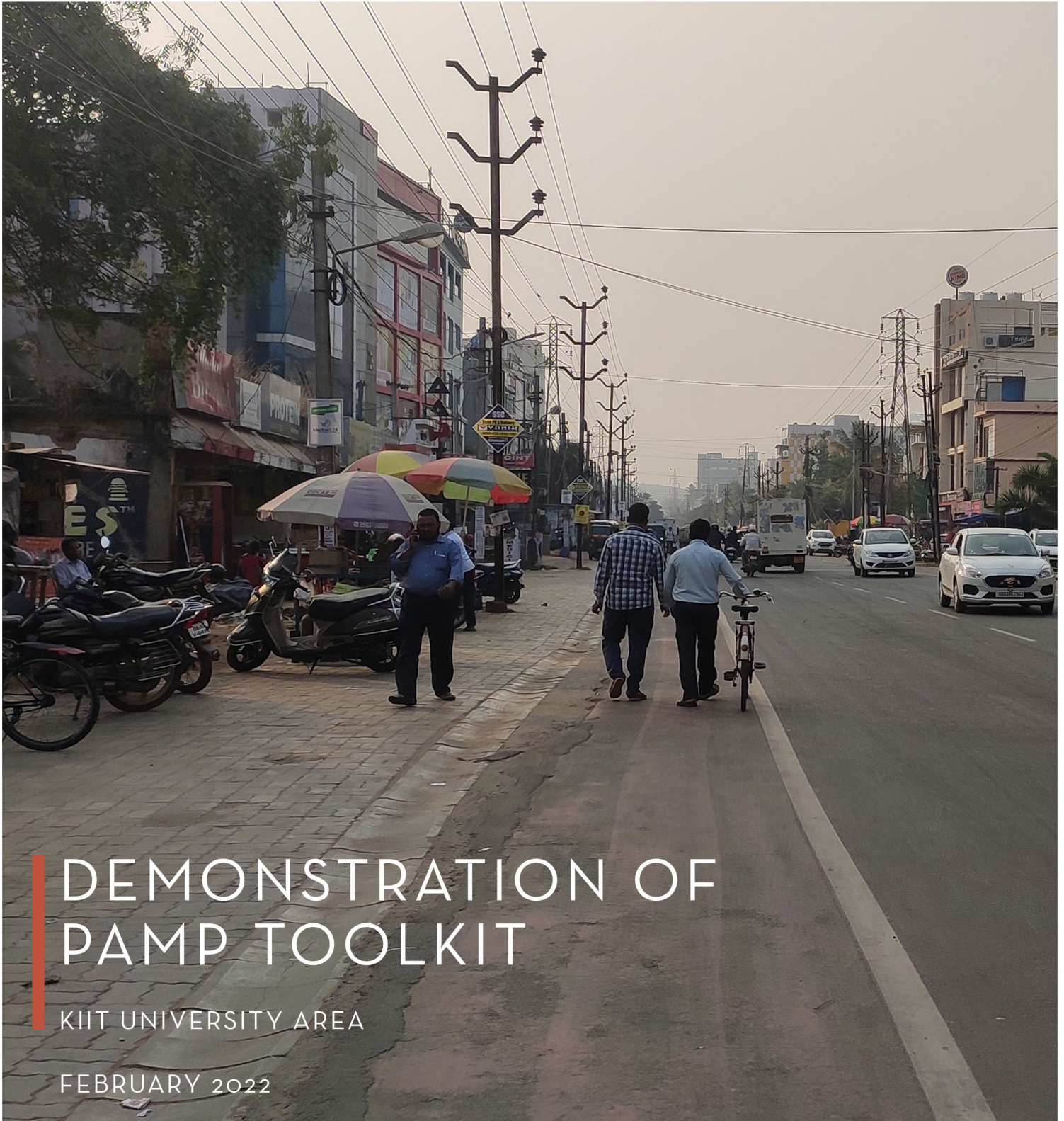




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DEMONSTRATION OF PAMP TOOLKIT

KIIT UNIVERSITY AREA

FEBRUARY 2022

CoE-UT CENTER OF EXCELLENCE IN URBAN TRANSPORT

CRDF CEPT RESEARCH AND DEVELOPMENT FOUNDATION

CEPT UNIVERSITY

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New Delhi, India
February 2022

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Source : CoE-UT, 2021

ABOUT THIS REPORT

This toolkit has been prepared to support the implementation of the "Parking Policy for Bhubaneswar" in cooperation with the responsible agencies. The objective of the study is to prepare a guiding document for understanding the existing parking situation and defining a mechanism to monitor, implement and enforce the strategies proposed for parking management plan. The project has been supported as part of the bilateral technical cooperation project "Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT)" commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and jointly implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and Ministry of Housing and Urban Affairs (MoHUA), Government of India.

Volume 1 : The toolkit focuses on the process of demarcating the Parking Area Management Plan (PAMP) area, analysing the existing situation by conducting various primary and secondary surveys, strategies to be used based on parking issues and area characteristics and, evolving guidelines for implementation of prepared PAMP to improve the parking situation in the area. Survey format and stakeholder consultation questionnaire has been included in the Annexure.

Volume 2 : Step by step details for preparing PAMP for Master Canteen Area.

Volume 3 : Step by step details for preparing PAMP for KIIT University Area.

The toolkit would provide guidance to city officials and consultants involved in the preparation of Parking Area Management Plans. Using the two areas as examples, the application of the toolkit is shown in detail step by step.

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Source : CoE-UT, 2021

ABBREVIATIONS

BBSR	Bhubaneswar Bus Rapid Transit System
BDA	Bhubaneswar Development Authority
BMC	Bhubaneswar Municipal Corporation
BSCL	Bhubaneswar Smart City Limited
BUKC	Bhubaneswar Urban Knowledge Centre
BU	Building use
CAGR	Compound Annual Growth Rate
CCTV	Closed Circuit Television
CPMC	City Parking Management Committee
CoE-UT	Center of Excellence in Urban Transport
CRDF	Cept Research and Development Foundation
CRUT	Capital Region Urban Transport
FGD	Focus Group Discussion
GDCR	General Development Control Regulations
GPS	Global Positioning System
IPT	Intermediate Public Transport
ITS	Information Technology Services
KPI	Key Performance Index
LCMP	Low Carbon Mobility Plan
LCV	Light Commercial Vehicle
LRT	Light Rail Transport
MAV	Multi-Axel Vehicle
NMT	Non-Motorised Transport
OSRTC	Odisha State Road Transport Corporation
PAMP	Parking Area Management Plan
PBS	Public Bicycle Share
PPP	Public Private Partnership
PPSC	Parking Project Steering Committee
PT	Public Transport
PWD	Public Works Department
ROW	Right of Way
RTO	Regional Transport Office
UMTA	Unified Metropolitan Transport Authority
UTF	Urban Transport Fund



Source : CoE-UT, 2021

BACKGROUND

Bhubaneswar city has been experiencing heavy vehicular growth leading to high parking demand for some time now. The registered vehicles have increased at a CAGR of 16% from 2015 to 2019 with vehicle ownership growing at 12%. In the last five years, the city has also seen a reduction in vehicular speed from 28 kmph to 26 kmph, implying increased congestion on roads.

The LCMP aims on improving the public transport and NMT mode share to 40% and 18% from a current mode share of 8% and 12% respectively. Overall, LCMP strategies promotes usage of sustainable modes of transport and discourages unauthorised parking through pricing and design interventions. The LCMP identified need for Parking Policy which provides guidelines for effectively managing on- and off- street parking in the city. The Parking Policy also identified the need to develop a local area level toolkit for defining and prioritising parking management strategies with an implementation framework. This toolkit has been further demonstrated for two areas as suggested by Bhubaneswar city authorities, based on their location in the city (city centre and peripheral location) and activity characteristics (commercial, institutional, industrial, etc.).

1. Master Canteen Area – It is the core of the city with Railway Station, major bus station, major commercial area (Unit I & Unit II markets) and state secretariate building located in the area.
2. KIIT University Area – Located in the northern periphery of the city, it is educational hub with major universities like KIIT University, CIPET, NIFT, LV Prasad Eye Institute and KIMS Hospital. The area also has major industries namely Kurl-on and Lisa plastics.

DEMONSTRATION AREAS

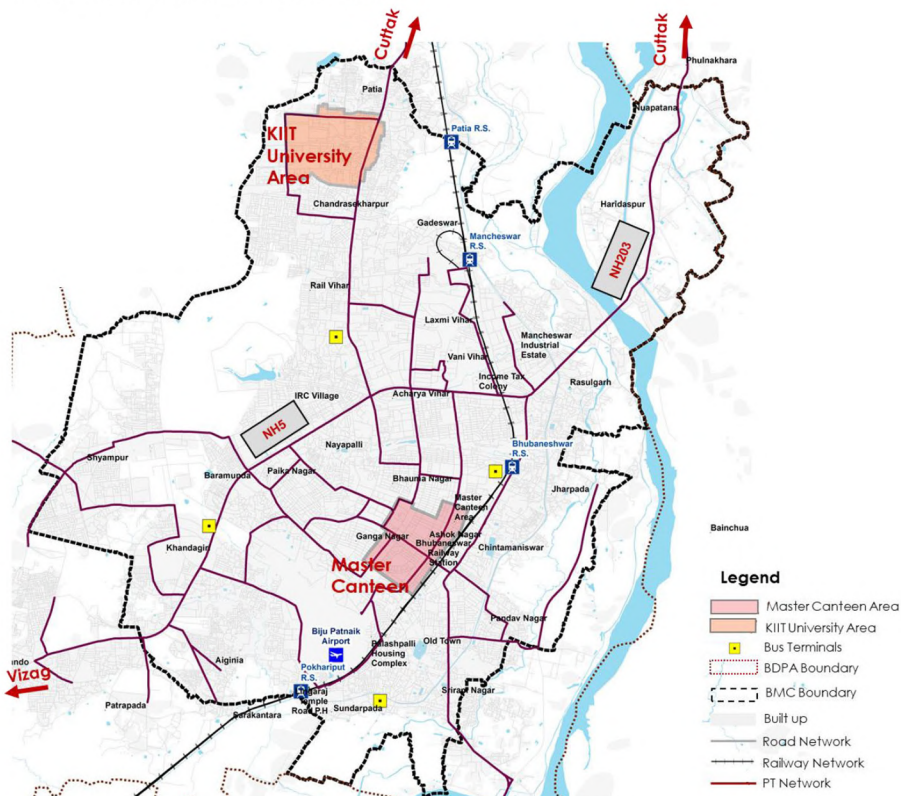


Figure 1 : Bhubaneswar PAMP demonstration areas

Source: Map from Service Level Benchmarking, 2019 – CoE-UT, CRDF

As suggested by BMC officials, the plan has been prepared considering strategies and measures to manage the overall parking supply and user information strategies. The strategies to manage parking demand, specifically, parking permit and parking pricing will be finalised in house by BMC officials at later stage and hence are not detailed out for these areas.

01 DESCRIPTION OF KIIT UNIVERSITY AREA

The KIIT University Area is in the northern zone of Bhubaneswar and is major educational hub of the city. The Nandankanan Road passing through the area connects Bhubaneswar city to Cuttack. The area has many other educational institutes apart from KIIT, namely, NIFT, CIPET Bhubaneswar, KIIT Higher Secondary School, Sai School, BIITM College and Koustav Technical Campus. Apart from educational institutions, the area also hosts IT parks of Infocity and DLF cybercity. The commercial area and local market are located along the Infocity Corridor and Nandankanan Road. The area being an educational hub, it is necessary to have safe and well accessible transport system as it attracts about 35,000 students daily. Hence, in consultation with the stakeholders, the area has been taken as a demonstration area for the developed Parking Area Management Toolkit for Bhubaneswar.

The KIIT university road has good PT connectivity with about 16 buses passing in an hour. The area being an educational hub of the city, it is important to have a parking management plan with measures to improve existing parking situation and road safety in the area. It also promotes sustainable travel modes in view of increasing the PT and NMT mode share as proposed in LCMP,2020 for Bhubaneswar city.

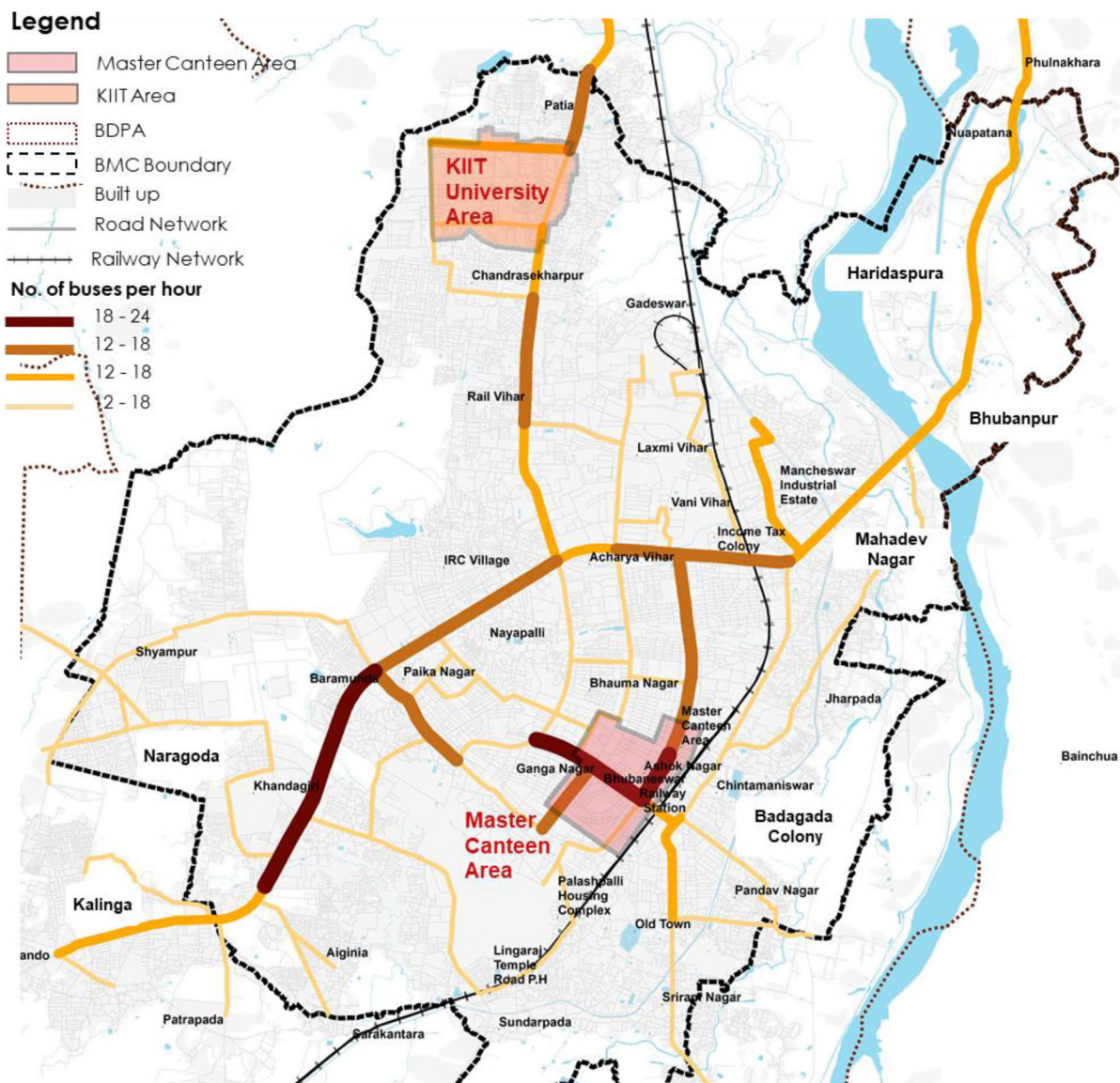
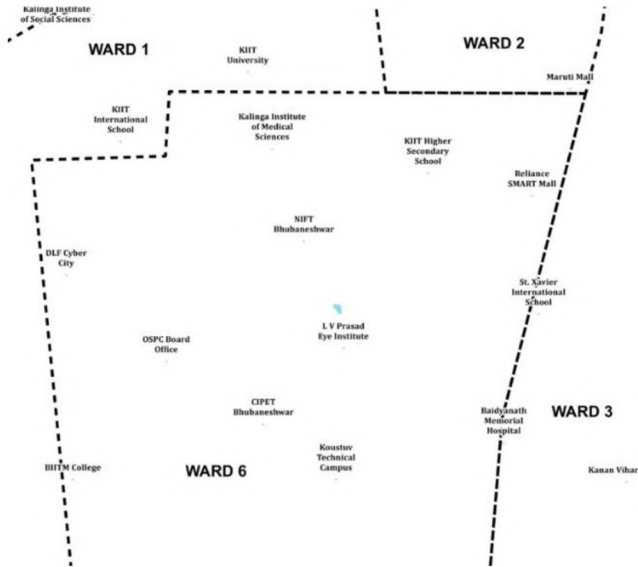


Figure 2 : Public Transport Connectivity in Bhubaneswar City

Source : MO Bus Network – CRUT, 2020

02 DEFINING PAMP AREA

As mentioned in the Part A of the Toolkit section 3.2.1, the PAMP area has been delineated by considering administrative boundaries, road network, transit network and other activities in the area. The study area considered is around 3.3 sq. km consisting of ward nos. 1, 2, 3 and 6.



STEP 1 Administrative Boundary (Ward)

KIIT University area falls under 4 wards

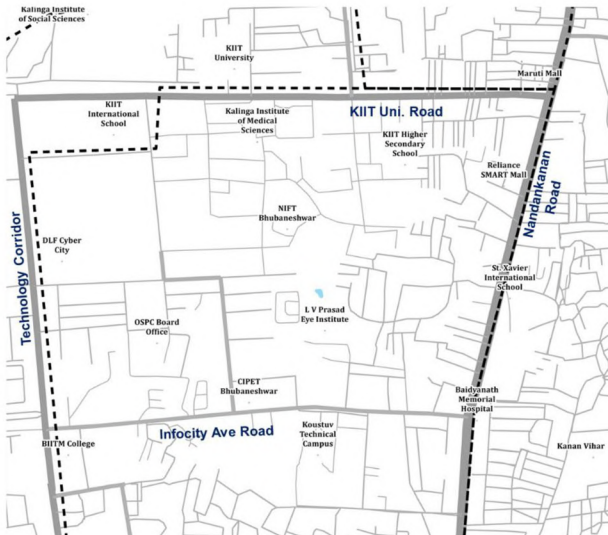
Ward number and Area

- 1 – 2.64 sq.km
- 2 – 0.98 sq.km
- 3 – 5.39 sq.km
- 4 – 3.45 sq.km

Legend

Ward Boundary

Source: Administrative Boundary – Bhubaneswar
One website



STEP 2 Road Network

Nandankanan Road (RoW>36m) is the major road connecting KIIT area to the city center

KIIT University Road (RoW 24-36m) is the major institutional road with good NMT infrastructure (footpath with shed, PBS stops, etc)

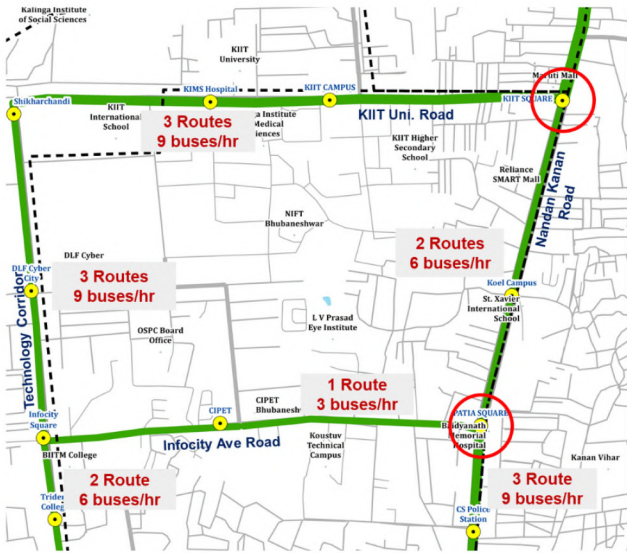
Technology Corridor (RoW 24-36m) is the major road connecting Infocity, DLF cyber city, BIITM, etc.

Infocity Road (RoW 15-18m) connects Infocity, CIPET, Kuostuv college to the major Nandankanan road.

Legend

Road Network
 Ward Boundary
 Railway Network

Source: Road Network – Primary Survey, 2021

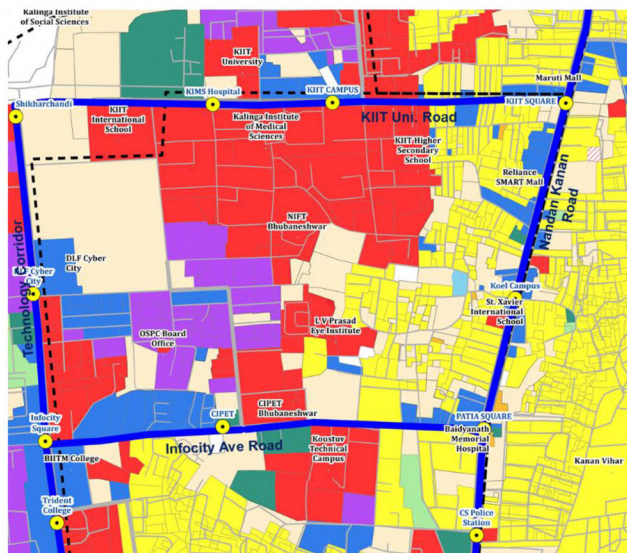


Source: Transit Network – Bhubaneswar One website

STEP 3 PT Network

The KIIT area is the institutional hub of the city and is well connected with PT network. The area has total 11 bus stops with major interchange facilities at KIIT square and Patia Square.

Average bus frequency is about 10-20min

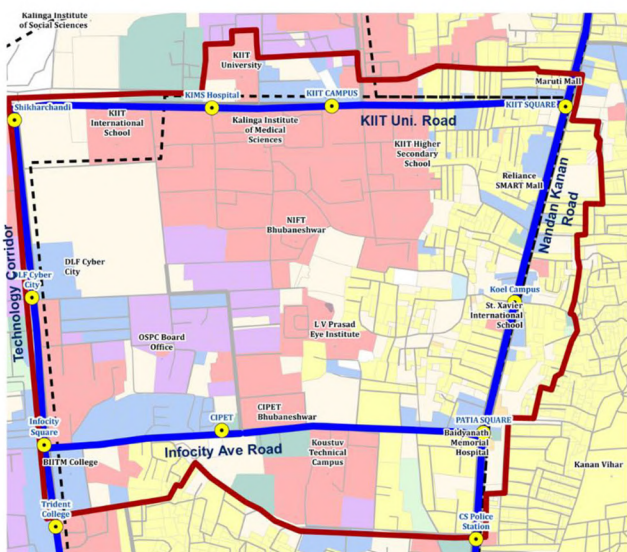


Source: Land Use – Primary Survey, 2021

STEP 4 Land Use / Built Use

Commercial along Nandankanan Road
Educational Hub of City
Industrial along Infocity Road
and Near KIIT Campus

33% of the area is institutional use followed by residential (22%), Commercial (12%) and Industrial (12%)



Source: Land Use – Primary Survey, 2021

STEP 5 PAMP Boundary

KIIT University Area - Educational hub of the city with well known schools and colleges namely KIIT university, KIIT school, CIPET, BIITM, NIFT etc. An area of 3.3 sq.km is considered as PAMP area.

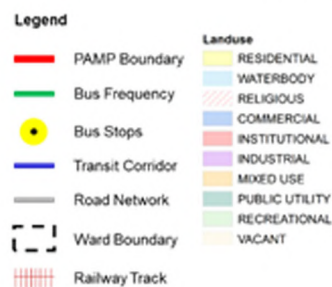


Figure 3 : PAMP area delineation - KIIT University Area

03 DATA COLLECTION

In line with the PAMP Toolkit section 3.2.3, primary and secondary data has been collected for the site. Details regarding administrative boundary, organizational structure for parking management, contracts for parking management, parking locations in the area, upcoming development and proposals have been collected as secondary data. The primary surveys were conducted in the month of February 2021.

Table 1 : List of secondary data collected

Sr no	Data Required	Purpose and data
1	Details of parking locations with parking charges	To know the existing supply in the area and existing parking charges List of parking locations in KIIT area https://www.bmc.gov.in/
2	Tender / Contract with parking management agencies for different parking locations including contract period, timeline, agency responsible	To understand the existing operations and parking management system adopted in the city. To understand roles and responsibilities of each agency, penalties levied etc.
3	Other documents / plans under consideration for technology improvement (ITS, AFC etc.)	To understand the upcoming developments in the area and steps taken by city authorities to manage the existing parking situation
4	Vending zones in the area Location of vending zones, no. of vendors accommodated, type of vending activity	To know the legalised vending zones in the area and land requirement for parking in the nearby areas
5	Roles and responsibilities of different agencies involved in parking planning, management, and operations Details on enforcement and regulations for parking in the area	To analyse gaps in the existing institutional setup for parking management To understand existing parking management system and propose improvements in terms of enforcement of rules and regulations Details regarding roles and responsibilities of different agencies was collected by discussing with BMC officials and from BMC website - https://www.bmc.gov.in/ Enforcement details have been discussed with Traffic police and data also received from website https://bhubaneswarcuttackpolice.gov.in/policestations/traffic/

Sr no	Data Required	Purpose and data
6	Information on vacant Government land	Land parcel on map with area and ownership was required in case of need for providing more parking supply in the area
7	Ward wise property tax information <ul style="list-style-type: none"> • Registered properties by different categories in each ward. • Non-residential properties by category and land area (sq. m) 	Data required for proposing parking charges as proposed in Parking Policy Bhubaneswar

Table 2 : Primary surveys conducted in KIIT University area

Sr no	Survey Type	KIIT University Area (Samples)	Details collected
1	Road Network Inventory	47.8 km	Carriageway width, availability of median and footpaths with width, presence of parking bays, encroachment details, availability of streetlights and abutting land-use
2	Land use & Built Use Survey	3.3 Sq.km	Information on abutting land use and built use- including building height, ground floor use and parking details
3	Parking Inventory & Registration Plate Survey	04 locations	Sample surveys on major roads in the area with non-residential abutting land use. Surveys were conducted at each location for 15 min duration in peak hour of a working day
4	Activity Surveys (Commercial Use)	100 samples	Samples from each of the built use category which is non-residential to assess trip attracted per day and mode used - Regular and visitors

04 SITUATION ANALYSIS

Based on the data collected and primary surveys, further analysis was carried out to understand the major issues and potentials from the parking perspective. It is observed that the NMT infrastructure (footpath and cycle track) are encroached by parked vehicles. Further, to analyse the parking situation in the area, detailed information was collected, and surveys were conducted at existing parking locations (parking bays) near the major activity centres in the KIIT University area.

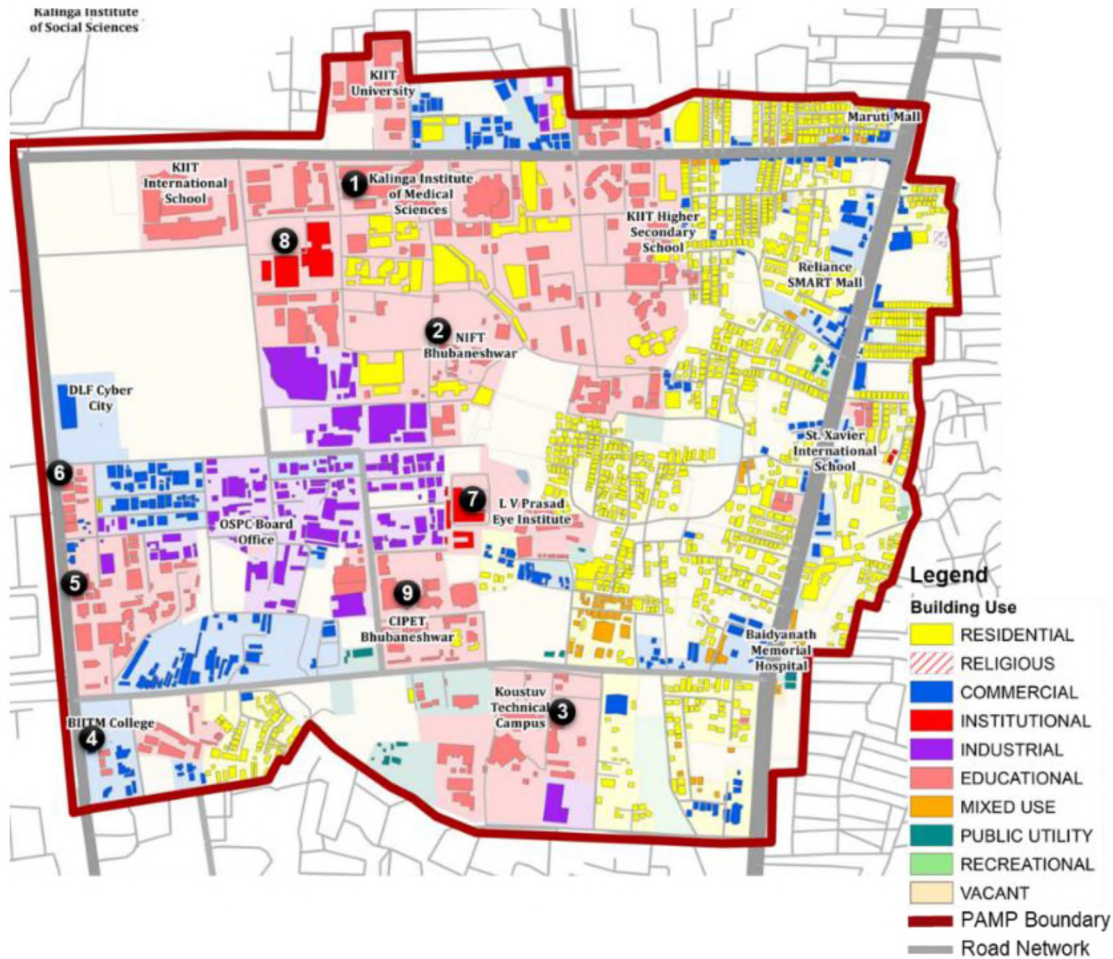
Table 3 : Data analysis for finalising strategy mix in PAMP

Sr no	Data Analysed	How it is used	Strategies
1	Overall parking demand in the area and along major corridors	It is used in analysing parking requirement in the area and efficiently allocating the road space for parking	Managing parking demand
2	Parking turnover and duration at activity centres (commercial, recreational etc.)	To understand short term/long term parking demand and vehicular composition at a particular location	1. Parking pricing based on short/long term parking, 2. Parking permit to prevent spill over 3. Street designing for efficient allocation of space for different modes
3	Impact of parking on PT and NMT other infrastructure facilities	To identify gaps in existing street designs in terms of faculties for NMT infrastructure the encroachment details and efficiency of existing enforcement regulations in the area	Street designing to manage parking and efficient allocation of space. Enforcement and regulation strategies
4	Reviews of existing institutional setup, roles and responsibilities specific to parking management	To understand and analyse gaps in existing setup.	Integrated setup for planning and implementation of PAMP in an area.

4.1 LAND USE AND MAJOR ACTIVITY CENTRES

Major activity centres in the area were identified to know the nature of activities and their parking requirement.

MAJOR INSTITUTES IN THE AREA



1 - KIIT University



2 - NIFT



3 - Koustuv Tech. Campus



4 - BIITM College



5 – USBM



6 – Srusti Academy



7 – LV Prasad Eye Inst.



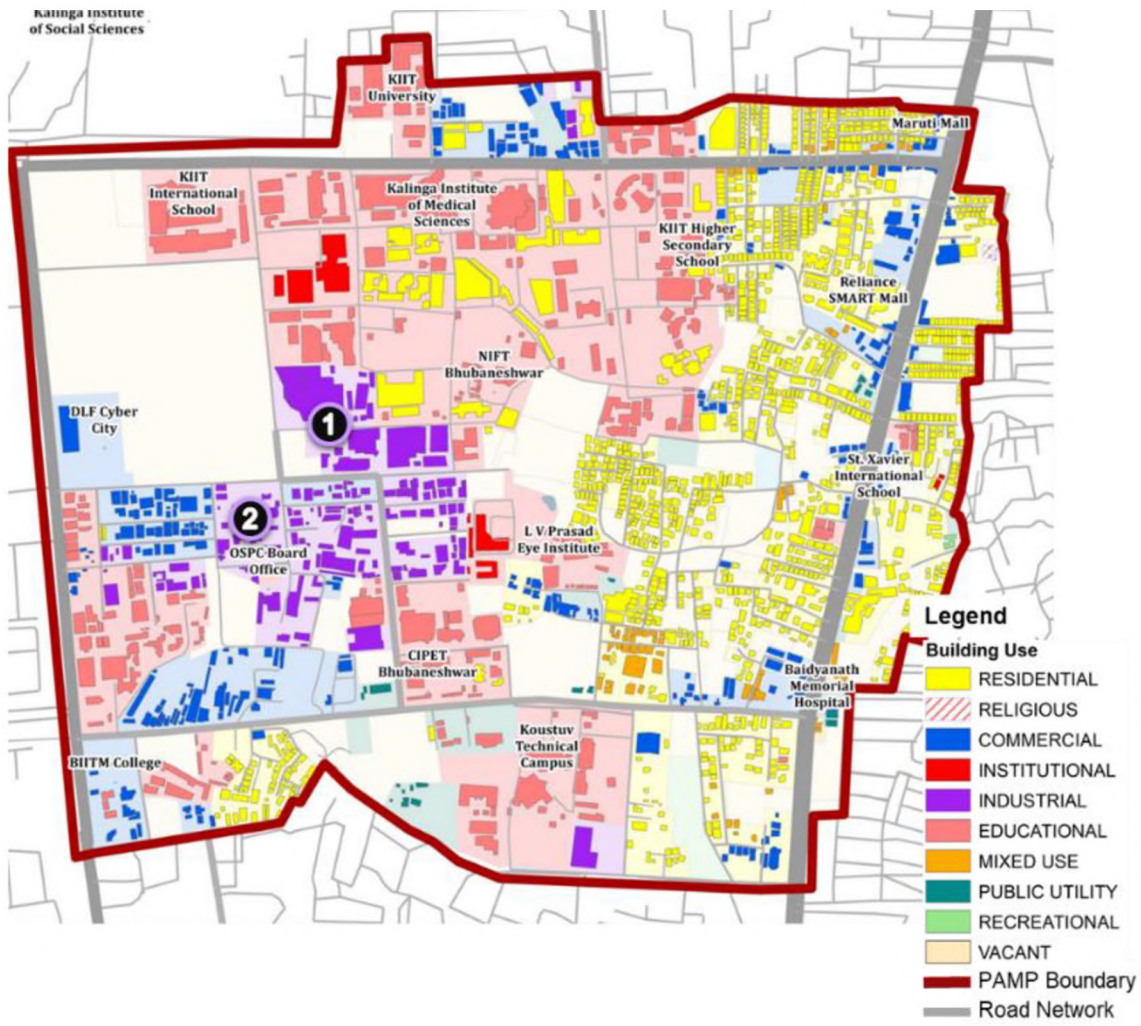
8 – KIIMs Hospital



9 – CIPET

Figure 4 : Major institutes in KIIT University area

MAJOR INDUSTRIES IN THE AREA

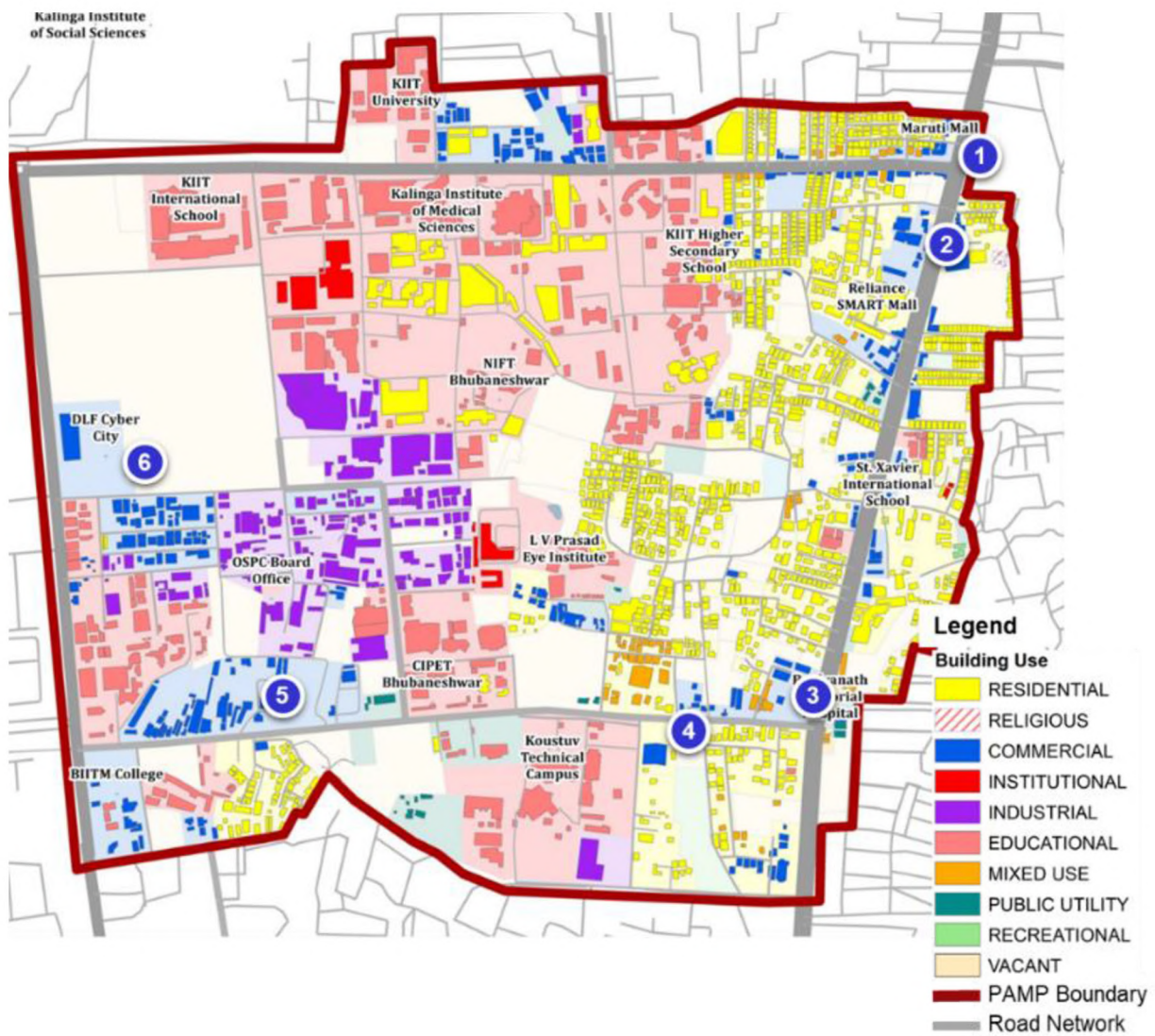


1 – Kurl-on Industry



2 – Lisa Plastics

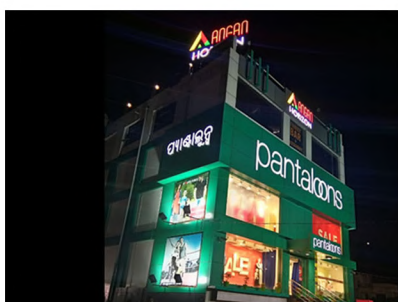
MAJOR COMMERCIAL BUILDINGS IN THE AREA



1 – Maruti Mall



2 – Reliance Mall



3 – Pantaloons



4 – Crystal Courtyard



5 – Food Plaza



6 – DLF Cyber city

Figure 5 : Major commercial buildings in KIIT area

Further, the type of building use and ground floor use along the major activity zones in the area were analysed. The residential plots in the area are mainly row houses with available parking spaces. Also, all the institutes have parking space within their premises while the commercial buildings do not have parking facilities and hence, they use road infrastructure for parking, leading to spillover on the roads.

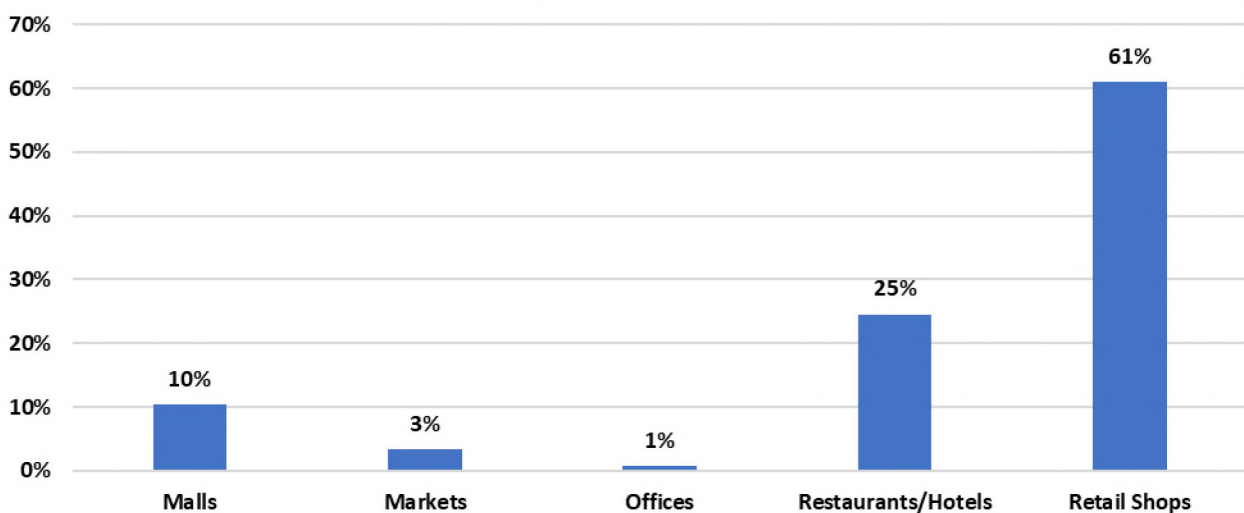
4.2 PARKING ANALYSIS

This section details out analysis of parking requirement along major commercial area. Analysis of authorised and unauthorised parking locations is done to understand the existing situation in terms of parking utilisation, occupancy, duration, vehicular composition, and pricing.

4.2.1 PARKING AT COMMERCIAL AREAS

Activity surveys were conducted by interviewing shop/ factory owners/ employees on a working day to know details about availability of parking, parking requirement and duration of a customer / employee, and freight vehicles. The area is dominated by institutional use (33%) and residential use (22%), with parking available in the respective premises. Commercial use is about 12% with majority of retail shops followed restaurants and malls.

Distribution of commercial activities in the area



Parking duration based on commercial activity

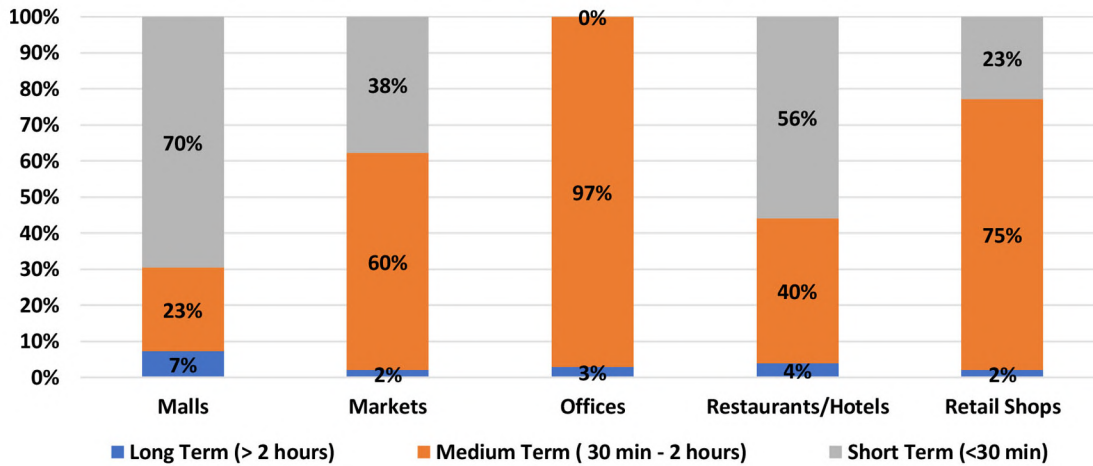


Figure 6 : Distribution and parking duration of commercial activities in the area
Source: Activity Survey, 2020

As per the survey, it was found that 96% of the people visiting the commercial areas occupy about 2600 ECS/day as parking, which is mostly medium-term (30 min–2 hours), 36 % require short-term parking (< 30 min) while the remaining 4% owners and workers have full-day parking requirement, occupying around 100 ECS.

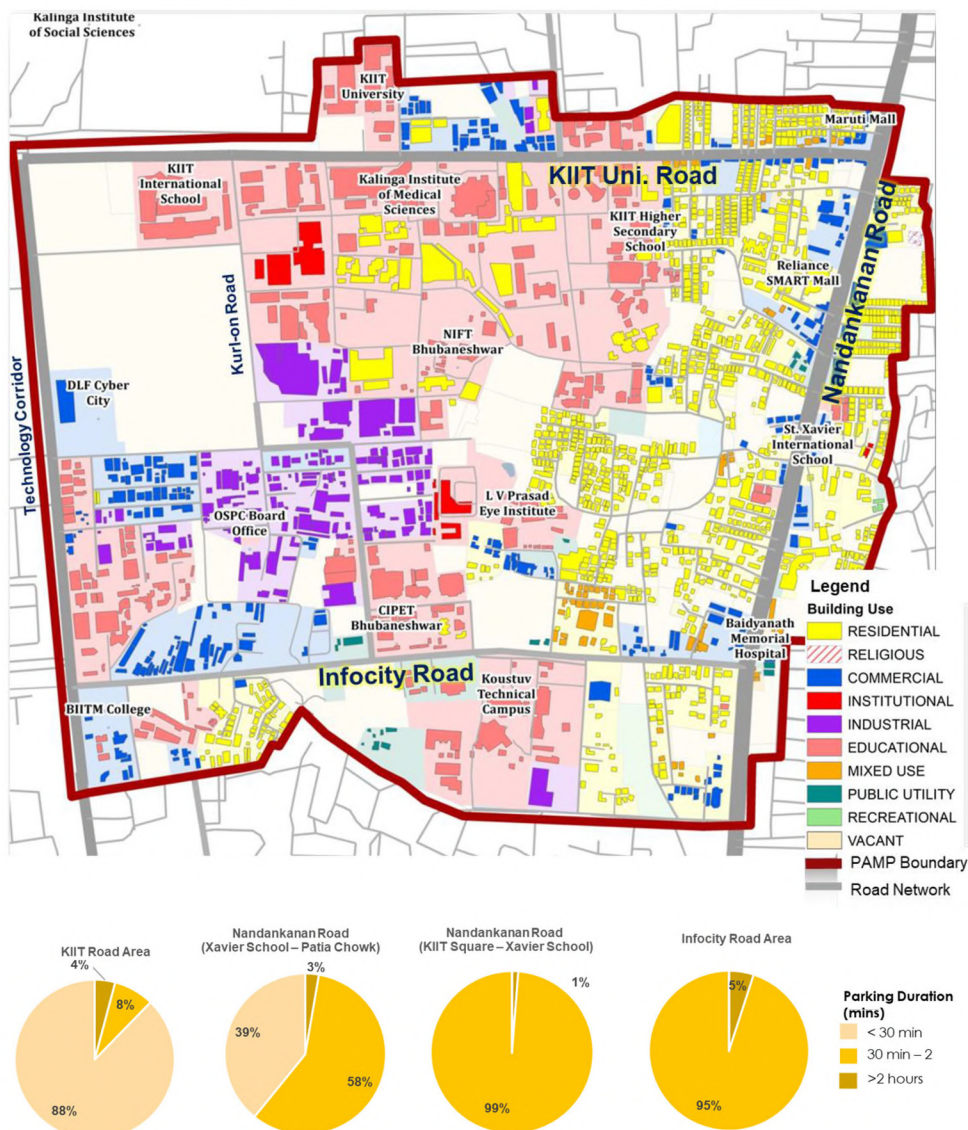


Figure 7 : Parking duration at commercial areas – KIIT area
Source: Activity Survey – Primary Survey, 2021

4.2.2 UN-AUTHORISED PARKING

Only 7% of the PAMP road network has RoW more than 36m and 11% of the roads are encroached upon by parked vehicles. Roads near KIIT University (RoW 24m) encroached upon by parked vehicles. Kurl-on road (RoW > 24m) is encroached by parked private and freight vehicles while roads near CIPET and LV Prasad Institute (RoW 15m) were encroached only by parked private vehicles.

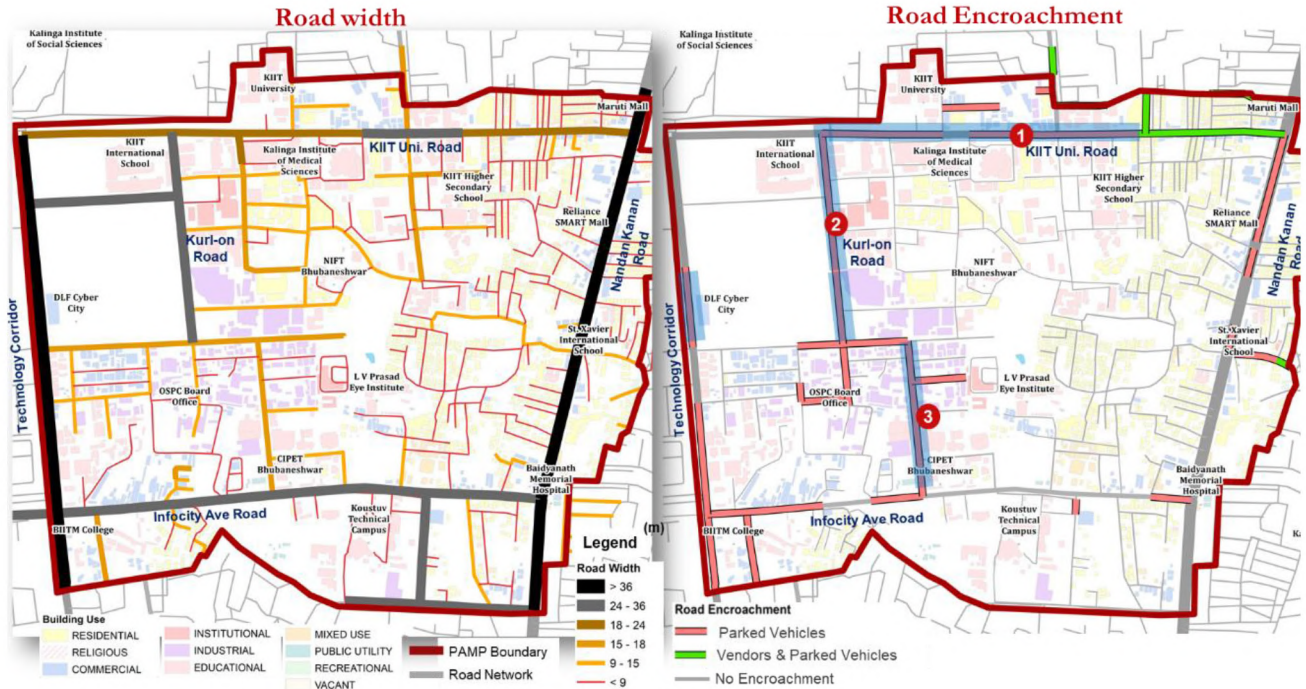


Figure 8 : Road width vs road encroachment – KIIT area

Source: Primary Survey, 2021

Table 4 : Road width distribution and encroachment

Road width (m)	Road encroachment (road length in km)			No encroachment (Road length in km)	Total road length (km)
	Parked vehicles	Vendors & parked vehicles	Total encroached		
< 9	0.2	0.0	0.2 (1%)	24.0	24.2
9–15	0.5	0.0	0.5 (5%)	9.6	10.1
15–18	0.8	0.0	0.8 (23%)	2.6	3.4
18–24	0.6	0.5	1.1 (62%)	0.7	1.9
24–36	1.9	0.0	1.9 (39%)	3.0	4.9
>36	1.2	0.0	1.2 (36%)	2.2	3.4
Total	5.3 (11%)	0.5 (1%)	5.8 (11.5%)	42.1	47.8 (100%)

It is observed that out of 47.8 km road network, only 12.4 km (26%) of the roads have footpaths in the area. About 26% of this 12.4 km are encroached upon and 17% encroachment is by parked vehicles. Around 76% of the footpaths with width > 3 m are encroached upon. Details of encroachment on KIIT University Road are:

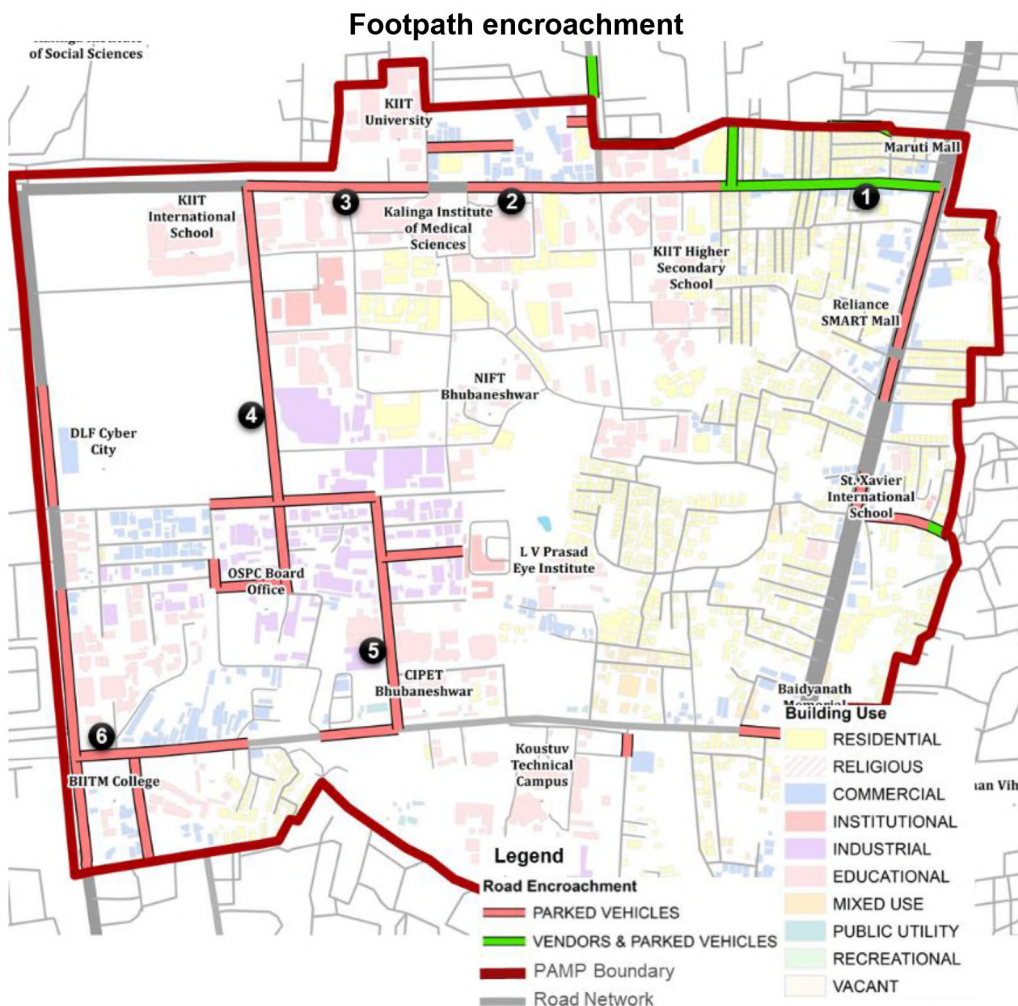
1. Footpaths with width > 3 m on KIIT road are encroached upon by parked vehicles.
2. Footpaths near entrance of KIIT University and Infocity are encroached upon by both parked vehicles and vendors.

There is an urgent need to improve the NMT infrastructure in the area to provide safe and sustainable mode of travel with last mile connectivity to the mass of students who through the area.

Table 5 : Footpath width distribution and encroachment – KIIT area

Footpath width (m)	Footpath encroachment (road length having footpath in km)				No encroachment (road length km)	Total road length with footpath (m)
	Parked vehicles	Vendors	Vendors & parked vehicles	Total encroached		
> 1.5 m	0.5	0.1	0.2	0.9 (7%)	4.5	5.4
1.5–3.0 m	0.5	0.1	0.4	1.0 (8%)	4.3	5.3
> 3 m	1.1	0.0	0.2	1.3 (11%)	0.4	1.7
Total	2.1 (17%)	0.2 (2%)	0.8 (6%)	3.2 (26%)	9.2(74%)	12.4 (100%)

Source: Primary Survey, 2021



Source: Site Reconnaissance Survey, 2021

Onsite photographs of the road sections in the area are presented in the figure below.



1 - Near KIIT Chowk (KIIT Road)



2 - Near KIIT University (KIIT Road)



3 - Nr. KIIT University (KIIT Road)



4 - Kurlon Road



5 - Nr. CIPET Bhubaneswar



6 - Nr. Infocity Square (Infocity Road)

Figure 9 : Footpath encroachment – KIIT area

4.2.3 AUTHORISED PARKING DETAILS

Registration plate surveys at an interval of 15 min duration for peak hour on a working day was conducted at the parking locations near Reliance mall and Big Bazar along Nandankanan road. Similar surveys for on street parking location along KIIT road were conducted for LCMP study in the year 2019 and has been utilised for analysing existing situation. The section details out parking demand in terms of turnover, parking duration and vehicle composition at each location. Institutional and industrial buildings have parking available in their campuses while freight parking for full-day is observed on Eye Hospital Road, Kurlon Road and Technology Corridor.

Table 6 : Parking Locations – KIIT area

S. No.	Location Description
Nandankanan Road (Off-Street Parking)	
1	Parking near Reliance Mall
2	Parking near Big Bazaar
KIIT Chowk to KIIT College (On-Street Parking) (Data from LCMP)	
3	KIIT Chowk to SBI Bank
3A	SBI Bank–KIIT College
Observed Freight Parking	
4	Kurl-on road
5	Technology Corridor

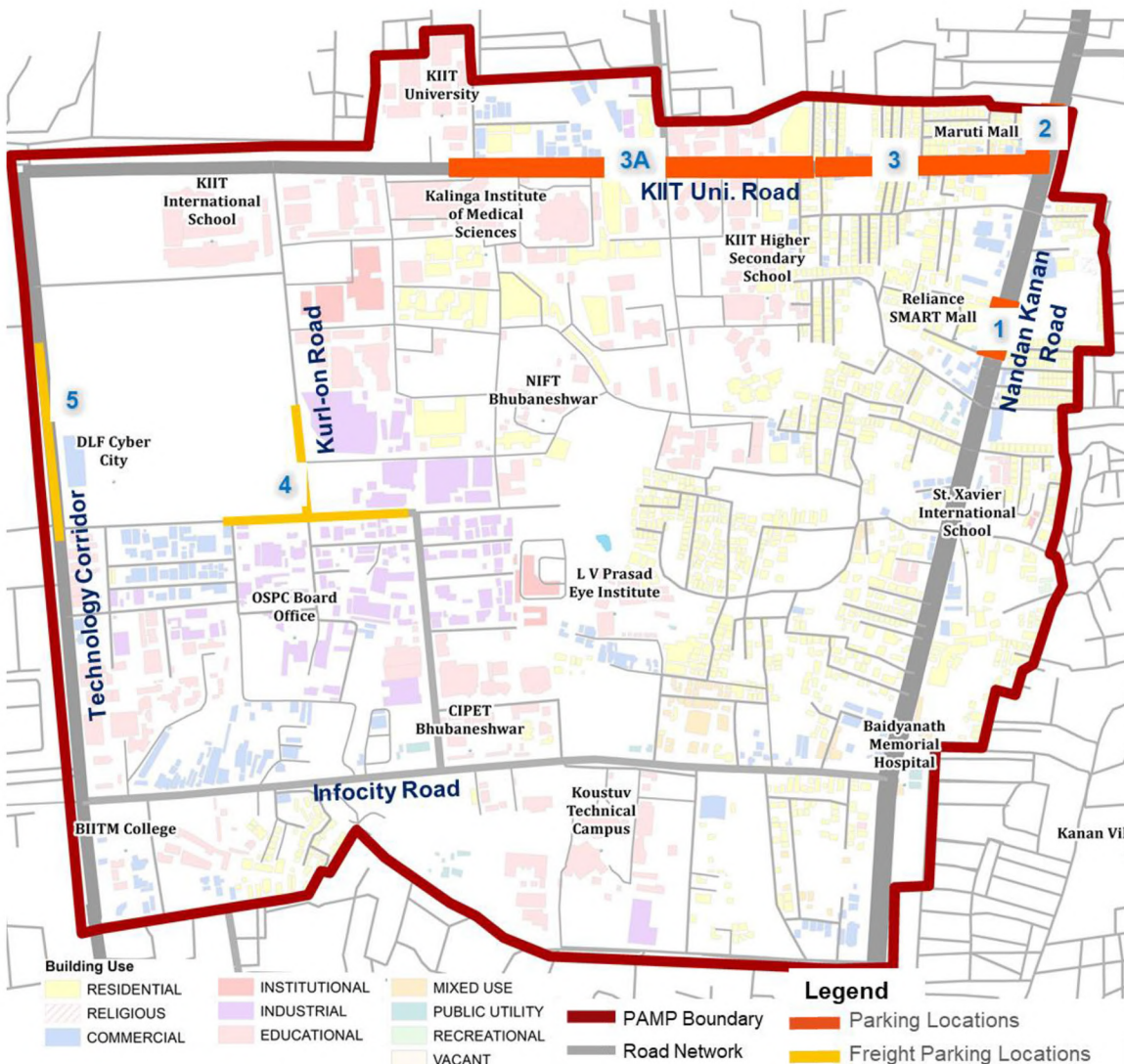


Figure 10 : Parking Locations – KIIT area
 Source : Parking locations, Bhubaneswar Smart City website

4.2.3.1 PARKING UTILIZATION AND DURATION

The parking areas are overutilized on the KIIT College Road (abutting institutional land use). The parking locations along Nandankanan Road (major malls in the areas) are also overutilized. The average duration of parking in the area is around 45 min; the majority of the vehicles near malls are parked for 30 mins to 2 hours while along KIIT College Road, a majority of the parking is done for short-term i.e. < 30mins. Heavy freight vehicles are parked for full day along Technology Corridor and Kurl-on Road.

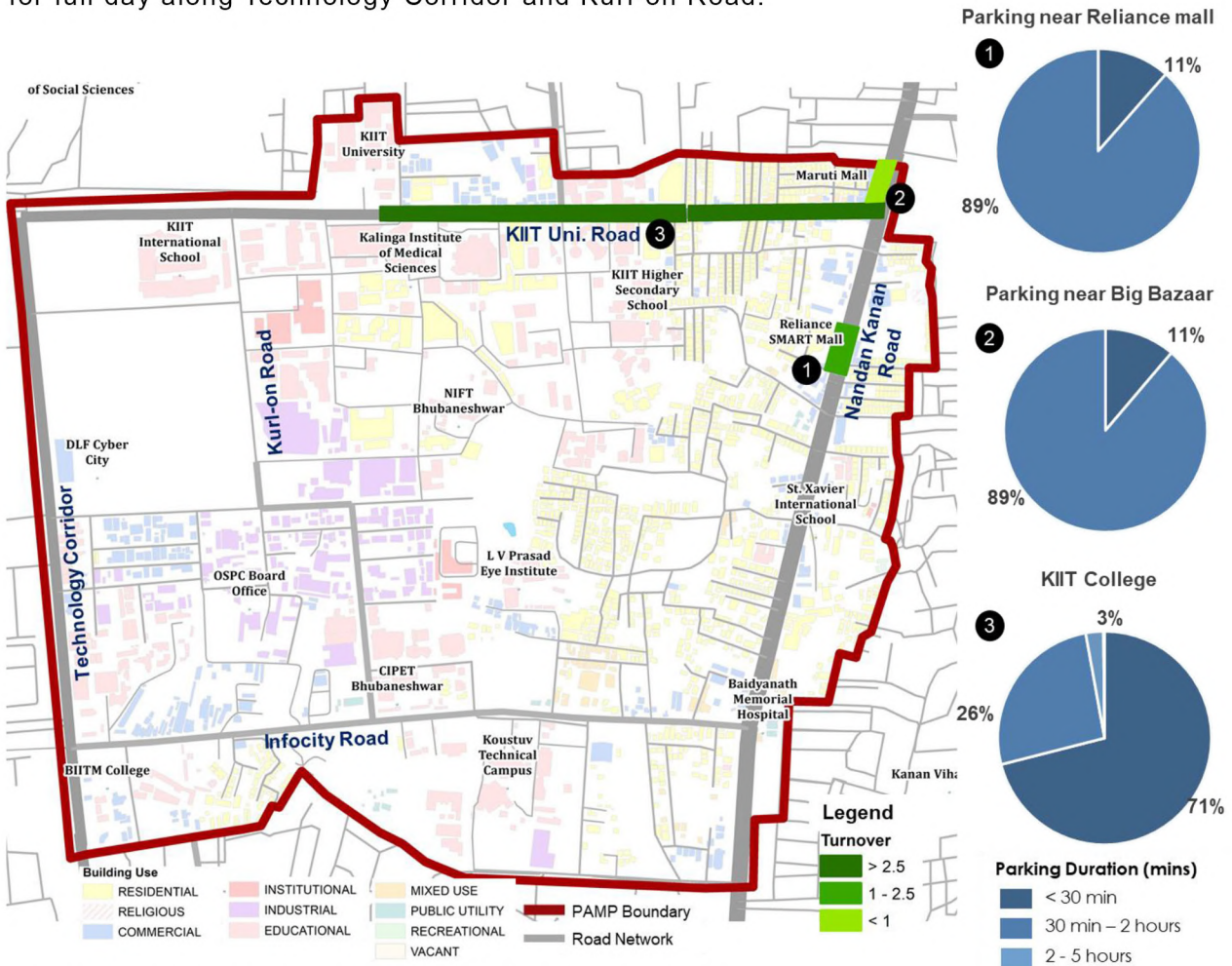


Figure 11 : Parking utilization and duration – KIIT area
 Source : Parking Data – Primary Survey, 2021 & Parking Data from LCMP, 2019

More short-term parking happens on the KIIT College Road. The peak hour near KIIT University parking locations is 5:00–7:00 pm.

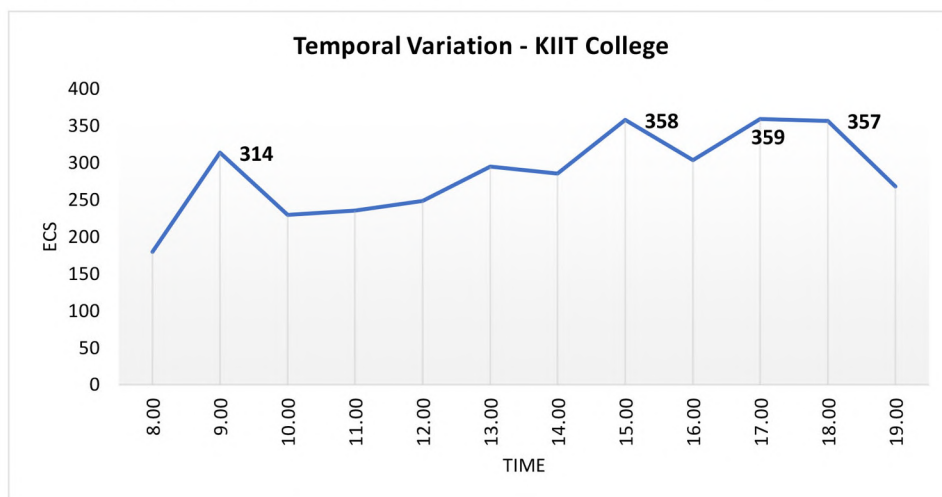


Figure 12 : Temporal variation – KIIT area

4.2.3.2 VEHICULAR COMPOSITION AT PARKING LOCATIONS

The vehicular composition at major parking locations in the area are presented below. It can be observed that near the malls along Nandankanan Road, two-wheeler parking dominates most of the commercial areas with over 60 % share. However, near the KIIT College area the proportion of 2W is slightly higher. The proportion of parked IPT vehicles are almost the same at all the locations. The share of parked autorickshaws is around 15 % in all the areas.

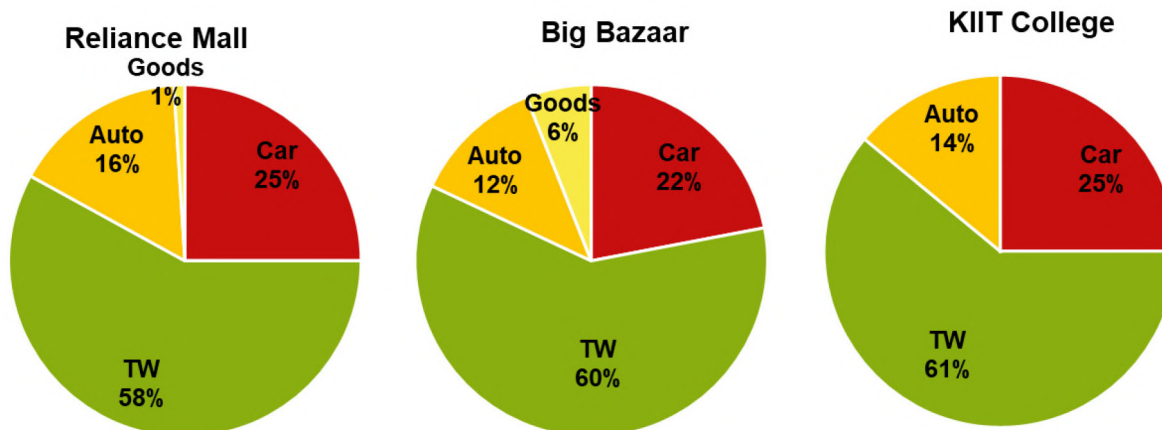


Figure 13 : Vehicle composition – KIIT area

Source: Parking Data – Primary Survey, 2021 & Parking Data from LCMP, 2019

4.2.3.3 PARKING CHARGES

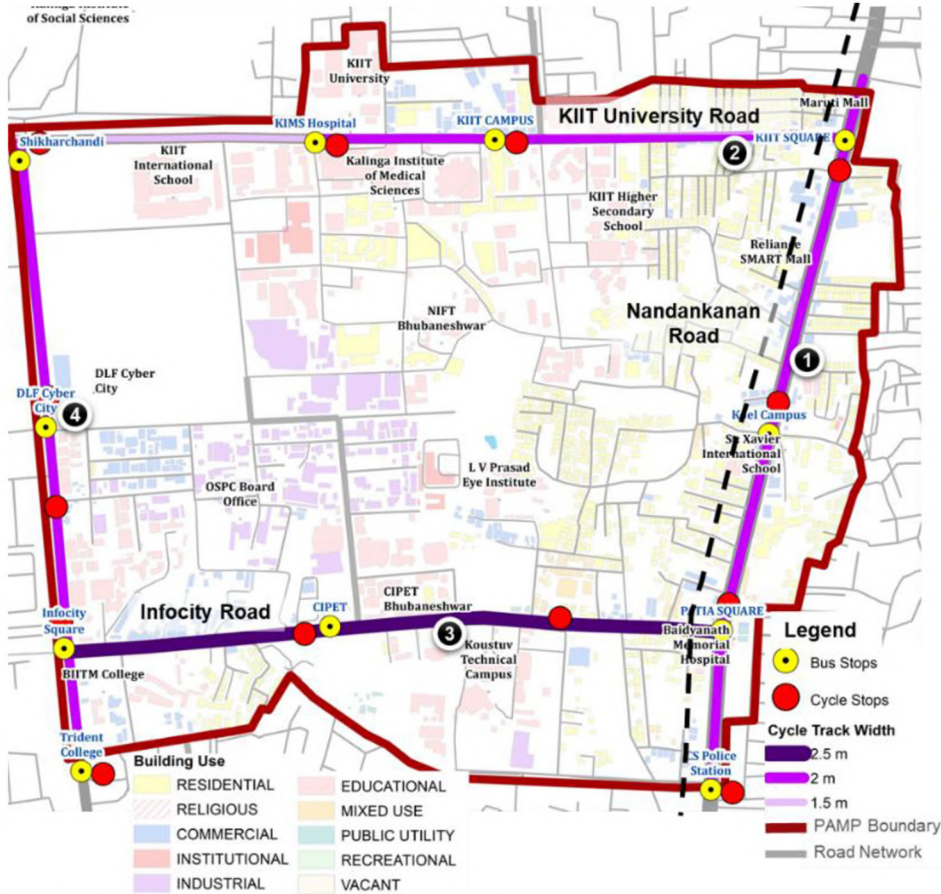
The minimum rate for 0–2 hours for 2W is INR 5 and for car it is INR 20. The BMC provides 40% discount for electric vehicles and no parking charges for cycles. The authority has also reserved 10% of the total parking area for NMT at Unit 1 parking and 5% at other areas.

Table 7 : Existing parking charges in the area

Hours	2-Wheeler	Auto Rickshaws	Cars/LCVs	Trucks/MAVs
	Base rate in INR			
0–2 hours	5	5	20	25
2–3 hours	15	20	40	50
3–4 hours	25	35	60	75
4–5 hours	35	50	80	100
> 5 hours	extra Rs. 20 for every hour			

4.2.4 WALKING AND CYCLING INFRASTRUCTURE

It is observed that a total of 25% (12 km) of the road network have footpaths, of which only 40% are in good condition. Only 15% (8.3 km) of the network along all major roads has cycle tracks of which segregated cycle track (about 1.8 km) is only available along the Nandankanan Road. PBS stops are available at each bus stop (12 locations). Internal road lacks NMT facilities and PBS stops.



Source: Road Network Inventory – Primary Survey, 2021



1 – Nandankanan Road



2 – KIIT University Road



3 – Infocity Road



4 – PBS stop near Cybr City Bus Stop

Figure 14 : Existing NMT facility details, KIIT University area

All the major roads have good lux level with streetlights available on both sides. Around 16 km of the road network needs its lux level to be improved.

The details of streetlight provision as per Street Design Guidelines for Bhubaneswar, 2017 are:

Road Width (m)	Streetlight
< 9 m	One Side
9–18 m	Both Sides
18–30 m	Median & Both Sides
> 30 m	Median & Both Sides + On Multi-Utility Zone

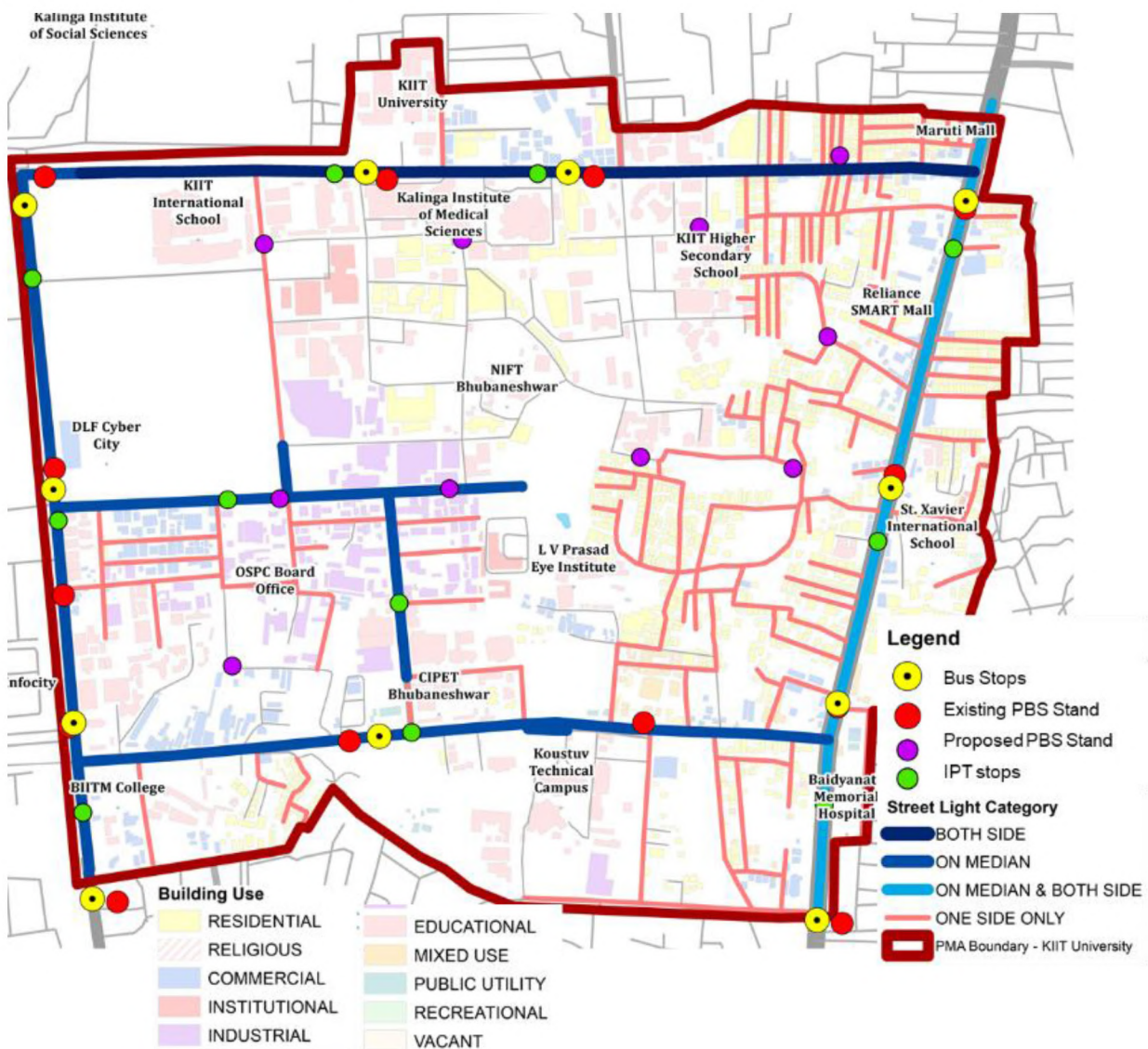


Figure 15 : Street light details in KIIT University area

4.3 INSTITUTIONAL SET-UP AND ENFORCEMENT DETAILS

Bhubaneswar city is divided into three zones for administrative functioning - North Zone, South West Zone and South East Zone. KIIT University PAMP area falls under ward no. 1, 2, 3 and 6 of North Zone. The institutional setup and roles and responsibilities of parking management authorities in the city was discussed with BMC officials.

4.3.1 ORGANIZATION DETAILS OF THE BHUBANESWAR MUNICIPAL CORPORATION

The Bhubaneswar Municipal Corporation (BMC) is responsible for undertaking work in various fields and is the principal provider of services to provide a better quality of life to the residents of Bhubaneswar.

Existing Institutional Arrangement

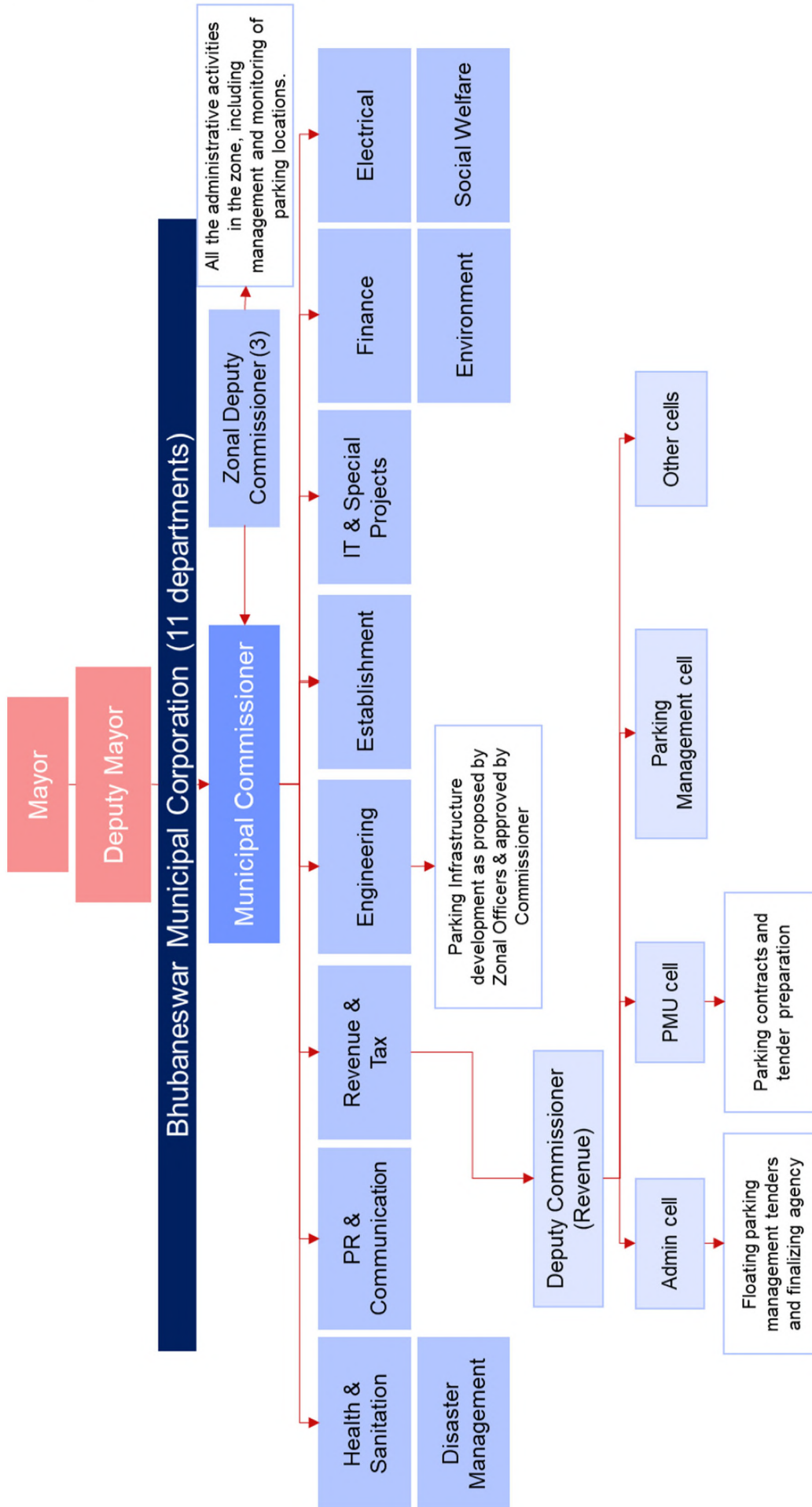


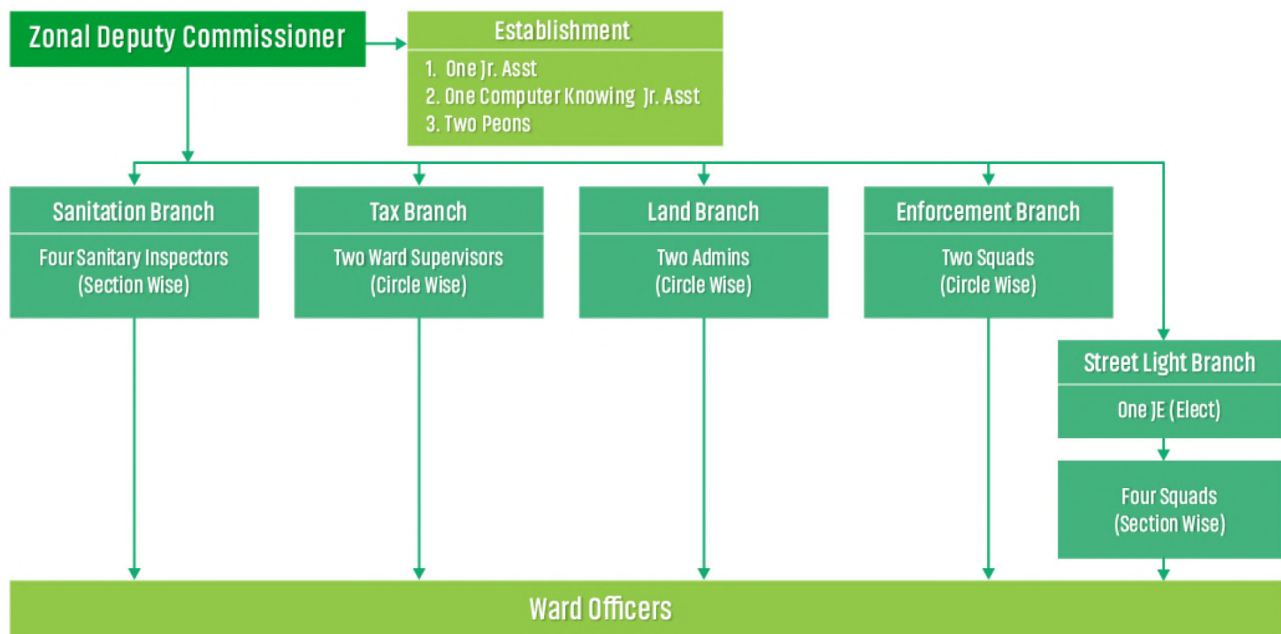
Figure 16 : Organizational details of parking management in Bhubaneswar

Source: <https://www.bmc.gov.in/>

The parking contract management and tendering is done by the Parking Management Cell under approval of the Dy. Commissioner, Revenue and Tax Department. The procedure of tendering and contract finalization is done by the administration cell with approval of the Dy. Commissioner and work orders are issued by the BMC HQ with the approval of the Commissioner.

The Engineering department of the BMC develops the parking lot areas as suggested by the Zonal officers and approved by the Municipal Commissioner.






Once the work order is done, the management and monitoring of the parking is done by the Zonal officers. The Zonal Deputy Commissioner is responsible for all the administrative activities in the zone and report directly to the Commissioner.



4.4 ISSUE IDENTIFICATION IN THE AREA

As discussed in PAMP Toolkit, this section details the issues related to the parking infrastructure supply, parking demand, parking management and enforcement.

Table 8 : Identified issues for KIIT University area

CLASSIFICATION	ISSUES
 <p data-bbox="256 669 445 728">Infrastructure Provision</p>	<ul style="list-style-type: none"> • Absence of organized parking infrastructure in the area leading to haphazard on-street parking and parking spillover. • Under supply of parking along KIIT University Road. • Absence of signages and wayfinding near bus stops.
 <p data-bbox="217 987 475 1046">NMT Infrastructure & Lux Level</p>	<ul style="list-style-type: none"> • Only 34% of road network have footpaths • Footpaths are encroached by vendors and parked vehicles. • Inadequate provision of cycle tracks • Inadequate streetlight/ low lux level on internal roads.
 <p data-bbox="276 1288 451 1317">Enforcement</p>	<ul style="list-style-type: none"> • Enforcement is done only by the traffic police and lacks strict regulations • No rules and regulations for freight movement in the area.
 <p data-bbox="240 1559 467 1588">Parking Demand</p>	<ul style="list-style-type: none"> • 96% trips for commercial area visitors require short- to medium-term parking.
 <p data-bbox="165 1812 608 1874">Institutional, Parking Management and Pricing Issues</p>	<ul style="list-style-type: none"> • Lack of coordination between parking management contract and parking enforcement agency. • Need for revision of parking charges to manage the existing parking demand.

05 PAMP – KIIT UNIVERSITY AREA

5.1 OBJECTIVE OF PAMP

The objective and strategies adopted have been discussed and finalised in consultation with the key stakeholders. The main objectives of PAMP for KIIT University area are:

1. Promote PT and NMT usage by improving existing infrastructure in the area
2. Provide good PT and NMT connectivity to the institutional buildings and markets in the area
3. Provide strategies for better parking management and improve enforcement in the area.
4. Provide strategies to regulate freight circulation and manage loading/unloading activities

5.2 STRATEGIES FOR PARKING MANAGEMENT

The KIIT University area is the institutional hub of the city with good connectivity of public transport to all parts of the city. Hence, the PAMP strategies focus on demand management. Taking good public transport connectivity as an approach to limit the parking in the area, a moderate approach is adopted by reducing the parking supply by 75 % and using pricing as a tool to reduce parking demand. This will be further supported by robust pedestrian and NMT infrastructure in the area to make last mile connectivity seamless.



5.3 DEMONSTRATION PLANS

5.3.1 PARKING PLAN

Under consideration of the Parking Policy and Street Design Guidelines following measures are planned for parking management:

- No parking within 50 m from major junctions and 30 m from minor junctions (as per the Draft Parking Policy)
- No parking within 50 m from bus stops
- No parking near schools and institutes
- No parking on roads with width < 9 m (as per Street Design Guidelines for Bhubaneswar, 2017)
- Pay and Park with high charges on transit corridor and road with RoW > 15 m

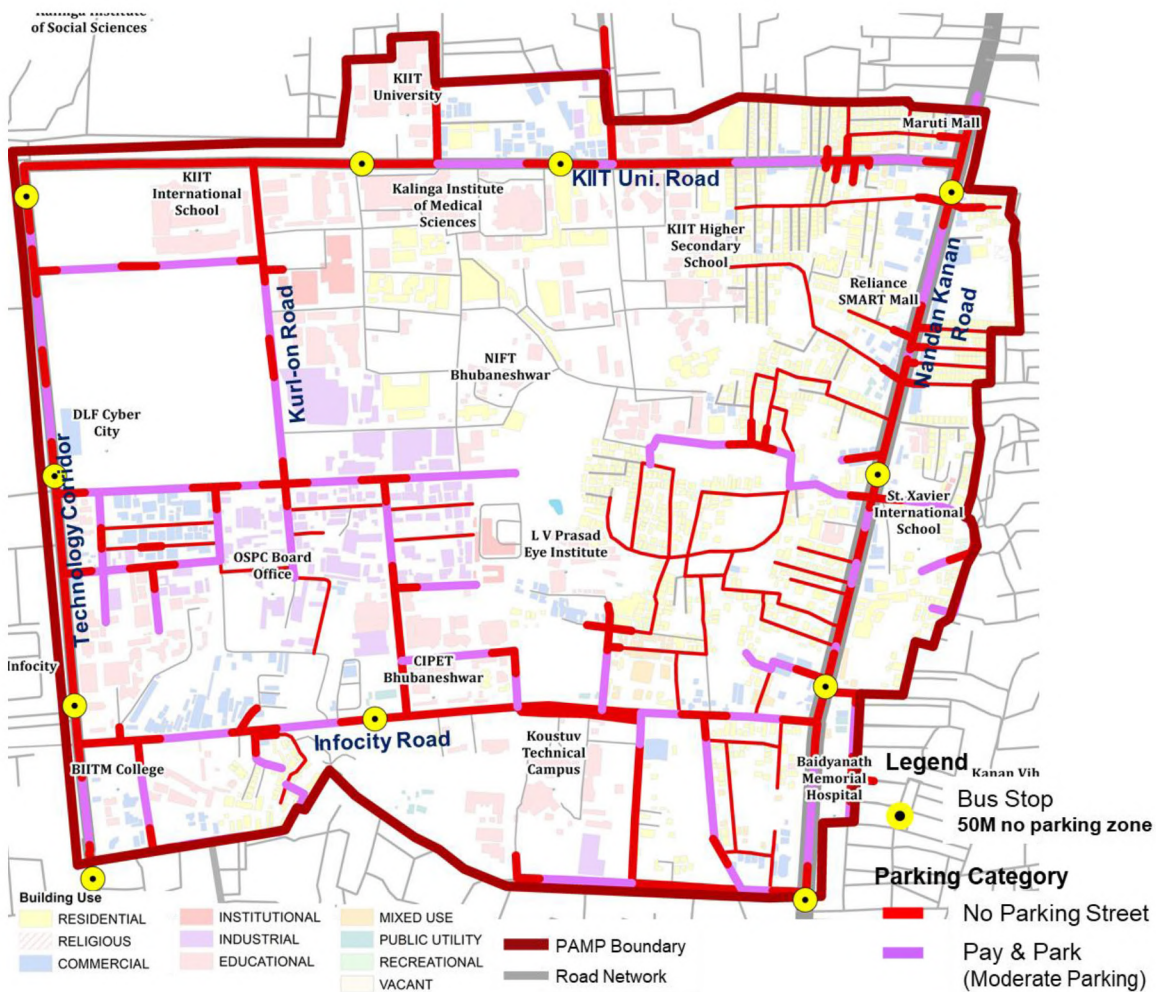


Figure 17 : On street parking strategy plan

Parking facility to be provided on one side or both sides of the road has been detailed out based on the Street Design Guideline for Bhubaneswar, 2017.

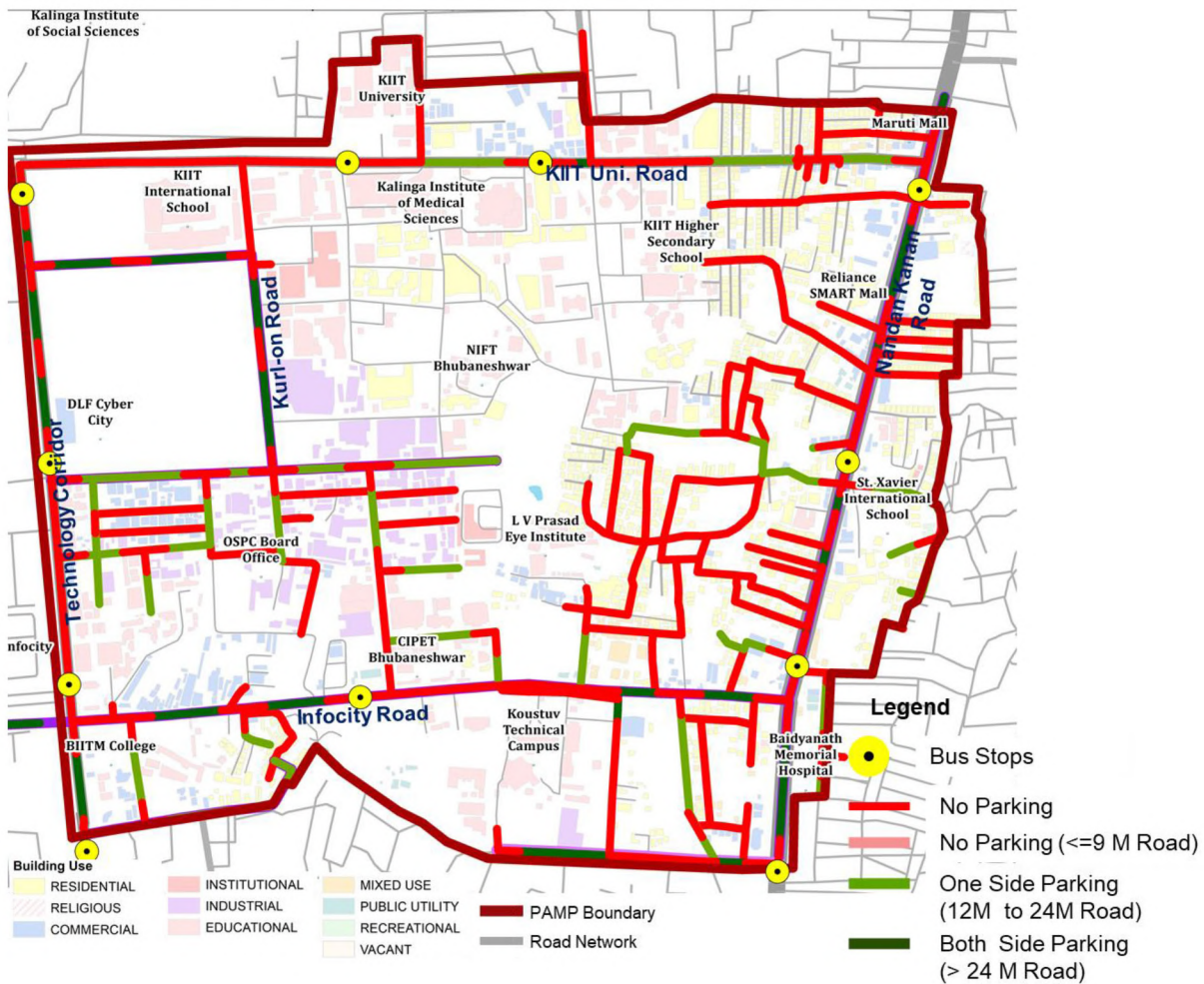


Figure 18 : On street parking strategy based on road width

The parking details include parking supply in the area in terms of ECS along each corridor. Various assumptions for calculating the ECS are:

- No parking – RoW < 9 m; Only one parking – RoW 12 to 24 m; Both Sides parking – RoW > 24 m (as per Street Design Guideline for Bhubaneswar, 2017).
- No parking for private modes near schools, universities, colleges, and hospitals.
- Only freight parking on Technology Corridor and Kurl-on Road.
- Vehicle composition considered from primary surveys.
- Parking bays for disabled people and pregnant women to be available on major corridors, near market areas/malls/institutes.

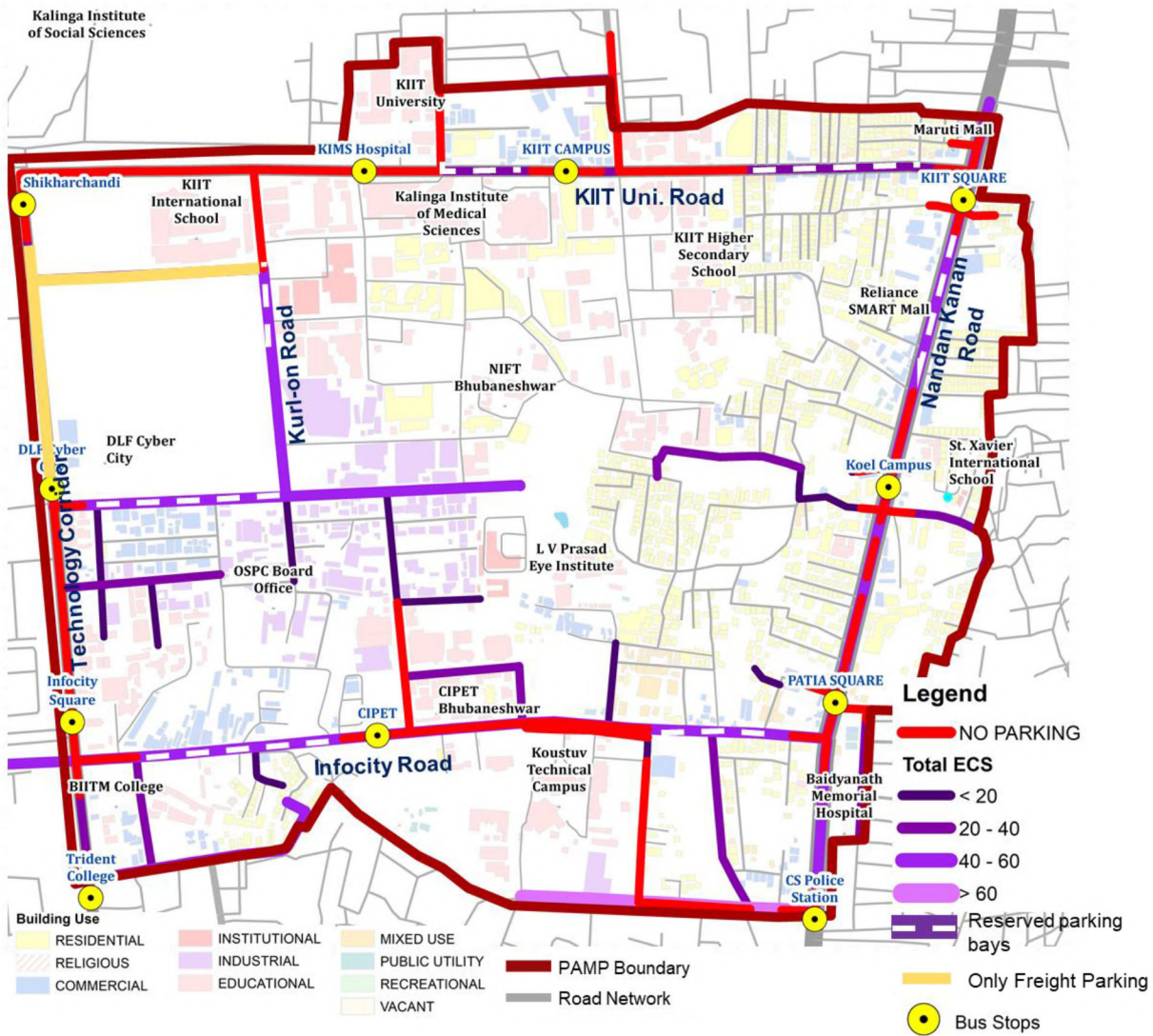


Figure 19 : Proposed parking ECS details in KIIT University area

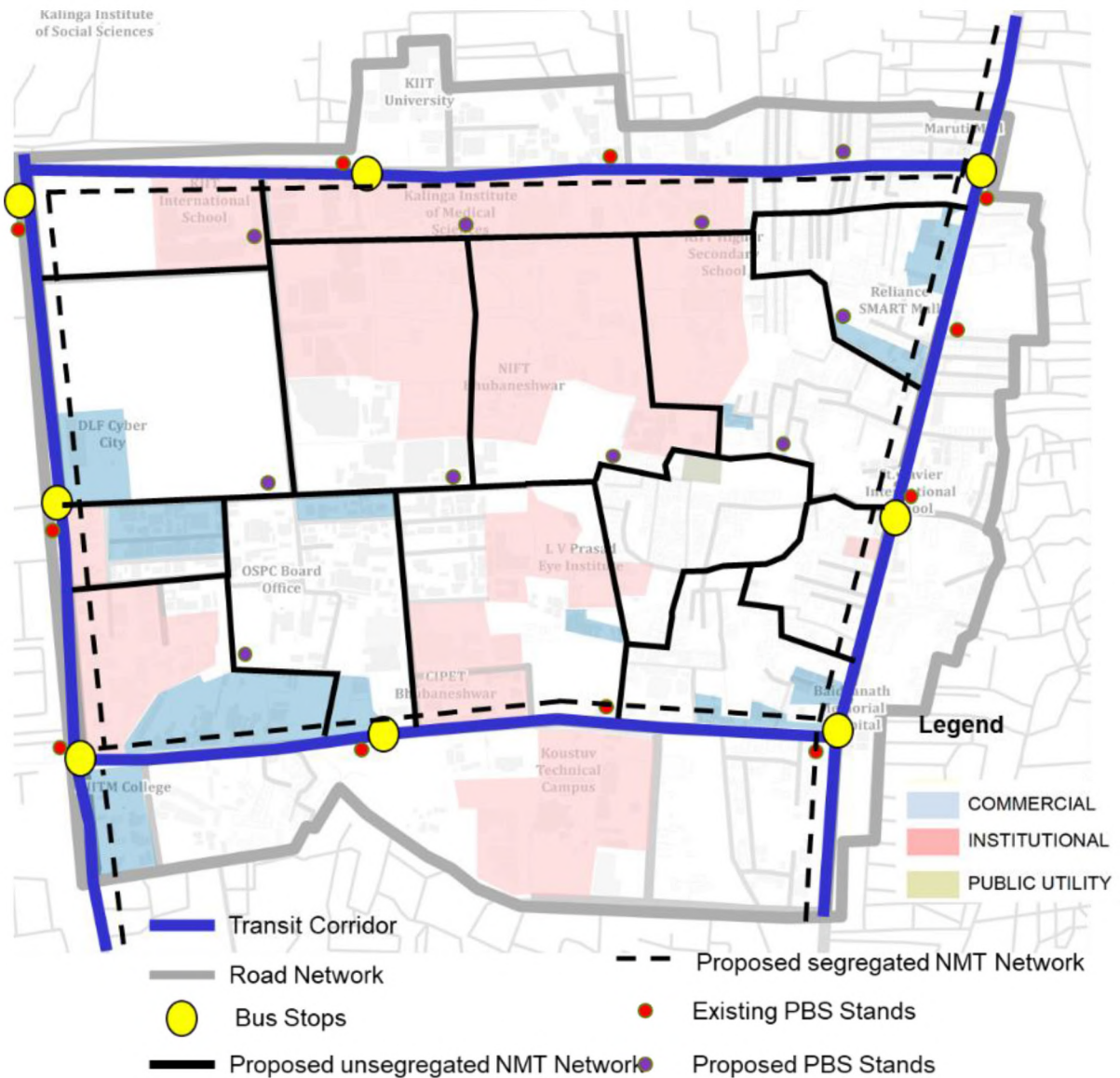
Table 9 : ECS on major corridors, KIIT University area

Road Name	ECS (Equivalent Car Space: Area = 5m * 2.5m)					Total
	Car (1 ECS)	Two-wheeler (0.25 ECS)	Cycle (0.10 ECS)	Auto-Rickshaw (0.5 ECS)	Freight (LCV = 1; HCV = 2.2)	
Nandankanan Road	11	11	2.8	25	0	50
KIIT Road	4	4	2.1	17	0	27
Technology Corridor	0	0	2.1	0	40	42
Eye Hospital Road	24	24	1.4	4	0	53
Kurl-on road	22	22	0.70	0	0	45
Sai School Road	2	2	0	4	0	8
Info City Road	24	24	1.4	8	0	57
DLF Cyber City Road	0	0	0	0	48	48
Police Station Road	32	32	0	0	0	64
Other roads	200	200	4.2	25	0	429
Total	319	319	15	84	88	824

5.3.2 NMT PLAN

The NMT plan for the area has been prepared to provide last mile connectivity to the nearby transit stops and promote usage of the PT system in the area. The various steps involved in preparing the NMT plan are:

- Identifying clusters of different activities like schools, colleges, markets, event centers, malls, etc.
- Connecting all the activity centers to the nearest transit stop to provide last mile connectivity.
- Creating loops to provide nearest option to reach the destination and completing the NMT network by completing missing links between loops and clusters.
- Proposing PBS stops, tentatively at every 400 m on the network.



PROPOSED CYCLE TRACK AND PBS STOPS

Cycle track on major roads needs to be segregated to reduce conflict with other vehicles. New cycle track with lane marking on the internal roads and segregated cycle tracks on major roads is proposed. About 12 PBS stops are already existing near the transit stops while 10 new PBS stands are proposed along a 16.3 km of the cycle track in the area near schools, colleges, market and malls.

Table 10 : Details of proposed cycle track in KIIT University area

Cycle Track Width (m)	Road Length (km)		Grand Total
	Painted	Segregated	
1.8–2	7.9	-	7.9
2	-	3.0	3.0
2.5	-	0.7	0.7
3	-	4.6	4.6
Grand Total	7.9	8.4	16.3

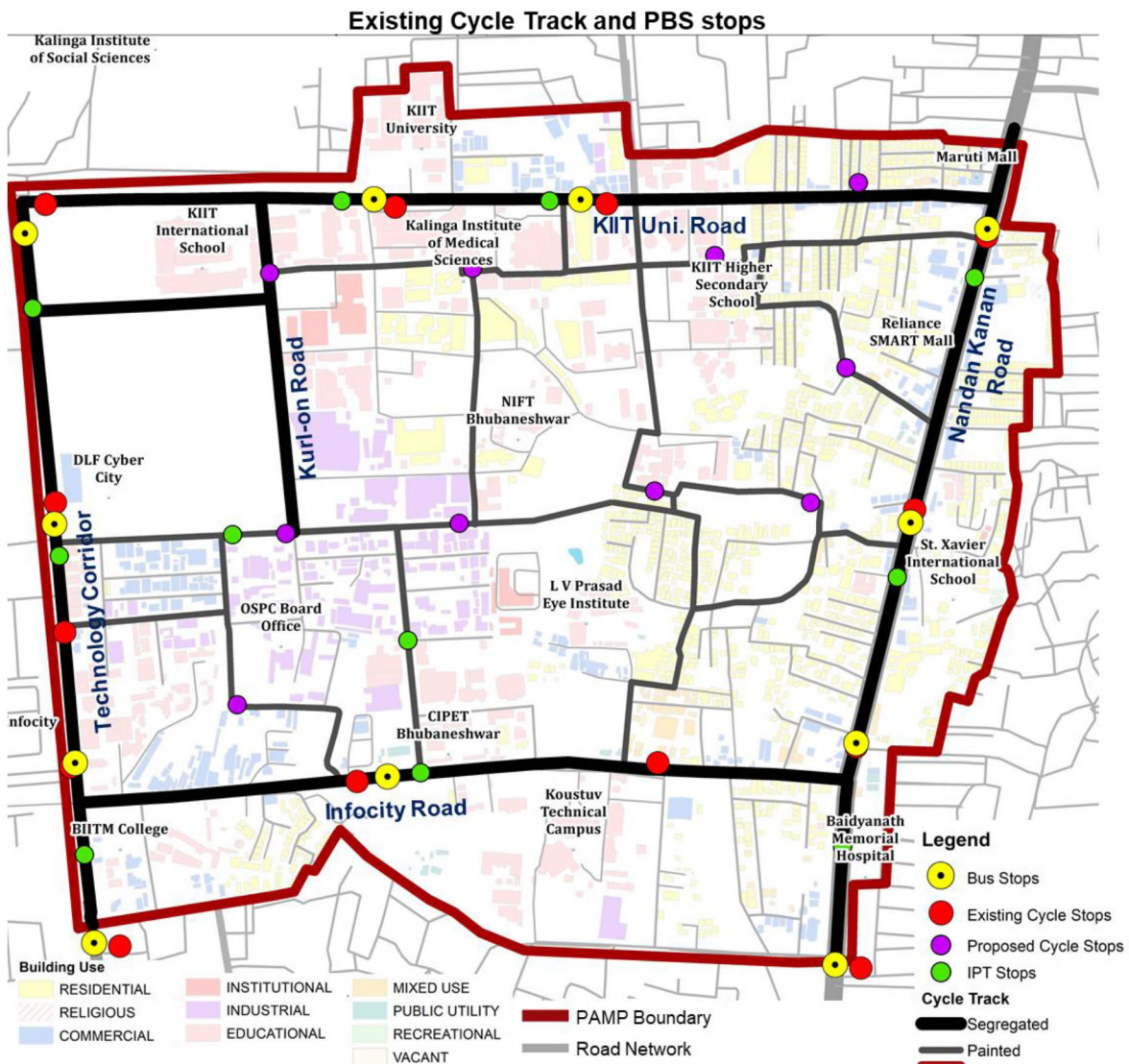


Figure 20 : Existing cycle track in KIIT University area

Proposed Cycle Track and PBS stops

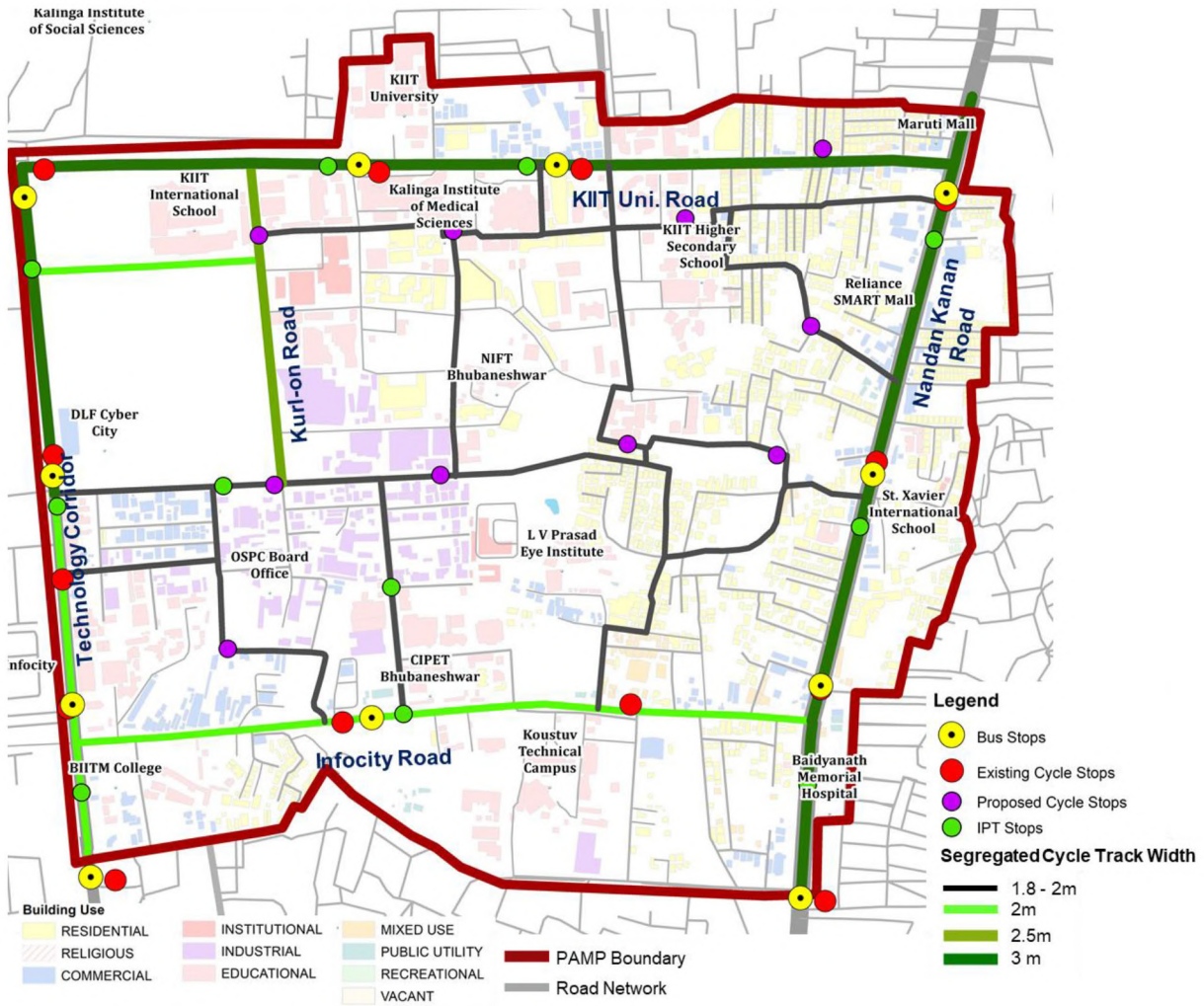


Figure 21 : Proposed cycle track in KIIT University area

FOOTPATH IMPROVEMENTS

Footpaths are proposed (18.6 km) on all the internal roads with RoW > 9 m for better accessibility in the area. About 7.7 km of existing footpaths needs improvement; in fact footpaths on all the major roads need improvement. Footpaths are not proposed on roads with RoW < 9 m (as per Steet Design Guidelines for Bhubaneswar, 2017).

Table 11 : Footpath details and improvements required in KIIT University area

Footpath Width (m)	Road Length (km)			
	Existing		Proposed Footpath	Total
	Good Condition	Needs Improvement		
1.8–2 m	1.9	2.3	15.8	20.0
2–3 m	1.8	2.1	1.1	5.0
> 3 m	0.0	3.4	1.7	5.1
Grand Total	3.8	7.7	18.6	30.1

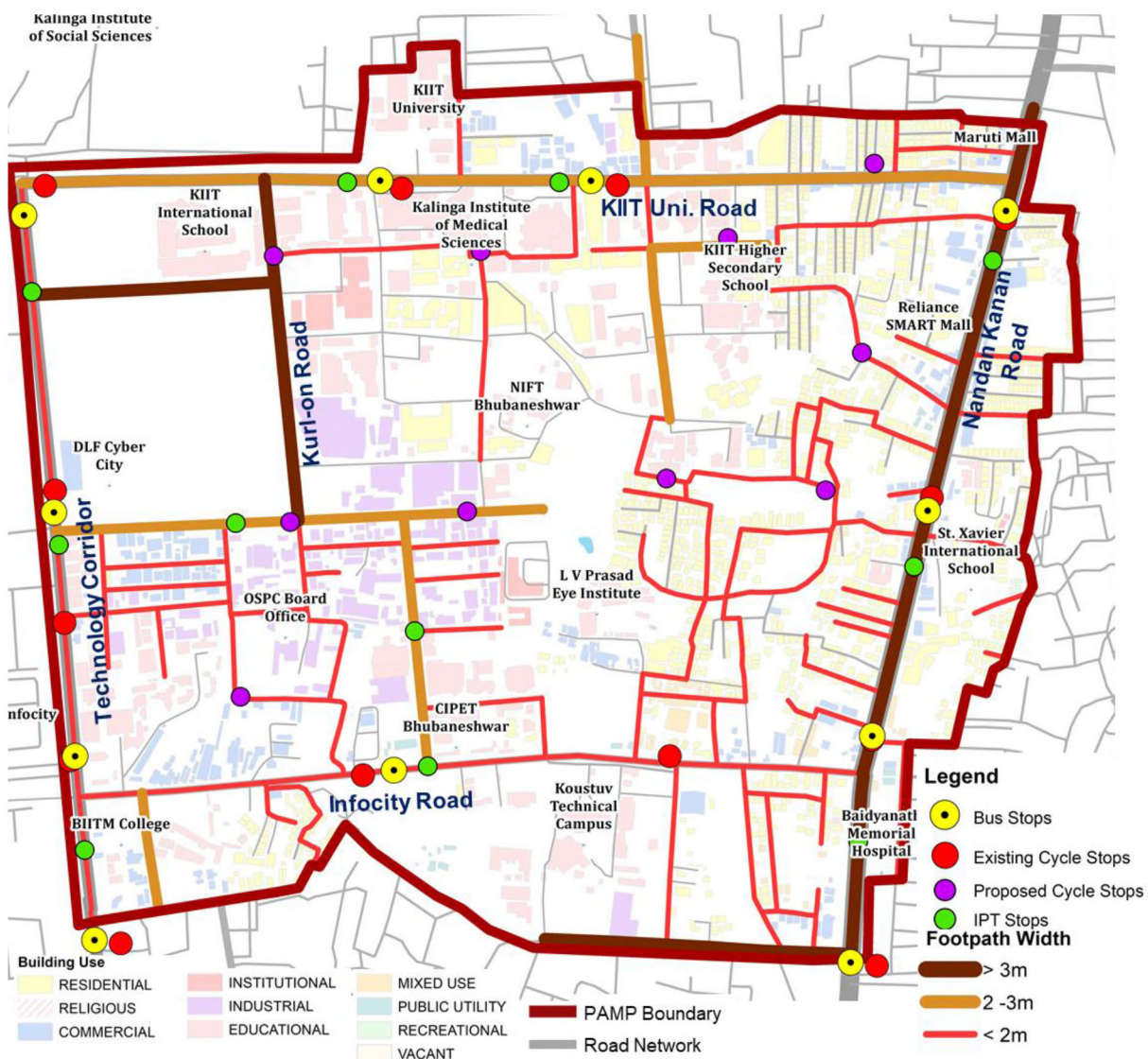


Figure 22 : Proposed footpath improvements in KIIT University area

5.3.3 FREIGHT MANAGEMENT PLAN

Currently, freight movement is allowed on all the major roads including the KIIT College Road and Sai School Road (major institutional roads) which is a safety hazard for the students in the area. As the area is an institutional hub of Bhubaneswar city, it becomes necessary to improve the safety aspect of the environment in the area. Hence, restriction of freight vehicles along institutional roads is necessary. The strategies to manage freight movement are:

- Restricted on KIIT Road
- Entry only on Infocity Road
- One-way movement on Eye Hospital Road and SAI School Road
- Freight parking (MAVs) to be provided on Technology Road – long-term parking (> 5 hours)
- Only loading/unloading – short-term parking (< 1 hour) Eye Hospital Road, Kurl-on Road and Sai School Road

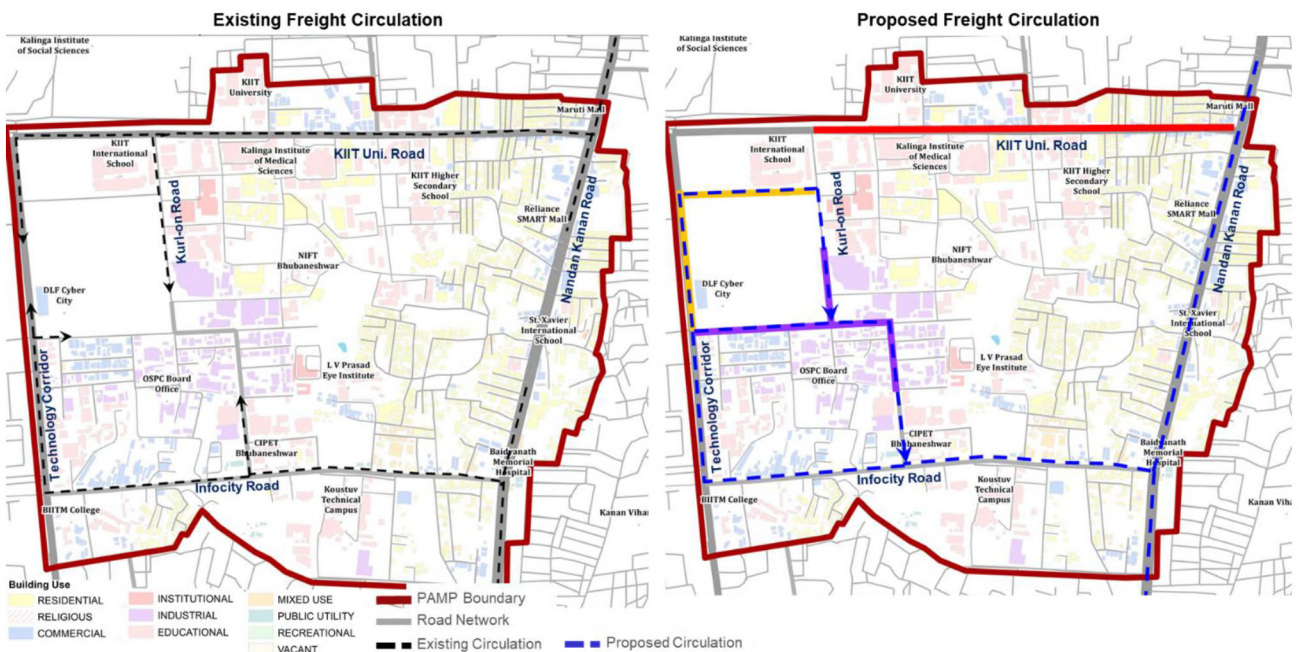


Figure 23 : Proposed freight management in KIIT University area

5.3.4 IPT PARKING PLAN

IPT stops are proposed at 50 m distance from each transit stop location. Taxi pick up/drop off is proposed near institutes and hospitals. Total 11 IPT stops (ECS 88) are proposed in the area. Signages and wayfinding boards shall be available at each location.

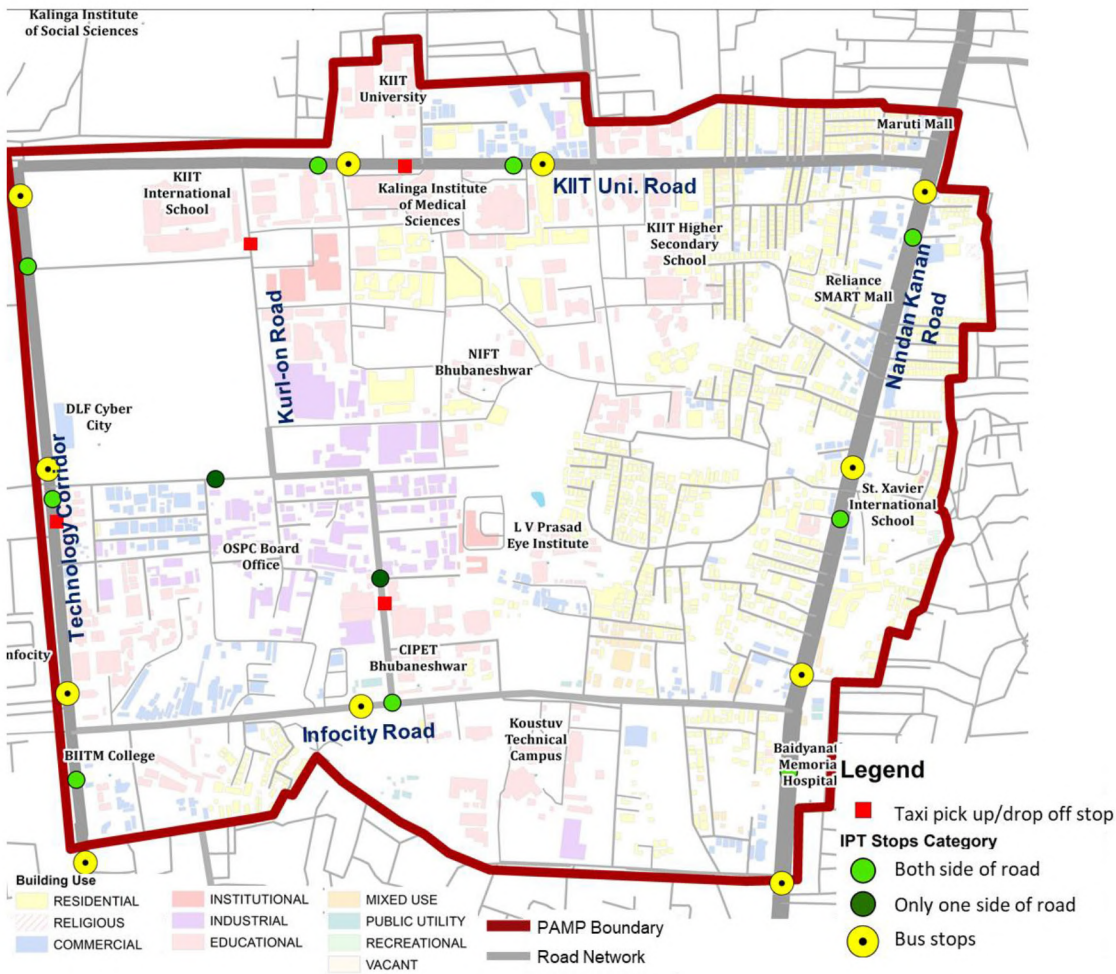


Figure 24 : Proposed IPT stops in KIIT University area

5.3.5 WAYFINDING AND SIGNAGE PLAN

Wayfinding refers to information systems that guide people through physical environments—particularly complex, unfamiliar and ever-changing environments such as hospitals, airports, campuses, mixed-use developments and transport systems.

Wayfinding shall be available at all the bus stop locations and near parking locations to help the customers find their way to the nearby landmarks. The PAMP area should have 11 wayfinding boards at locations presented in the figure below.

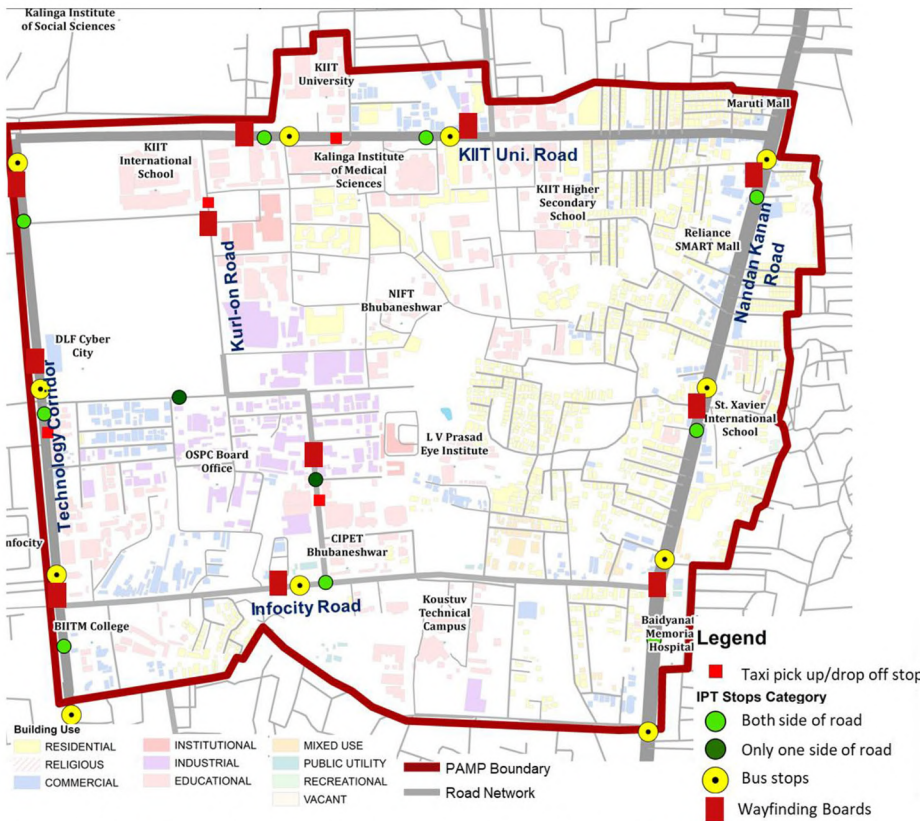


Figure 25 : Wayfinding Board locations in KIIT University area

The boards providing clear and simple information such as route and system maps, schedules, real time travel information and ridership procedures makes the system more attractive and simpler to use, and thus improves rider satisfaction.

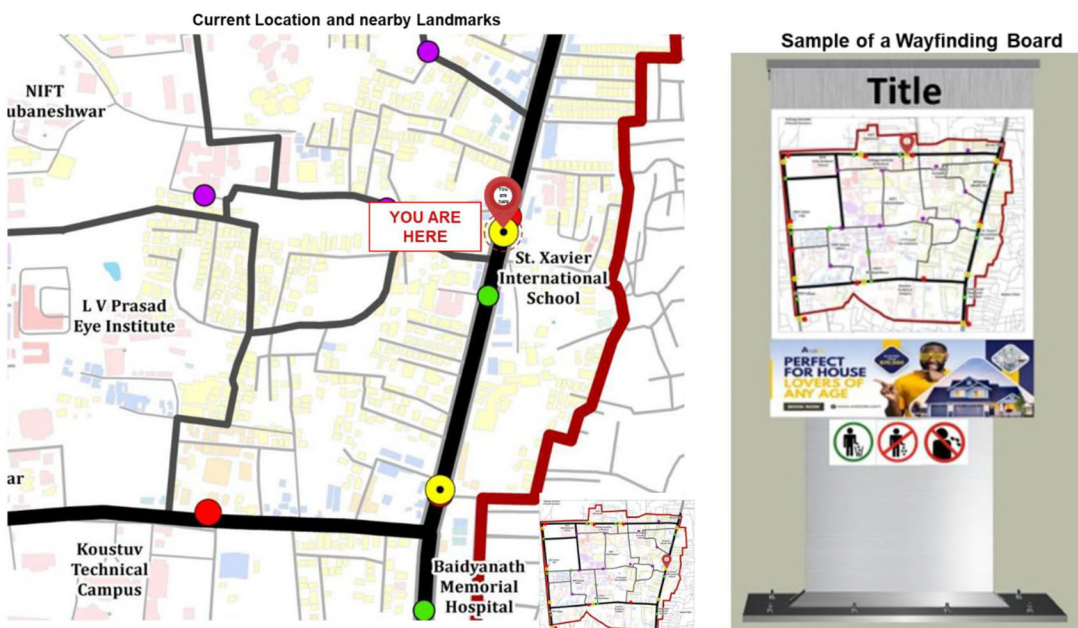


Figure 26 : Example of wayfinding board

5.3.6 SERVICE LANE IMPROVEMENTS

About 3.4 km of service lane is available on Technology Corridor and Nandankanan Road.

1. Technology Corridor service lane is encroached by freight parking; enforcement measures are required for removal of illegal parking and vending activities.

2. Service lane on Nandankanan Road is encroached by vendors and parked vehicles. Improvement in terms of infrastructure and enforcement measures is required.

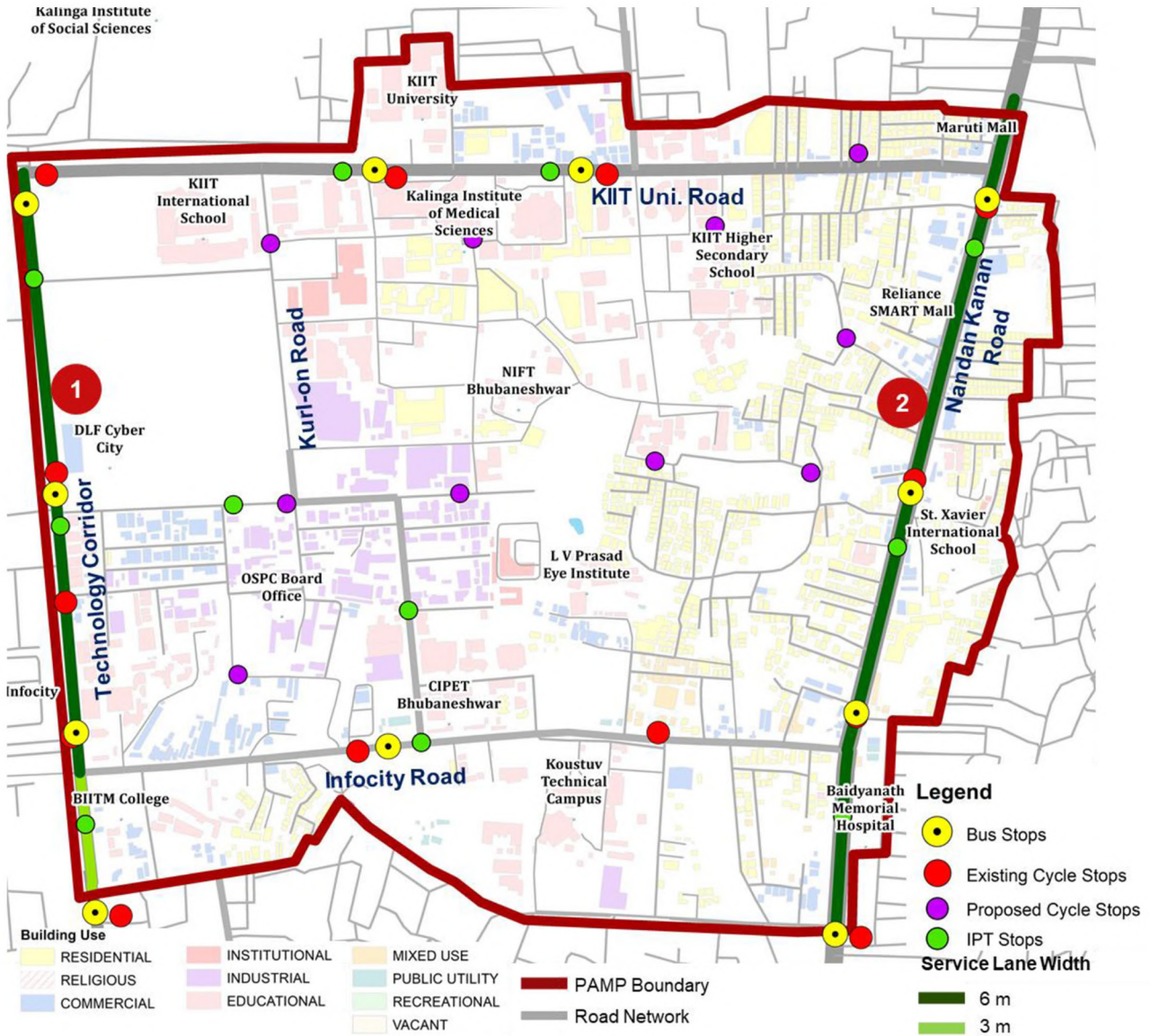
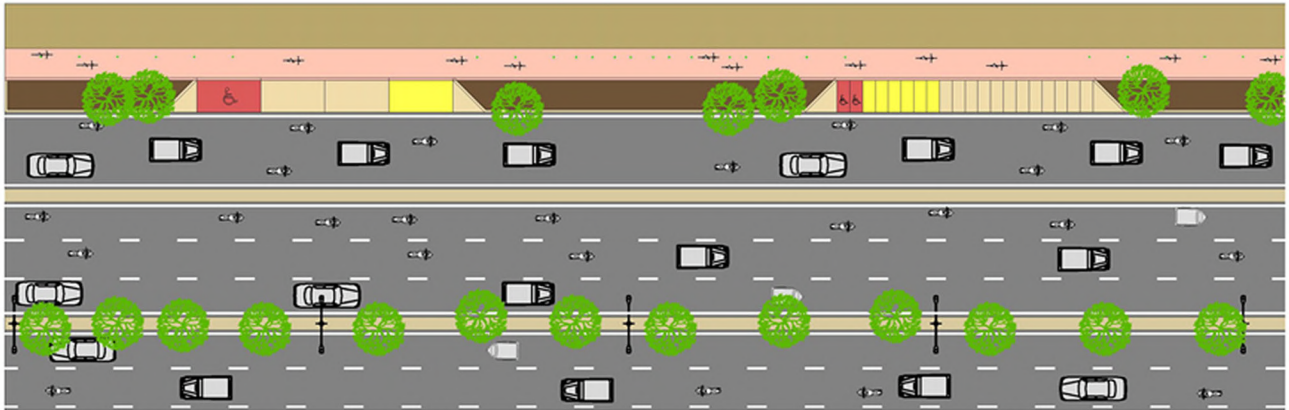


Figure 27 : Service Lane facilities in KIIT University area

5.3.7 DETAILED DESIGNING FOR KIIT UNIVERSITY AREA

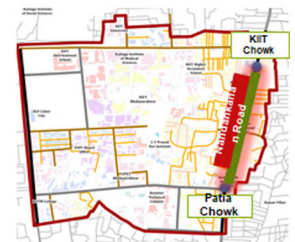
Street design layouts including parking infrastructure for all the major roads and typical layout for roads with RoW less than 18 m

NANDAN KANAN ROAD

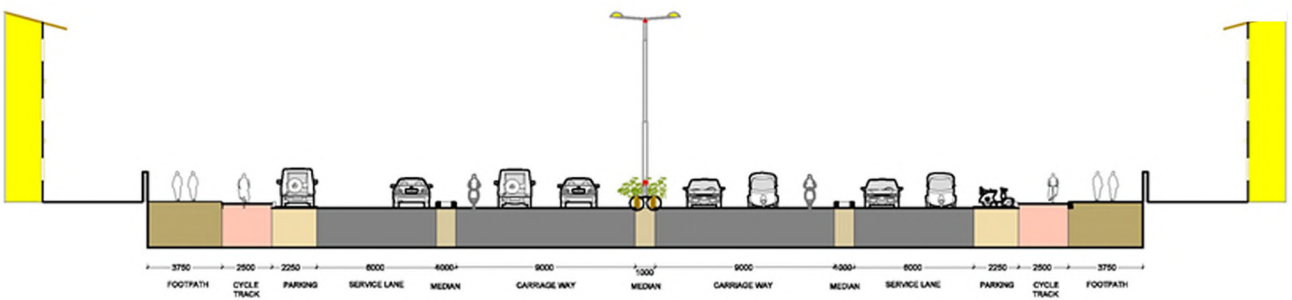


Legend

- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath and Vending zone (only legal)

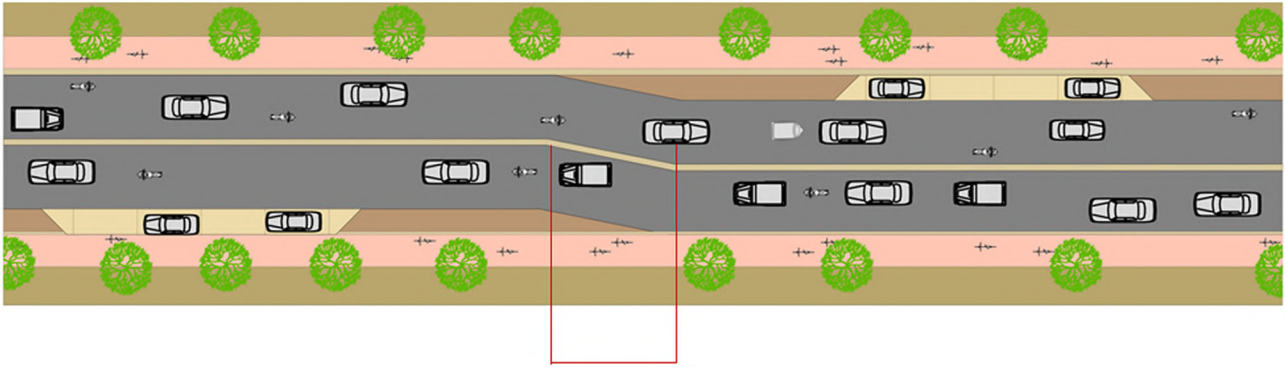


Key plan



Nandan Kanan Road (Indian Oil to Patiya) for 50m Cross Section

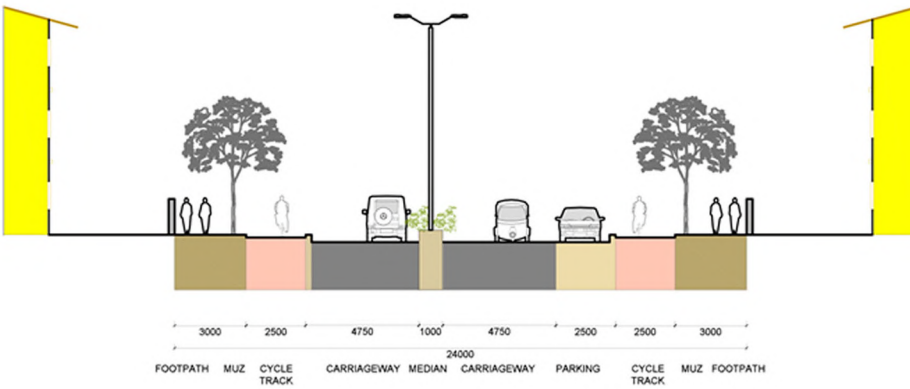
KIIT ROAD



TAPERING MIN 10M

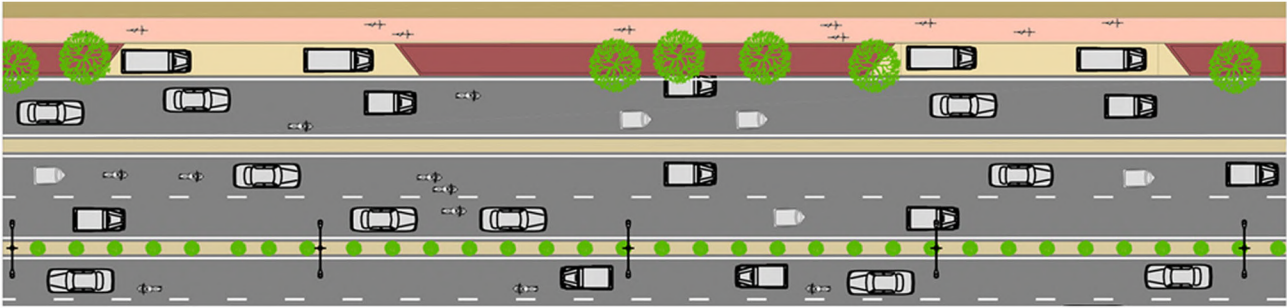
Legend

- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath and Vending zone (only legal)



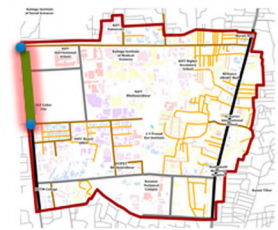
Key plan

TECHNOLOGY ROAD (EYE HOSPITAL ROAD – SHIKHAR CHANDI ROAD)

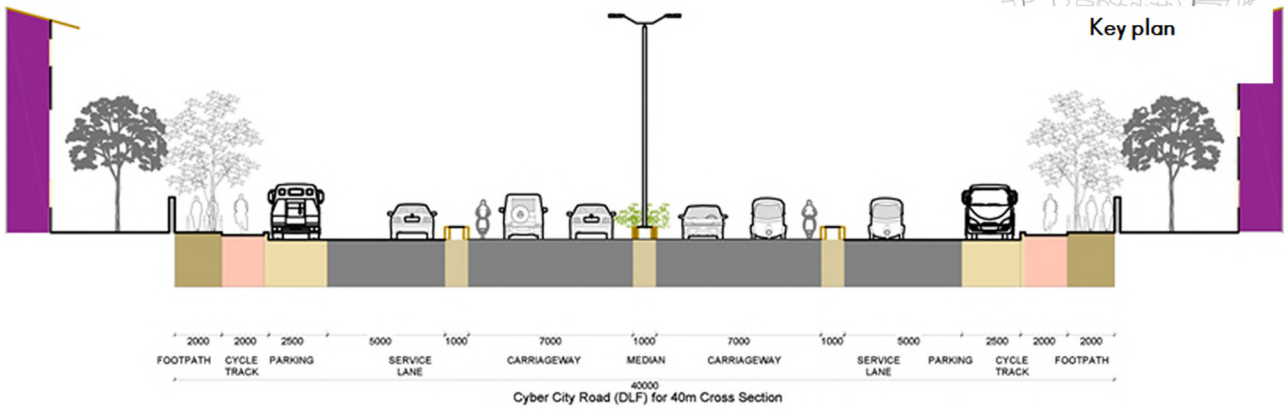


Legend

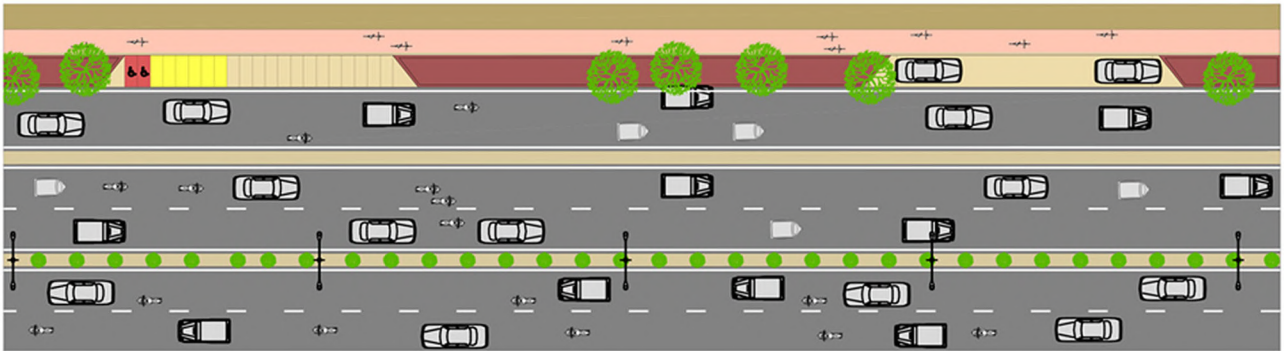
- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath



Key plan

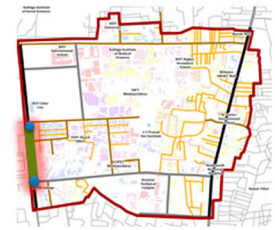


TECHNOLOGY ROAD (INFOCITY SQUARE TO EYE HOSPITAL ROAD)

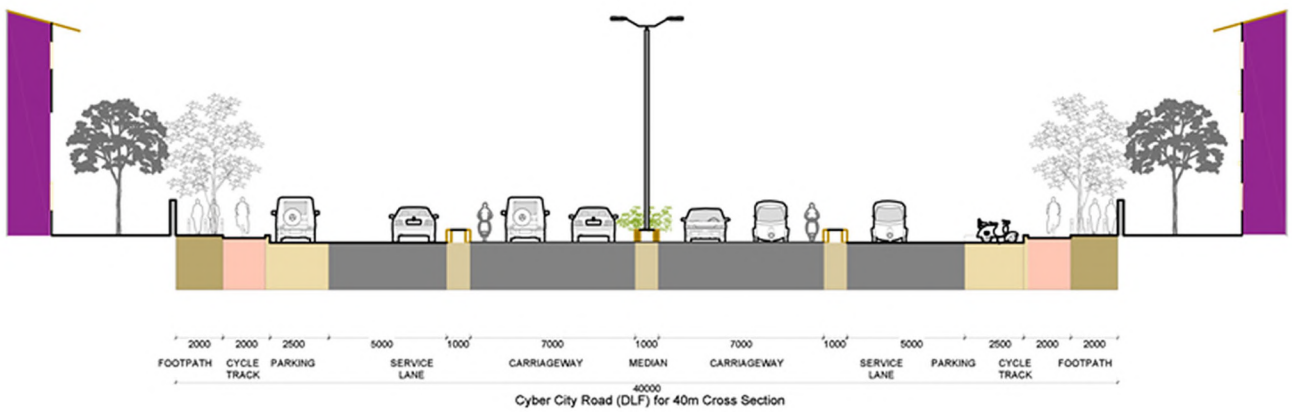


Legend

- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath

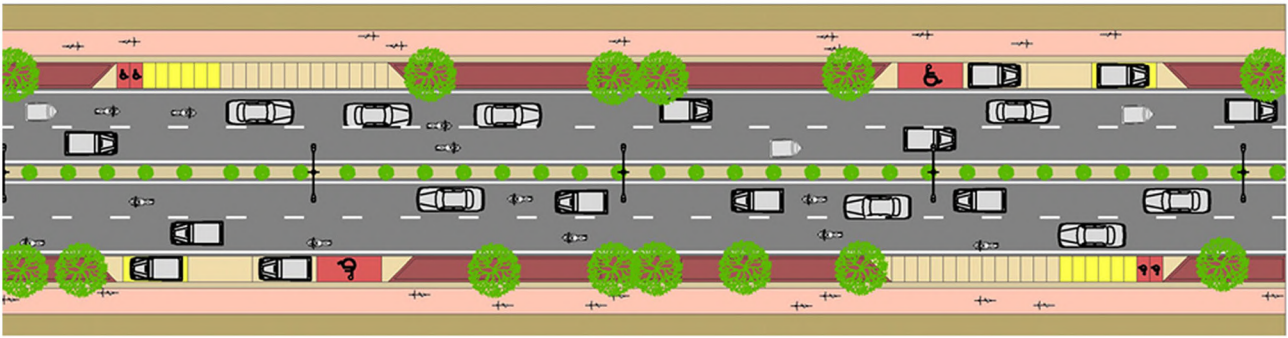


Key plan



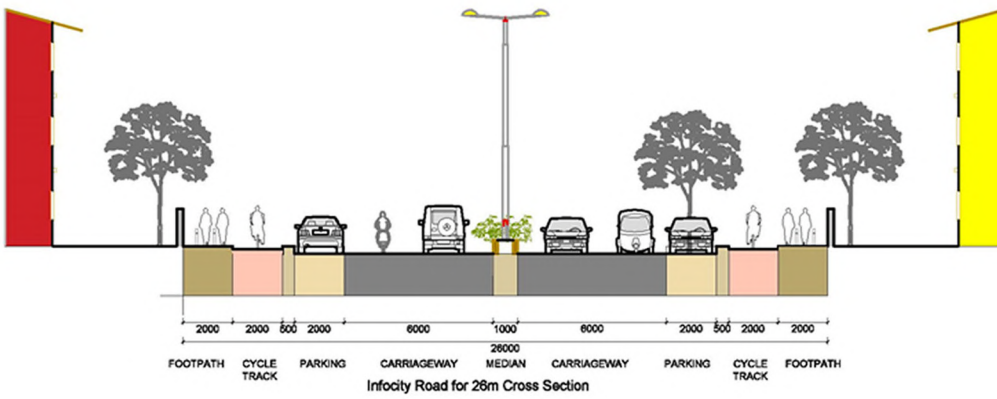
INFOCITY ROAD

Moderate Parking



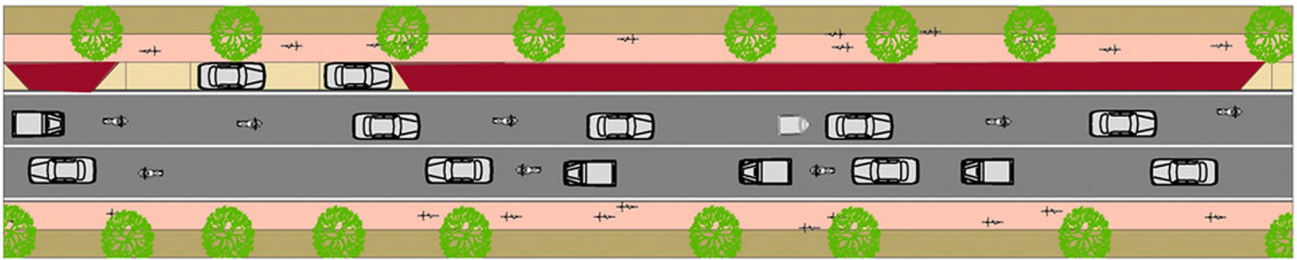
Legend

- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath



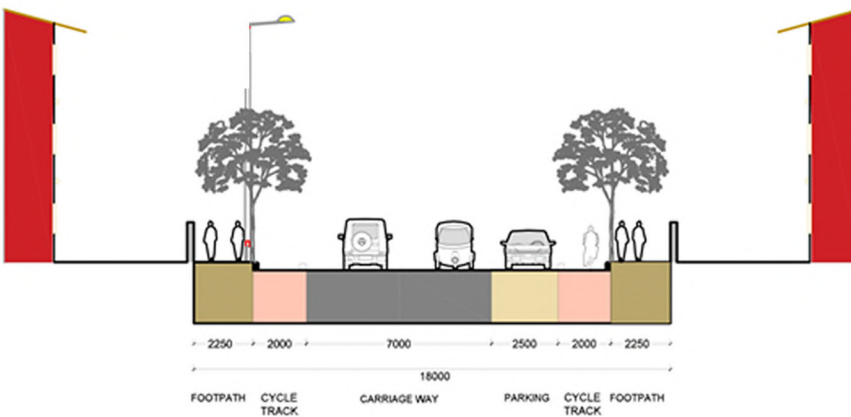
Key plan

SAI INTERNATIONAL SCHOOL ROAD

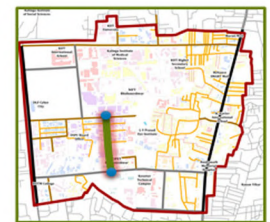


Legend

- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath

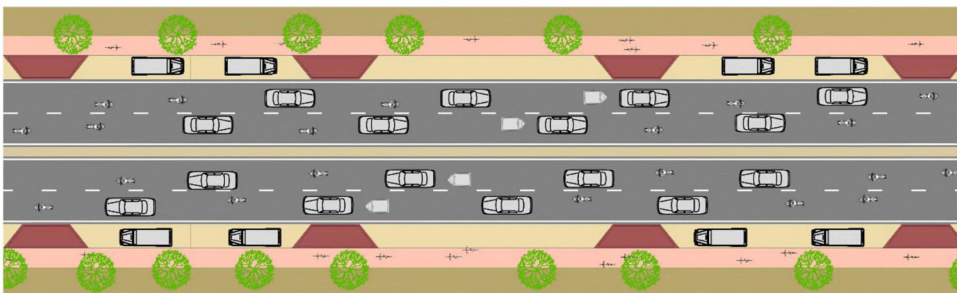


Sai International School Road for 18m Cross Section



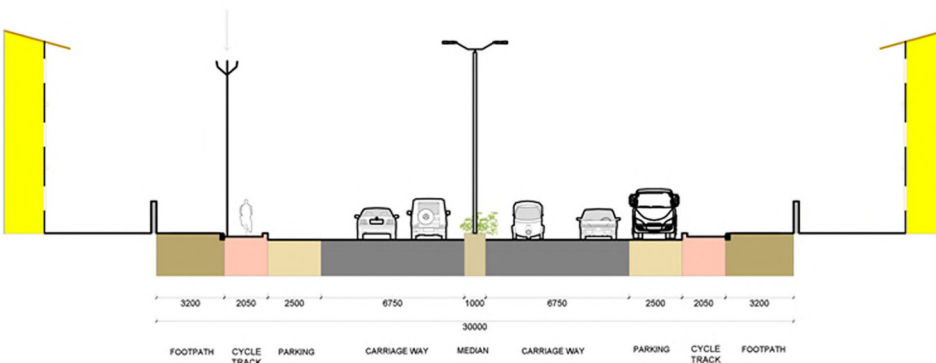
Key plan

KURLON ROAD

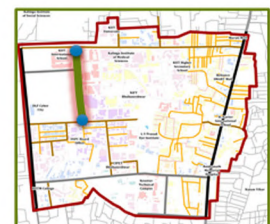


Legend

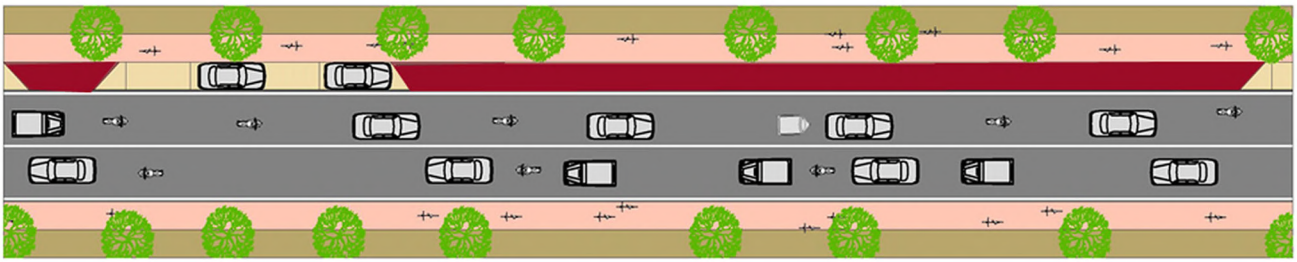
- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath



Kurlon Road for 30m Cross Section



SAI INTERNATIONAL SCHOOL ROAD



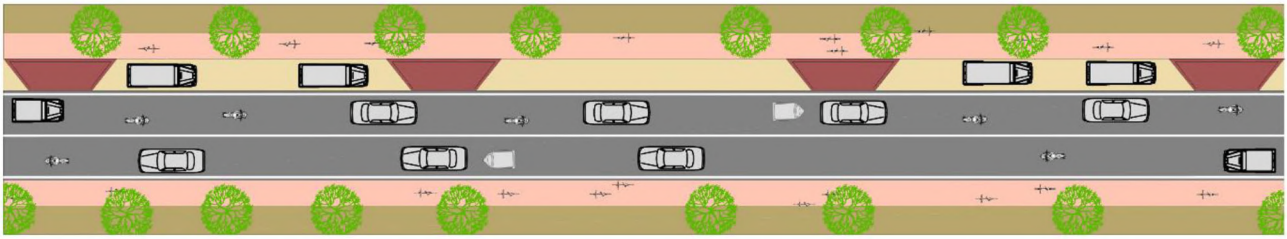
Legend

- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath



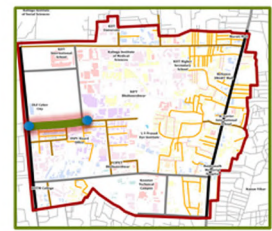
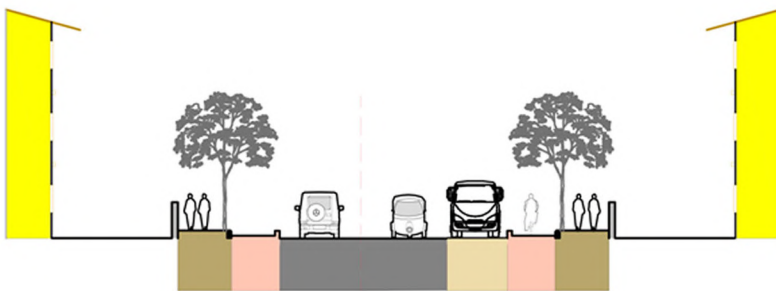
Key plan

EYE HOSPITAL ROAD



Legend

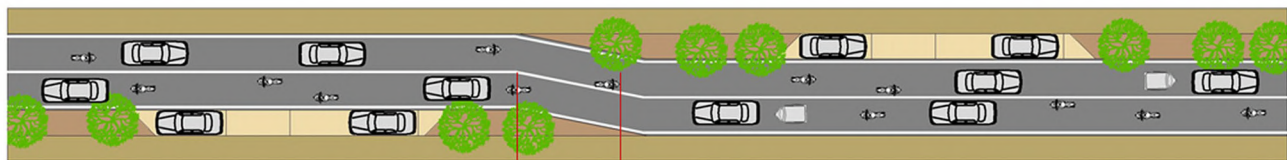
- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath



2250 2000 7000 18000 2500 2000 2250
FOOTPATH CYCLE TRACK CARRIAGE WAY PARKING CYCLE TRACK FOOTPATH

Eye Hospital Road for 18m Cross Section

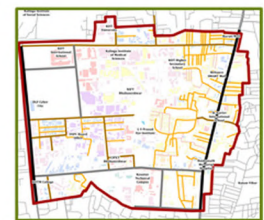
TRIDENT LANE ROAD



TAPERING MIN. 10 M

Legend

- Reserved for Handicapped person
- Reserved for pregnant ladies and women
- Parking bays for all
- Cycle Track
- Landscaping and multi-utility zone
- Footpath

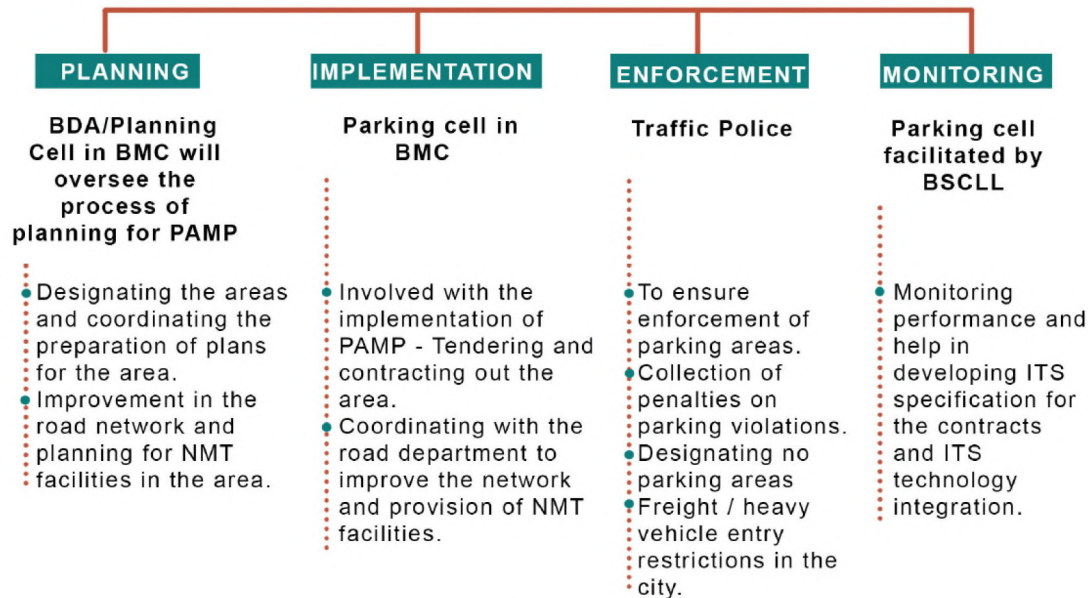


2000 2000 6000 2000
FOOTPATH PARKING CARRIAGE WAY FOOTPATH

Trident Lane Road for 12m Cross Section

5.4 PROPOSED INSTITUTIONAL ARRANGEMENT

The proposed institutional set-up shall involve all the direct and indirect stakeholders to work together for the better management and implementation of the Parking Area Management Plan.



Enforcement shall be the responsibility of the traffic police which can be supported by parking wardens appointed by the BMC. Enforcement measures are detailed in Parking Policy point 4.13 along with monitoring to be done at the control centre of the BSCLL.

5.5 PARKING CONTRACT MANAGEMENT

As mentioned in Parking Policy, delegation of private contractor, the parking tender document shall define the zone boundaries, designated parking area in each zone (both on-street and off-street). The model of operation with private operator shall be based on the PAMP Toolkit. Accordingly, the functions of the private contractor shall include:

- Operate the designated parking bays as per the specifications offered by the BMC.
- Collect parking fees on behalf of the BMC Parking Cell using various payment mechanisms.
- Monitor parking occupancy daily.
- Employ parking wardens for monitoring the illegal parking.
- Adopt appropriate actions against illegally parked vehicles.

The revenue collected shall be the property of the BMC and an annual rate shall be defined for the private contractor.

As mentioned in the Parking Policy (Section 5), the BMC in consultation with UMTA shall create a city parking management committee to monitor the daily implementation activities of the parking policy. The various functions of the implementation committee are discussed along with the policy directives which include fixation of parking prices, review and revision of prices, review of PAMPs, routine monitoring, revision of the policy, etc. The CPMC shall be the appellate authority in case of any disputes between private operator and BMC.

The CPMC may meet regularly as required to take key decisions related to parking. The members of the CPMC are

- Municipal Commissioner, BMC, Chairman
- Planning Member, BDA
- CEO, BSCL
- City Police Commissioner – DCP Traffic
- MD, CRUT
- Deputy Commissioner, Parking Cell, BMC
- Regional Transport Officer
- OSRTC
- Public Works Department
- Account's head, BMC/or any other person responsible for credits from parking revenue
- Representative from cab aggregators
- Representative from freight vehicle operators
- Expert from NGO:
 - Nominee of Expert from NGO
 - NGO for women/child-friendly element in the city
- Academic expert
- Professional expert?
- Vendor Association representative

Assessment of the parking area management plan implementation shall be conducted every 1–2 years as mentioned in section 3.6.4 of PAMP toolkit.



06 IMPLEMENTATION STRATEGY

Based on the data collected and primary surveys, further analysis was carried out to understand the major issues and potentials from the parking perspective. It is observed that the NMT infrastructure (footpath and cycle track) are encroached by parked vehicles. Further, to analyse the parking situation in the area, detailed information was collected, and surveys were conducted at existing parking locations (parking bays) near the major activity centres in the KIIT University area.

6.1 ACTION PLAN

The proposals identified have been phased depending upon urgency and ease of implementation. The major corridors connecting universities, schools and hospitals shall be given priority for the safety purpose of the commuters. The interventions for NMT facilities along this road shall be taken upfront to promote usage of sustainable modes. The roads connecting this major corridor are kept second in the priority as they experience spillover of parking and will be affected with interventions on major corridors. The phasing of strategy implementation is done according to Long Term, Medium Term and Short-Term requirements.

Proposals, that indicating safety of commuters and promotion of sustainable modes along major corridors near institutes shall be implemented upfront and fall under Short-Term. The implementation of strategies on minor roads within 500m buffer of the major corridors shall be carried out just after implementation of Short-Term strategies and hence can be considered as Medium-Term strategies. And the strategies on other minor roads can be implemented at later stage as they will majorly be along residential zone and does not cater to the parking issues in the area.

The implementation along each corridor shall be carried out step by step as

1. PBS stops and IPT stands close to bus stops near institutional buildings
2. Providing way finding boards at all specified locations
3. Restricted freight movement along corridors having institutes.
4. Improvement of walkability around each bus stop (500m) – improve footpath condition and lux levels along corridors with institutes
5. Improvement of cycle tracks and cycling infrastructure to major activity centers
6. Construction of new road design including parking bays
7. Implementation of parking pricing along major roads and on roads within 500 m buffer of major roads to prevent parking spillover.

6.1.1 SUMMARY OF PROPOSAL AND COSTING

All the proposals in the area are summarized in the table below:

Table 12 : Proposal summary in KIIT University area

Road Name	Length (km)	IPT Stops	PBS Stops	Wayfinding Boards	Cycle Track	Cycle Track width (m)	Footpath width (m)	Proposed Parking ECS (Reduced parking)
Nandankanan Road	1.83	2	4 existing	3	Segregated existing	3 existing	> 3 existing	48
KIIT Road	2.09	2	3 existing + 1 proposed	2	Segregated	3	2-3	24
Technology Corridor	1.56	3	2 existing	3	Segregated	3	< 2	40 (only freight)
Eye Hospital Road	1.03	1	2	-	Painted	< 2	2-3	52
Kurl-on Road	0.6	1	1	1	Segregated	2.5	> 3	44
Sai School Road	0.53	1	0	1	Painted	< 2	2-3	8
Info City Road	2.31	1	2 existing	1	Segregated	2	2-3	56
DLF Cyber City Road	0.51	0	0	-	Segregated	2	> 3	42 (only freight)
Police Station Road	0.65	0	1	-	Painted	< 2	> 3	64
Other roads	36.72	0	6	-	Painted	< 2	< 2	425
Total ECS Proposed	47.83	11	22 (12 existing + 10 proposed)	11				810

The costs of road infrastructure facilities have been considered from DSR rates. The block cost considered for a PBS stop is Rs. 50,000 with shed and Rs. 30,000 without shade. The total amount for improvising the parking facility and road infrastructure in the area is around Rs. 192.8 million.

Table 13 : Costing of proposal in KIIT University area

Road Name	Length (km)	PBS Stops	Wayfinding Boards	New Footpath	Cycle Track	Parking Infrastructure & Kerb	Total
Block Cost (INR)		<ul style="list-style-type: none"> Rs. 1,00,000/- cost per station Rs. 25,000/- per bicycle cost 	<ul style="list-style-type: none"> INR 5,000/- per board 	<ul style="list-style-type: none"> Rs. 50 lakh per km for new footpath 	<ul style="list-style-type: none"> Rs. 1500 per m2 for cold applied cycle tracks Rs. 8000 per m3 of median kerb 	<ul style="list-style-type: none"> Rs. 300/- per m2 for bitumen sections Rs. 950 per m2 for paver blocks Rs. 960 per m3 for WMM Rs. 8000 per m3 of median kerb Rs.700/- per m2 for marking 	-
Nandankanan Road	1.83	-	15,000	-	-	10,770,760	10,785,760
KIIT Road	2.09	275,000	10,000	10,450,000	3,137,174	13,024,200	26,896,374
Technology Corridor	1.56	-	15,000	-	2,341,622	9,203,180	11,559,802
Eye Hospital Road	1.03	550,000	-	5,150,000	1,545,000	5,476,100	12,721,100
Kurl-on road	0.6	275,000	5,000	3,000,000	900,624	2,868,320	7,048,944
Sai School Road	0.53	-	5,000	2,650,000	795,000	3,257,940	6,707,940
Info City Road	2.31	-	5,000	-	3,467,402	13,703,760	17,176,162
DLF Cyber City Road	0.51	-	-	-	765,000	2,330,160	3,095,160
Police Station Road	0.65	275,000	-	3,250,000	-	2,724,120	6,249,120
Other roads	36.72	1,650,000	-	125,000,000	55,080,000	3,689,980	185,419,980
Total	47.83	3,025,000	55,000	149,500,000	68,031,822	67,048,520	287,660,342

07 SUMMARY

The prepared PAMP for KIIT university area shall help the local authorities in identifying parking related issues in the area and introduce strategies to manage parking supply and demand. The area being a major educational hub of the city, includes major institutes like schools colleges and hospitals. It also has i witness's encroachment, and enforcement issues. The strategy adopted promotes other sustainable modes like NMT and PT by improving existing infrastructure and reducing the parking supply in the area. The institutional setup and enforcement measures will help the local authorities to properly plan, manage and implement the proposed PAMP plan.



Source : CoE-UT, 2021



This report was undertaken as a part of the “Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT)”, a project implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Ministry of Housing and Urban Affairs (MoHUA), Government of India and commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). Under the aegis of the Green Urban Mobility Partnership between Germany and India, SMART-SUT aims to facilitate and improve the planning and implementation of sustainable urban transport systems in Indian states and cities.