking and cycling
3. The feeling of safety at night due to adequate lighting

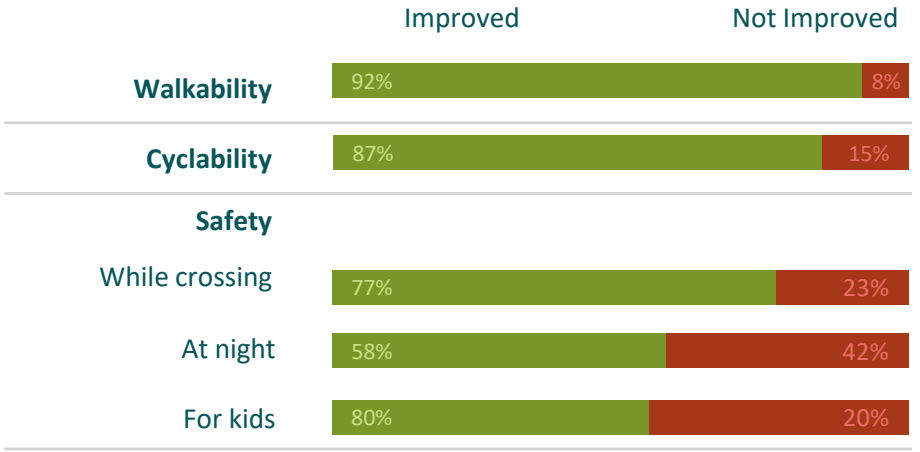
Wardha Road

Vivekanand Sq. to Jaiprakashnagar Sq

Redesigned in 2023

The street had a standard footpath, with a very low footfall

The street has a segregated footpath and cycle track as per IRC with placemaking elements and ample shade



What's working?

More than **75%** of the respondents reported **improvement in walking, cycling and safety while crossing on the street**.

Respondents had positive comments on:

- Presence **of seating infrastructure and landscape**.
- **Cycle track being continuous** but encroached

What needs to improve?

Vehicular and vendor encroachment

Other issues reported by respondents are:

1. Footpath is discontinuous due to property ramps and huge level differences between the street and property entrances
2. Vehicles are parked on the footpath even after designed segregation
3. Vendor encroachment near the junctions
4. Bus bays do not work on this road, Buses park on the carriageway.
5. Not enough crossing points due to high median

More than 4m of NMT space reclaimed on Amravati Road

Shaded & segregated walking space along Orange City Road

Crossings at junction improved to include table-tops and pedestrian refuge on Wardha Road (Vivekanand Sq. to Jaiprakashnagar Sq.)

Rest & Pause spaces created along with segregated NMT zone on Wardha Road (Ajni Sq. to Rahate Col. Sq.)

Following are the key observations based on the impact assessments-

i Walking has improved significantly on all the selected streets, especially on Wardha Road.

ii People feel cycling has improved on Wardha Road but Orange City and Amravati Road still need major improvements.

iii Although **62**% of respondents noted improvement in crossing the streets, around **46**% of respondents still feel unsafe due to high vehicular speeds

iv Around **65**% of Wardha road respondents reported the new design is safer for kids.

The ~~In~~visible Cyclists of Nagpur

"I was unaware of the cycle track on Wardha road.

"It is impossible to use the cycle track on Orange City road as it is completely occupied by parked vehicles.

"I cannot see the incoming vehicles at junctions at clock Tower Junction. My parents don't allow me to go to school on cycle.

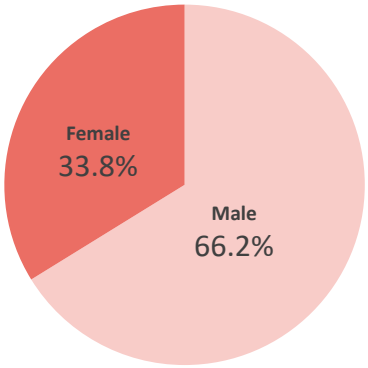
Who cycles in Nagpur?

Some for their livelihoods,
Some to go to school,
Women who go to work,
And some because it's cool.

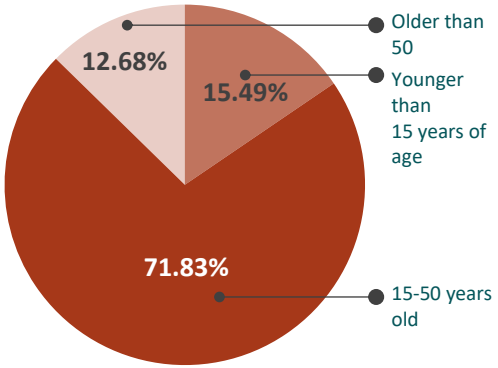
Some because it's cheaper
And helps them save the fare,
Some for its sustainability,
To show they really care.

Who Cycles?

By Gender

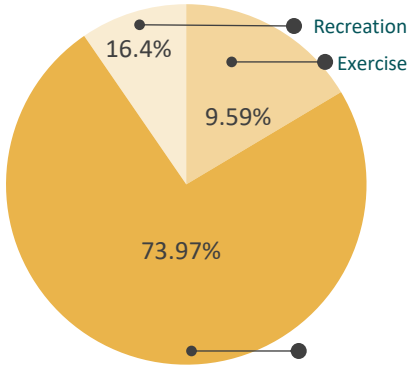


By Age



Why do they Cycle?

By purpose



Some streets during peak hours recorded almost 160 cyclists over an hour!

What makes cycling challenging?

Number of Responses	Type of Obstructions
45	Vehicles parked/plying on cycle track
44	Absence of cycling infrastructure
26	Improper cycling infrastructure
21	Obstructions (bollards, bins, distribution panel boxes, etc.)
14	Lack of continuous cycle network
13	Pedestrians walking on cycle track/lane
13	Encroachment
12	Lack of shading

72% of the non-cyclist respondents are willing to cycle for shorter trips if safer cycling infrastructure is provided

Recommendations

- City should adopt "cycling" as a mandatory mode share measure in the **Street Design Guidelines**
- All streets with ROW of 24m or more should have segregated cycle-track per latest IRC norms
- Streets with no segregated cycle tracks should be designed to have **vehicular speeds of not more than 30 kmph**
- **Junctions should ensure cycle track continuity** and signal phasing to give priority to cyclists
- All Streets with cycle tracks should have **appropriate signage and road markings Bollards of lower height should be installed** on cycle tracks to avoid entry of other vehicles

Comparative Analysis

The summary provides cumulative scoring based on all surveys for the selected streets. The intention of the table is to help us understand the severity of the need for intervention on the streets. The scoring of streets can be improved by intervening accordingly.

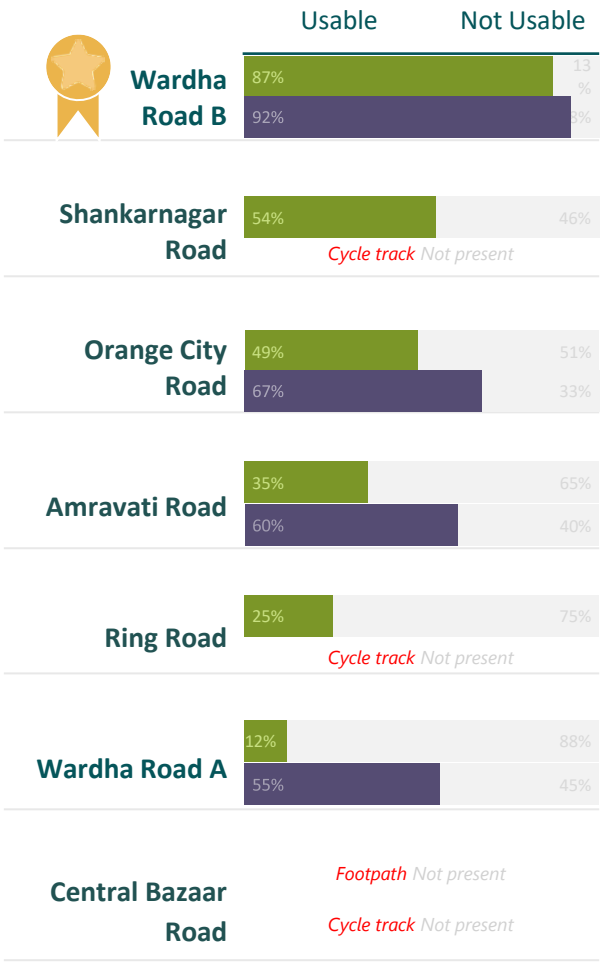
Rank	Street Name	Design Score (Out of 10)	Observation Score (Out of 10)	Perception Score (Out of 10)	**Total (Out of 30)**
1	Wardha Road A	8 Good	8 Good	8.75 Good	24.75
2	Wardha Road B	6.25 Unsatisfactory	6.25 Unsatisfactory	6.25 Unsatisfactory	18.75
3	Shankarnagar Road	4.25 Unsatisfactory	2 Poor	8.25 Good	14.5
4	Amravati Road	3 Poor	3.75 Unsatisfactory	5.5 Unsatisfactory	12.25
5	Orange City Road	4.75 Unsatisfactory	2.5 Poor	5.75 Unsatisfactory	13
6	Central Bazaar Road	1.75 Poor	0.5 Poor	4.5 Unsatisfactory	6.75
7	Ring Road	1.5 Poor	1.25 Poor	3.75 Unsatisfactory	6.5

Wardha road (Ajni Sq. to Rahate Colony Sq.) has performed well on all aspects. Wardha Road (Vivekanand Sq. To Jaiprakashnagar Sq.) and Shankarnagar Road have decent footpaths but require interventions to further enhance their usability. **Streets like Central Bazaar (currently being undertaken through the Healthy Streets Programme) and Ring Road have fared poorly and require immediate attention.**

Usability

Usability is characterised by adequately wide, continuous and obstruction-free infrastructure that is physically segregated from vehicular traffic.

(Based on observation survey)



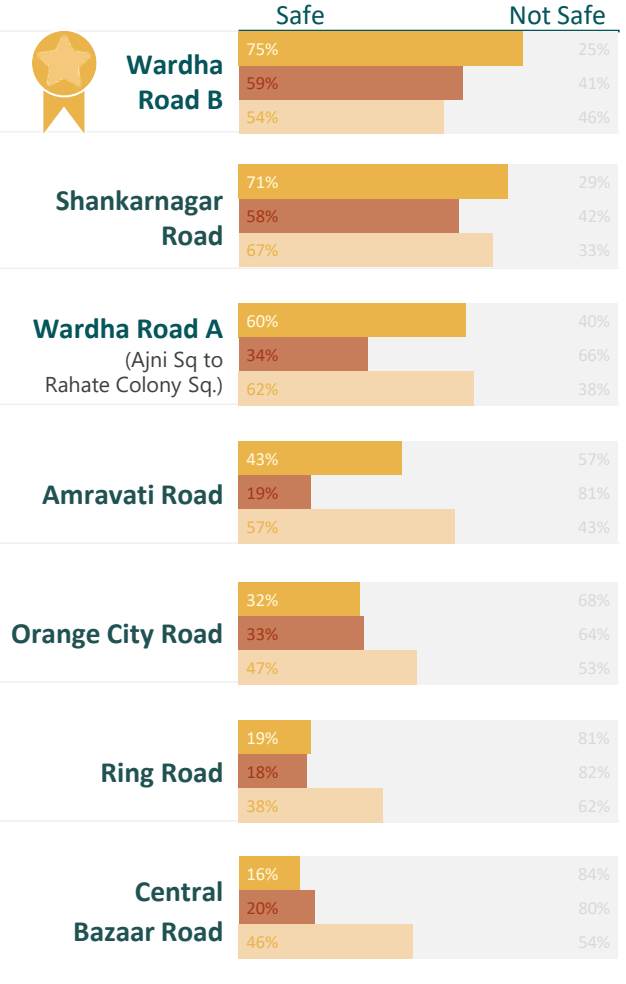
On other redesigned streets (Wardha road B (from Vivekanand Sq to Jaiprakashnagar Sq.), Amravati road, and Orange City road), footpaths are encroached or obstructed, while cycle tracks are fairly continuous and usable—hence, people prefer walking on cycle tracks. Ring road and Central Bazaar Road **do not have usable walk-cycle infrastructure**.

(Based on observation survey)

Safety

Safety is characterised by physically segregated infrastructure from vehicular traffic, good lighting, safe crossing infrastructure, speed calming elements.

(Based on perception surveys)



Only Wardha Road and Shankarnagar Road have more than 50% of respondents saying that the street had **adequate width to walk and safe to cross.**

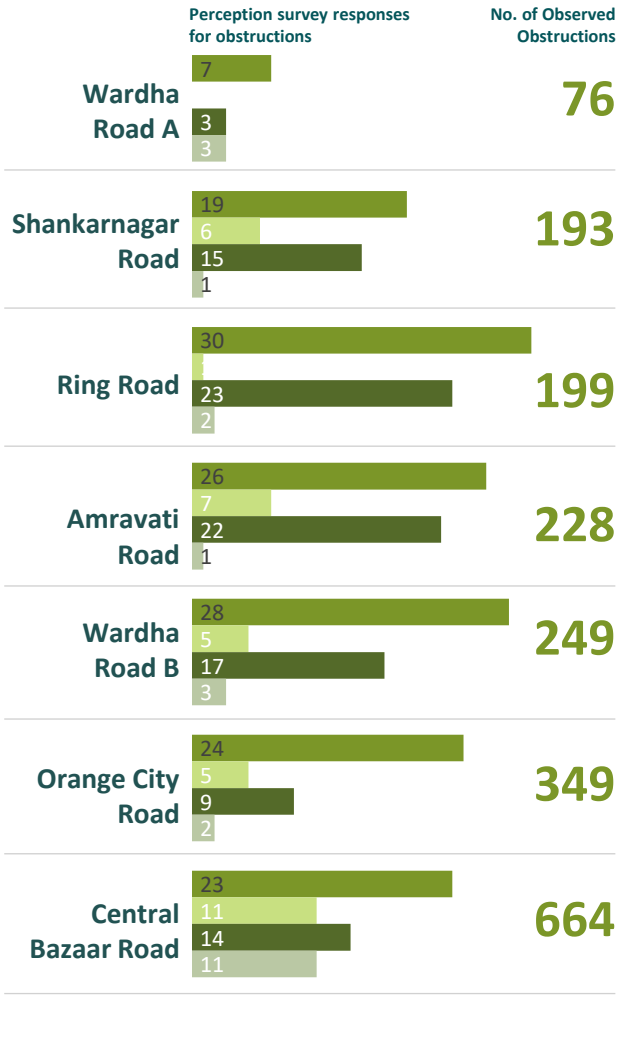
More than 50% respondents say that Wardha road and Shankarnagar Road are **safe for kids to use.**

Ring Road and Central Bazaar Road were recorded as the **most unsafe streets.**

Walking Obstructions

Barriers on footpaths that impede pedestrian movement, such as utility boxes/poles, uneven surface, and vending and vehicular encroachments.

(Based on perception & observation surveys)



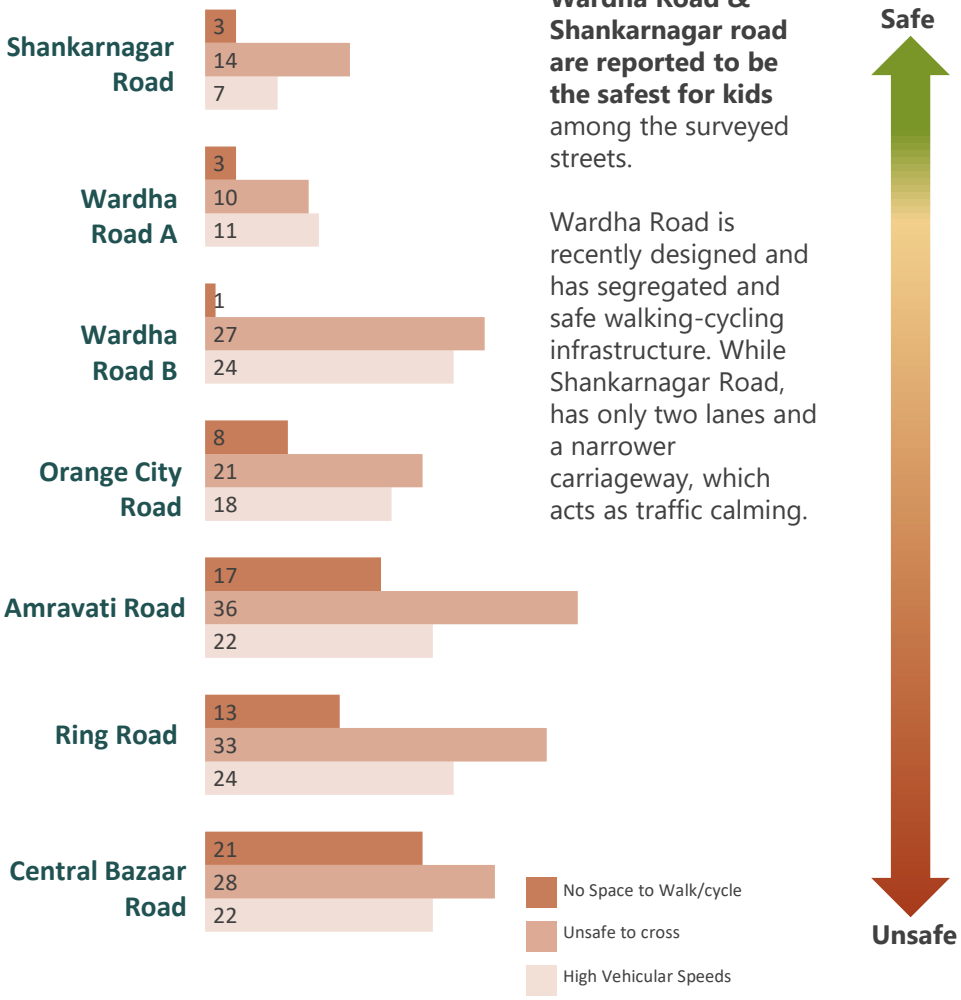
Wardha Road (Ajni Sq to Rahate Colony Sq), has recorded the **least number of obstructions** through observation and perception surveys.

Central Bazaar Road has currently the highest obstructions on footpaths, and is highly unwalkable with **vehicular and vending encroachment**. *(Based on observation and perception surveys)*

Safety for Kids

A street safe for kids has low traffic speeds, safe pedestrian crossings, and ample space for walking and play, that is free from hazards and obstructions.

(Based on perception surveys)



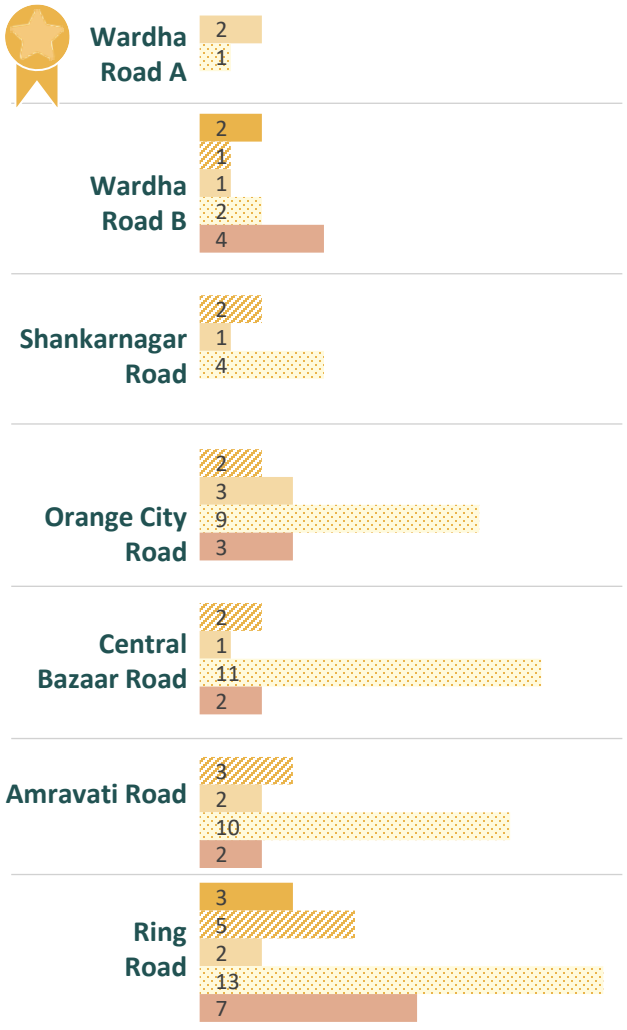
Wardha Road & Shankarnagar road are reported to be the safest for kids among the surveyed streets.

Wardha Road is recently designed and has segregated and safe walking-cycling infrastructure. While Shankarnagar Road, has only two lanes and a narrower carriageway, which acts as traffic calming.

Safety at Night

A safe street at night is well-lit, has clear and unobstructed pathways, and effective traffic calming measures to reduce speed and enhance visibility.

(Based on perception surveys)



Recently designed Wardha Road (Both stretches), Orange City Road, and Shankarnagar Road **were perceived to be relatively safe**.

Ring Road & Amravati Road were reported to be the least safe at night. Poor lighting is the most highlighted issue, along with fear of crime, and a few responses mention eve teasing.

Safety while Crossing

Safety is ensured by well-demarcated crossings with appropriate signages, pedestrian signal phasing with sufficient crossing time, and adequate visibility.

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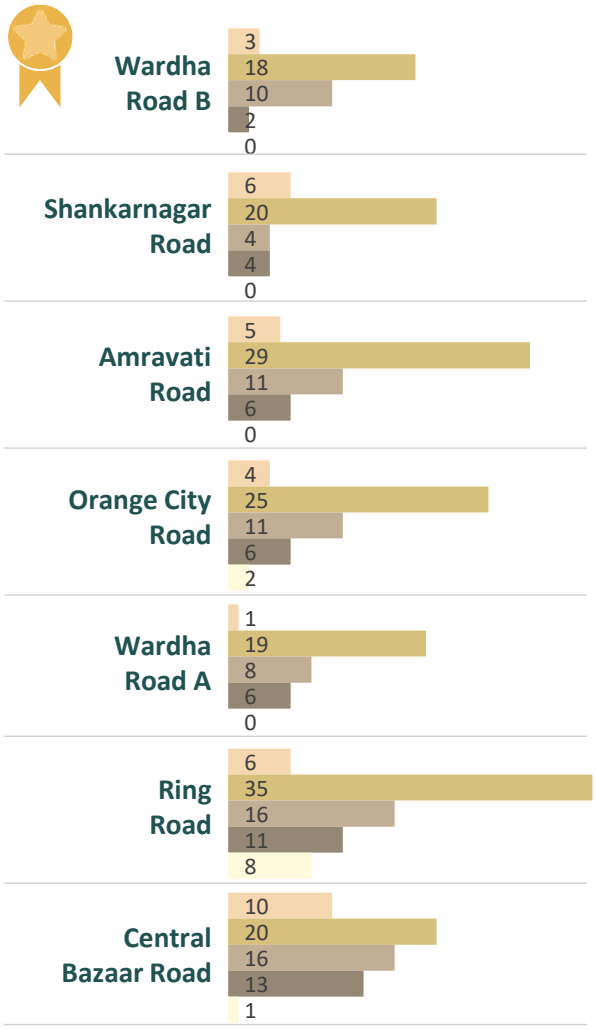
(Based on perception surveys)



Wardha Road was reported to be overall safe to cross. Wardha Road also has undergone junction improvements towards safety and inclusivity.

People have reported high vehicular speeds, lack of safe pedestrian refuges and poor lighting at night as the main issues while crossing streets.

Higher vehicular speeds were recorded on Ring road, Central Bazaar road & Orange city road. *(Based on perception surveys)*

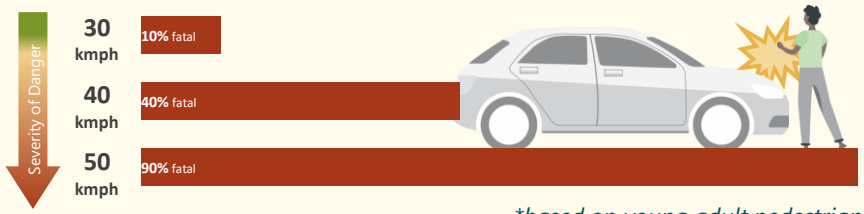
Speed Analysis for Road Safety

Vehicular speed was measured on selected streets using a speed gun, with around 50 samples per street, categorised by vehicle type.

Readings were taken during off-peak hours (after 10pm) to minimise the impact of congestion and other factors, ensuring the data reflects street design and enforcement measures.

Speeds were analysed to determine peak and 85th percentile speeds for each vehicle category.

Chances of dying for a pedestrian getting hit by a car



*based on young adult pedestrians

According to IRC and international guidelines, **ideal speeds on urban streets** should typically be between **30 to 40kmph**, **none of the selected streets meet this guideline.**

All speeds in kmph

#	Street Name	Peak Vehicular Speed **Car**	Most Recurring Speed **Car**	Peak Vehicular Speed **2-Wheeler**	Most Recurring Speed **2-Wheeler**
1	Amravati Road	54	51	75	48
2	Central Bazaar Road	62	47	57	47
3	Orange city Road	56	52	70	53
4	Shankarnagar Road	47	44	65	46
5	Ring Road	60	47	61	49.5
6	Wardha Road	63	58	61	58

A summary of vehicular speed data collected for surveyed streets in non-peak hours.

For cars, all streets recorded peak speeds above **45kmph**; Wardha Road, Ring Road, and Central Bazaar Road recorded the highest peak speeds of **60+kmph**.

2-wheelers speeds were observed to be even higher. Peak speeds at almost all streets was above **60kmph**; Amravati Road and Orange City Road had recorded peak speeds around **70kmph.**


NEWERA
MOTHER CHILD
HOSPITAL
Dental Clinic

City-wide Recommendations

Through the study, there is clear data on what works and what doesn't on the streets of Nagpur for pedestrians and cyclists.

Although some of the problems on the selected streets are contextual, most of the issues are common and need to be dealt with a holistic approach.

A unified vision with city-wide policies, plans, and guidelines can help in a uniform transformation where the same issues needn't be discussed repeatedly.

Developing the capacity of engineers, contractors, enforcement officers and, most importantly the decision-makers is important for long-term resilience.

1 | Non-Motorised Transport Policy

By adopting the NMT Policy, NMC can set a vision and goals for the city. A dedicated policy for pedestrians and cyclists helps in:

- Institutionalising the reforms,
- Acting as a guiding tool for all future development,
- Setting up mandates, roles and responsibilities.

2 | Streets Network Plan

A city-wide non-motorised network plan helps to identify the streets to be undertaken for re-development in phase-wise manner. It also helps for:

- Annual dedicated budget allocation,
- Onboarding expert design consultants,
- Monitoring and Evaluation.

3 | Urban Street Design Guidelines

It will facilitate coordination and ensure uniformity between multiple implementing agencies for:

- Uniform street template & designs,
- Standardisation of materials & rates,
- Tendering process & quality control.

4 | Traffic Calming on All Streets

Vehicular speeds are as high as 70 kmph in some of Nagpur's streets. Creating a traffic calming policy will help the city reduce vehicular speeds, creating safer streets. The city can start with:

- Setting a speed limit for urban streets,
- Introducing speed tables/humps to reduce vehicular speeds,
- Creating a Traffic-Calming guideline/policy,
- Initiating a Junction Improvement Program.

5 | Safe School Zone Program

Nagpur's streets have recorded a number as high as 160 cyclists in peak hour, mostly captive cyclists who cannot rely on any other mode. Nagpur can start with:

- Including cycle tracks on streets having at least 24m ROW,
- Creating School Zone Improvement Plans,
- Creating safe and compact junctions around schools,
- Strong communications towards school zone safety through proper signages, paint markings etc.

6 | Climate Responsive Street Design

To ensure climate extremities (like rainfall, excessive heat) do not affect the use of streets for vulnerable street users, NMC can start with the following:

- Including stormwater drainage system as a part of every street project,
- Using techniques like bioswales, recharge pits etc for ground water recharge,
- Use of renewable construction materials,
- Planting trees as a part of every street to ensure shading.

7 | On-street Parking management

Most footpaths are encroached by vehicles, hence not walkable. Parking enforcement will solve this problem, and will also gain added revenue for NMC. NMC can start by

- Identifying key areas for parking management,
- Appointing consultants to create parking plans,
- Enforce parking in the identified area.

8 | Capacity Building of the team

Nagpur's officials and engineers can benefit from visiting cities that have Healthy Streets best practice examples to study:

- Network-level planning and design,
- Implementation techniques,
- Materials and quality control.

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