CHAPTER-4

LAND USE PATTERN AND TRANSPORTATION IN CORE AREA: CURRENT ISSUES

4.1 Introduction:
Indian cities have to face huge challenges because of population growth and rapid urbanization where Pune in no exception. According to McKinsey, the country’s cities are expected to grow from to a whopping population and need larger capital investment over the next 20 years. Without adequate design and planning, the large scale urban growth could exacerbate existing problems of congestion, pollution, and traffic safety. Transportation network facilitate people’s need to move for work, recreation, education, shopping and other socio economic requirements. The spatial arrangement of the various land uses or activities across the city and around is an important factor in determining the travel demand of the people. In order to address the issue of integrating the two most important components of city planning land use and transport; there is a need for a clear understanding of the effects of the existing and proposed land use development on the mobility needs of the people in terms of demand, mode choices and travel patterns in the city in question. This chapter presents the study and analysis of land use pattern in samples study area in city of Pune in context of transportation. The travel pattern, travel behavior is empirically examined in order to identify architectural and planning parameters that have a bearing on sustainable planning with an integrated land use and mass transit systems. The first part presents the study of land use pattern and its impact ----

4.2 Land Use and Transportation:
Land use and transport are intricately related. While urban structure determines travel demand and transport supply influences urban structure. The location and design of spatial development has a fundamental influence on travel patterns. At the same time, the location and characteristics of major transport infrastructure impacts the allocation of land uses from both macro and site plan perspectives. It is important to understand purpose of planning, history and legal context and planning approaches and the relationship between land use and transportation system.
This research considers that the city has hierarchy of planning based on the following criteria’s which includes land use plan which plays an important role in prospective growth of the city. This gives the direction to transportation plans along with economic development strategies. Another aspect is the housing demand and its assessments within the regional context.

4.3 Methodology and Context:

The Pune city has around six major road communications by means of road transportation. There are three rail corridors which connects Pune city. Mumbai metropolitan city is well connected by rail, old national high way number four and expressway. Pune is well connected by air ways from all national and international cities too. The second route is Solapur to Pune by means of national highway number 09. The third connection of road is state high via Mulashi to Kokan region to connect the Mumbai Goa highway. Next link is Aurangabad Pune via Ahmadnagar expressway. Further link is Pune Nasik highway Via Sangamner city. The next link is Baramati Pune highway via Saswad, Jejuri etc. Another link is again Saswad to Pune via Bopdeo-ghat zone section. The most important road network to connect western Maharashtra is Pune Bangalore national high way number four.

Out of these seven linking corridors Pune Municipal Corporation has proposed sixteen BRT routes and more than four BRT routes are already implemented within the city. On Pune Satara road Swargate to Katraj Junction is one of the BRT corridor is operated since last four years. This is a part of core area of town and next connect again Pune Bangalore highway. Current status of transportation in the study area is explored with systematic naturalistic observations. This was mainly focused to understand the usage pattern of the transportation network of the users. The area under study has Bus Rapid Transport (BRT) corridor. Due to the increase in traffic on this road in the last two decades or so, the Pune Municipal Corporation has constructed two flyovers, one from Swargate Bus Terminus to Panchami Hotel and the other from Padamavati to Bharati Vidyapeeth/Katraj. The construction of these two flyovers has considerably reduced the travel time between Swargate to Katraj 7 km route and also the heavy traffic, this highway had been facing over the years.

The methodology adopted includes the following steps:

4.3.1 Naturalistic observation: In the core area identified corridor was physically observed based on which land use and typology of the buildings was plotted on the
base map. The existing land use like public and semi public building, open spaces and other ancillary land uses were marked. For naturalistic observations the selected points which are of importance like flyovers and subways were selected where the movement of vehicular traffic as well as pedestrian at peak hour, non peak hour times were observed, Notes were taken in order to identify the pattern of use and identify various problems. It is followed by a visual survey.

For this study the area under study is divided into twelve segments stretching from Swargate to Katraj as shown in figure 4.1. Each junction is studied in details with reference to traffic pattern, land use and streetscape characteristics. The current land use observed and landmark structures are documented. The following section presents analysis of land use pattern and its effect on transportation network with reference to the selected segments.

The BRT route as pilot program is implemented by the Pune Municipal Corporation with the assistance of state and central government. This BRT road is well connected Swargate bus depot to the town of Satara in the southern part of Maharashtra. This road is a part of Mumbai–Chennai national highway (NH-4). Due to the increase in traffic on this road Pune Municipal Corporation has constructed two flyovers, one from Swargate Bus Terminus to Panchami Hotel and the other from Padamavati to Bharati Vidyapeeth educational campus at Katraj-Dhankavadi, Pune. The construction of these two flyovers has considerably reduced the travel time between Swargate to Katraj. There are thirteen city bus stops along Swargate to Katraj. The landmark buildings and complexes are given at each interval. The study segment is divided into twelve parts each of which is discussed in the following section as shown in figure 4.1

**Swargate**  
**Katraj**

![Figure 4.1: Shows key plan of study segment in core of the Pune city](Source by author)

### 4.3 Details of study segment:
4.3.1 Swargate Junction:

Swargate is the regional bus terminal of Pune city. It is connected to main link to Sholapur road towards east. Towards west side the famous Saras-baug connects the part of city via Nehru stadium. Towards the north it connects to Shivajinagar via a famous Shaniwarwada monument and Pune Municipal Corporation. On the southern side it leads to Pune-Satara road and connects western Maharashtra. Western side is connected to Saras-baug and part of Pune city. There are a number of important buildings along this road like Nehru stadium and Tahasildar office of Haveli. This section faces the following problems:

1- Inadequate parking for private and public vehicles.
2- No control on pedestrian and vehicular movement in the absence of traffic islands.
3- Inadequate design of bus stops particularly availability of waiting space.
4- Absence of pedestrian crossing making is highly risky to cross the road.

![Swargate Junction Map](image)

Figure 4.2: key plan of Swargate chowk. (Source-by author)

4.3.2 Laxminarayn Cinema Theatre:

The second segments start from Laxminarayn theatre which is one of the oldest movie theatres in Pune. On the east side it links with Mukundnagr and further to Wanwoori. West side road connect to Mitramandal colony and further connect to Saras-baug. Main Pune Satara road provides approach to the S.T. colony which is always full of vehicles used for private goods transport services. The junction is encroached with a
number of hawkers as well as there is an unauthorized fish market on left side of the road. The canal passes between the Swargate junction and Laxminarayn junction. The problems identified are:

![Figure 4.3: Key plan of Laxminarayn chowk. (Source-by author)](image)

1- Main roads are occupied by goods and service vehicles most of the time leaving less space for other modes of transport.

2- All private luxury buses going towards Satara found stopped at this junction where loading unloading of passengers and goods create traffic congestion.

3- Pedestrian hardly use sub way which is not adequately designed and suffers with poor lighting ventilation as well as safety and security of the users is at stake.

4- Presence of Laxminarayn cinema at the corner of the main road where the exits of the theatre is on the main road which result in excessive flow of people and vehicles in peak times.

**4.3.3 Saibaba Temple/Panchami hotel or S.T. Colony junction:**

Next segment is identified with the presence of various landmark buildings and facilities like Gajanan Maharaj Temple and Panchami hotel. On the east side it links to Mukundnag via small link road. On West side road connect to Parvati base or Gajanan Maharaj Temple which further connect to Sahakarnagr. This is characterized by commercial activities because of the presence of many restaurants, hotels, hospitals, and corporate office buildings. This segment has experienced major land use pattern changes which in turn adversely affected the transpiration system as a whole. The major problems identified are as follows:
1- Various residential colonies located along the both sides which are connected with narrow colony roads which are converted into commercial putting more pressure on the existing roads. As a result they suffer with slow moving traffic and traffic congestion in peak hours.

2- On the left and right hand side there is commercial land use. The junction has not adequate space for pedestrians and parking for vehicles.

3- No enough number of Zebra crossings and people are finding it is highly problematic to cross the road.

4- The traffic includes PMPML buses, MSRDTC buses, private cars, scooters, heavy goods vehicles and company buses in addition to ambulances. This makes traffic management critical.

### 4.3.4 City pride theater or Bhapkar Petrol Pump junction:

Forth segment is a major junction which connects market yard on the east side which is one of the largest market selling agro based products. People from all over the Maharashtra come for agro-based product sale which result in presence of large number of service and goods vehicles on the road. West side road connect to Parvati base or Gajanan Maharaj Temple which further connect to Sahakarnagr. On the south east side there is road to Bibwewadi and further it connects to Upper Indiaranagar and Ganga-dam areas. Presence of one of the oldest multiplex “City pride” further contributes in traffic volume. The main problems this segment face is:
1- City pride junction is it always occupied with heavy vehicular traffic going towards Satara as well as Market yard.

2- The entry and exist of city pride multiplex is on the main Pune –Satara road which create the traffic congestion often.

3- A large number of commercial complexes located on the both sides do not have the adequate parking facilities. In addition there are many hospitals, hotels and medicals shops all of them fond using road as parking area.

4- The area assigned for BRT stops is very less.

4.3.5 Areyashawar corner junction:
On the east side of Aranyneshwar corner junction has commercial and residential complexes. West side road goes to Sahakarnagr residential area. The problems identified are:

Figure 4.5: key plan of city pride chowk. (Source-by author)

Figure 4.6: key plan of Aranyneshwar (Source-by author)
1- The segment serves as a connection between a large residential area and Satara road which has a mixed type of traffic which include pedestrian, two wheelers, four wheelers etc.

2- There is traffic congestion at the junction during peak hours.

3- From this junction a branch of road connects to Bibwewadi. This point has confusion due non segregated road.

4- The under pass is very small in size and has not proper light, ventilation, and cleanliness to use by the pedestrians.

**4.3.6 Natubaug (Walvekar lawns):**

Next segment is Natubaug on the east side which has commercial and residential complexes which and connects the main road to residential area Bibwewadi. West has commercial and residential complex leads to the part of Sahakarnagr via Taware colony.

![Figure 4.7: Key plan of Natubaug junction (Source-by author)](image)

The identified problems include:

1- Aranyeshwar corner is a business hub which has a number of small scale industrial establishments most of which are not well planned.

2- Absence of required parking facilities results in all the foot paths are encroached by parked two wheelers.

3- Presence of unauthorized vendors and hawkers cause traffic conjunctions.

4- In absence of sub ways people have to cross the roads which do not have Zebra crossings as well as traffic signals are missing. This altogether render this segment highly accident prone.
4.3.7 Swami Vivekananda statue & Padamavati junction:
The south-east side of this segment it leads to residential area like Lokesh society, and it connects to again the part of Bibwewadi in addition to Sangam hospital. West has commercial and residential complexes lead Padamavati gaonthan area and central Sahakarnagr police station. On the south-starts of flyover and reaches to Bharati Vidyapeeth educational campus. West has commercial and residential complexes lead towards Yashawantrao Chavan nagar and a famous Talajai Pathar area. It main connects to Talajai temple and down to north side a famous Sahakarnagr area of city.

Figure 4.8: key plan of Padamavati junction (Source-by author)
This area is very complex in nature as it has multiple land uses as a result is has a number of problems in the context of transportation as mentioned below:
1- This is the area where five roads meet where management pose a great challenge traffic.
2- The junction is full of parked private vehicles along the street.
3- Road connecting to many residential colonies is not wide enough to serve the traffic which is excessive as compared to the carrying capacity of the road.
4- Presence of entry and exit of Annabhau Sathe auditorium makes the situation further grave.
5- Overcrowding results because of traffic of private goods and service and other vehicles
6- In addition to this on the western side there is luxury buses terminal operated by private owners in peak hour time buses adversely affect the traffic movement and result in traffic jams and congestion.
4.3.8 K.K. Market or Shankar Maharaj Math:
Segment eight characterized with the presence of shopping hub K.K. market and religious building Shankar Maharaj Math. On east side it is Upper Indiaranagar which has many commercial and residential complexes. The Pune municipal corporation has reserved area for parking terminal which has main entry on the same road. Same parking space is in present time developed unplanned, unauthorized small scale industries such as fabrication, workshops, etc. On the West side there are commercial and residential complexes as well. The area has mixed land use comprised of residential and commercial which encounters the following problems:
1. Presence of mixed mode of transport because of a commercial area there are goods and service vehicles as well as private vehicles which increase traffic volume and consequent traffic congestion and traffic jams.
2. Lack of parking facility observed which is because of unplanned development.
3. As K.K. market is central commercial hub of this area most of the people come from southern part fringe and rural which affects the traffic and worsening the parking problem.
4. On the main road a holy place called Shankar Maharaj Math which is on the main road creates traffic jam in the evening morning time by the devotees.

![Figure 4.9: key plan of K.K. Market](Source-by-author)

4.3.9 Balajinagar part I:
Segment 8 is Balajinagar its east side the link is goes to Pawar Hospital and Siddhi Hospital. Many commercial and residential complexes towards west Dhankavadi last bus stop. Huge vegetable and other markets mostly took place on the roads. At
crossing there are huge numbers of auto rickshaws, six sits and others private jeeps, buses create traffic congestion. In part one and part two the H.P.petrol pumps are located which has entry and exist on the same road as well as on the same junction. This segment has the following problems:

1- Mostly unauthorized buildings along the main road with commercial activities
   There is not sufficient parking in front of the hotels, lodges, restaurants etc.

2- On the both sides of the road there are hawkers and unauthorized vegetable market located on foot path bocks the traffic.

3- Due to K.K.Market all the roads are blocked due to heavy traffic by the people those visit for shopping. Due to the petrol pumps which affects the traffic and slow down the traffic speed.

4- A series of hotels such as Ravikiran, Akshay, Siddhi etc. have no parking provisions. People area parking their vehicles on the road and bocks the traffic.
4.3.10 Bharati Vidyapeeth Educational Campus:

Bharati Vidyapeeth educational campus is located along this road on east side there are commercial complexes on the both sides while there are many adjoining residential areas. Like Lake town, Rajesh society etc. West has educational campus, State Bank of India branch and PMPML bus depot workshop. This section enjoys a comparatively wider road but presence of heavy traffic makes situation congested.

![Figure 4.12: key plan of Bharati Vidyapeeth (Source-by author)](image)

Problems:

1- Bharati Vidyapeeth educational campus Dhankavadi has main entry from the Pune Satara road. The under pass is connected by service road which is not adequately designed and found accident prone.

2- Surrounding the campus there are hostels for students which are accompanied with ancillary facilities such as restaurants, hotels and banking services and other necessary shopping facilities. Due to this there is always heavy traffic on roads.

3- Opposite there is snake park on every weekend days and holidays this road become heavily crowded.

4- No adequate pedestrian crossings make it accident prone for pedestrians.

5- Katraj milk dairy has main approach from this road. All the visitors to this milk dairy park their vehicle on the road reducing passage for vehicular traffic.

4.3.11 Katraj Milk Dairy junction or Rajeev Gandhi zoological garden:

This section has two important land uses that is Katraj Milk Dairy and Rajeev Gandhi zoological garden on east side which is a large snake park and Leisure Park.
West has Katraj dairy distribution and processing unit. Presence of as Pune municipal corporation’s garbage disposal plant, Sarhad school and Rajeev Gandhi Institute of Information and Bio-technology a part of Bharati Vidyapeeth campus and residential areas makes the area a complex mix of various land use.

**The problems identified are:**

1- This area experienced unprecedented ribbon development along Katraj Mumbai highway, and by pass express road from Katraj to Sholapur.

2- The hilltop and hill slopes which are shown in the development plan as open spaces where no construction activities are allowed but presently covered with unauthorized housing.

3- This junction has traffic prone areas due to Katraj dairy retail and wholesale outlet as well as the main entrance is at junction only.

4- This creates unauthorized parking areas and private vehicle stop at any place and anywhere.

![Figure 4.13: key plan of Katraj Milk Dairy (Source-by author)](image)

**4.3.12 Katraj main junction (Mega highway chowk):**

It is a big junction where east side road goes to Sholapur via Kondwa, Undri, and Pisoli. This also connects to a famous Katraj lake and some residential colonies. West has linked to and Kolhapur i from Narhe-Ambegaon chowk through new tunnel at Jambulwadi and to Mumbai expressway via Hinjewdi a famous IT Park. There is Manikmoti commercial complex and a huge residential called wonder city. This
further connect to the part of Ambegaon (bk) area via Katraj-Dhankavadi west side area.

Figure 4.14: key plan of Katraj junction (Source-by author)

Findings:
1- This junction is overcrowded due to heavy vehicular traffic which includes goods and service vehicles as well as pedestrian movement.
2- There are city main bus stops on the both side of the road which create uncomfortable situation for the commuters.
3- The unauthorized parking lots for all private vehicles which biggest concern of the traffic.

4.3.13 Katraj Lake & Katraj-Satara road to old NH-4 via tunnel road:
From Katraj junction one old N.H.4 connects the Gujwaradi, Mangadewadi. Further via ghat-zone section it meets to main highway by crossing the old tunnel road. Most of Katraj village gaonthan is accessible to this lake. On the east side there is well known Utkarsh Housing society and a part of Shelar farms. On the main road side Santoshnagar, Kinara hotel, Gandharv lawns etc. towards the west side Anjali nagar, Agam temple, and unauthorized housing on the hill top.
Within ghat-zone section it meets to main highway by crossing the old tunnel road .in this segment Hotel Ambika, Petrol pump at Mangadewadi, Sadgurukripa Maa Pranam built-con, Bafana automotive, Vivo Ayush enterprises India pvt. Ltd. Gurudawara
Nanknagar and Meritech Company. Further it leads to a famous Janseva foundation.

The identified problems are:

1. All the development along this part is unauthorized only. All the hill tops and slopes are encroached by poor people for housing purposes.
2. Most of the road side growth is commercial. the natural water flows or low laying lands are filed for the development purpose.

4.4 Visual Survey:

Photographic survey conducted of all the roads sub-roads and junctions in peak hour. Photographs were taken from Katraj to Swargate on the both sides of the road. Main thrust was given to capture images of the street junctions and landmark buildings.
4.4.1 Streetscape Character:
The area under study is characterized by a streetscape which is not uniform in nature. Some newly constructed building facades are modern in nature with glass facades while some buildings possess old vernacular character. Following are some representative pictures which demonstrate the varied character of streetscape. A combination of low rise masonry buildings with steel glass facades observed. Huge hoardings along road creating a sort of visual pollution which is a commonly observed phenomenon in the city of Pune.

4.4.2 Panchami hotel junction:
Panchami Hotel is located on the junction of Satara road and road connecting. Here is no parking zone; no adequate parking area being it is commercial junction.

Figure 4.17: Phule commercial complex

Figure 4.18: Lotus court complex

Figure 4.19: key plan of Katraj to old NH-4 via tunnel (Source-by author)

4.4.3 City pride junction:
Panchami Hotel is located on the junction of Satara road and road connecting. Here is no parking zone; no adequate parking area being it is commercial junction.
Figure 4.20: City Pride Junction
4.4.4 Aranyeshwar junction:

Figure-4.21 Aranyeshwar corner
4.4.5 Natubaug junction:

Figure-4.22: Natubaug junction
4.4.6 Balajinagar junction:

Figure 4.23 Balajinagar Flyover area

4.5 Effect on Transportation Network:

The detailed analysis of traffic based on systematic observation is presented in the following section.

4.5.1 Road from Swargate towards Satara:

Multi vehicular traffic observed. Absence of traffic islands creating un-segregate traffic. No pedestrian crossing creating disastrous condition for pedestrians. People
found waiting for busses obstructing the vehicular movement as well as increasing possibility of accidents.

Figure-4.24 Flyover connecting point

Figure-4.25 Flyover connecting at two levels
Sustainable Planning Strategies for an Integrated land use and Mass Transit System with Reference to Core and Fringe: “A Case Study of Pune”

Figure 4.26 Swargate road junction traffic

Figure 4.27 Flyover and vehicular movement at two levels
Figure-4.28: Streetscape of Padamavati junction.
4.6 Structured Interview:
Structured interviews were conducted at identified junction and bus stops in order to explore people’s perception regarding current status of transportation facilities. The interview schedule included the following concerns.

The travel experience cost of travel, safety issues, frequency and efficiency of the service, traffic conditions, congestions, travelling and waiting time and their aspirations and suggestions. The sample composed of 45 people both male and female of age group from 20 to 70 years. The interviews were audio taped and transcribed with verbatim coding. Verbatim responses which have generated high volumes of valuable information and insights are presented in the following section.

- Over all services is good but traffic conjunction at junction which is serious matter.
- Visible display route boards are needed.
- Accident rate is more at junction
- Buses are always full and frequency is not in time.
- Very frequent break down of buses.
- The rate of ticket is not affordable to common people.
- There is question of handicap people to travel in peak period. Buses are not clean.
- Planning of BRT not proper due to mix traffic in the corridor.
- Bus stops and buses are not maintained properly. Singles are not observed by the users.
- It is difficult to cross main road.
- Vehicles are more than the road capacity.
- The city bus stops have not proper sitting and waiting arrangement. All the buses are.
- Due to break down buses time is more required to travel
- Through traffic in BRT corridor is more risky
- To reach to Katraj requires change the buses so more money is required.
- The buses landing and entering is seriously risky due to space near by the sides of buses.
- At midnight buses are not available.
- Traffic rule must be observed.
- Dropping and sitting problem is serious issues. During peak time ladies special buses.
- E-ticket is needed as it is question of high crowded buses.
- The safety of ladies mostly neglected.
- BRT at center of road is totally wrong. It is risky to all group of people.
- Need to provide separate buses to ladies.
- In night time frequency is less.
- Difficult to cross the road with kids, materials.
- Need proper and strict discipline to.
- Seen accident on BRT corridor at Balajinar thought not to travel by BRT.
- The environmental & air pollution.
- The overall BRT is completely wrong planning. At crossing no care is taken of common people or users.
- BRT is not satisfactory. One bus caught fire and corridor was blocked.
- No safety measure to the ladies in BRT route. There is confusion among the pedestrians and BRT travelers.
- Dangerous to travel by BRT due to traffic jam problem.
- Air and water pollution.
- BRT is very good option but not properly planned by PMC. Requires careful planning and implementation.
- All the BRT within city should be scrapped and need to take from side only in spite of centre.
- The electrical connection is risk for users as they are not properly maintained.
- Crime rate will be more in close type shelter.
- Buses are stopped at zebra crossing and no way to pedestrian. People cross the road or vehicles run without signals.
- The area below fly-over should be properly developed or given for paid parking.
- The roads and BRT buses are always overcrowded. No space for ladies to reach market by sitting.
The work BRT boring and very risky. No control on private and public vehicles at stops.

BRT a number of times break down so as this brings time and money consuming travel.

A number of problem of BRT Like space and environmental pollution. No safety measures of kids and old age people at junction.

All the buses are full need to provide ladies special bus in peak hour time.

Conflict in between BRT and all heavy and private vehicle traffic.

BRT creates very serious problem in peak hour time. So that I cannot reach in time on duty. It is tiresome journey

No safe for ladies in late time and difficult to cross the main to reach BRT stops. All private vehicle runs without signal guidance so that accident chances are more.

BRT frequency must be more in peak hour period. No permission to private vehicles in BRT corridor.

Standing travel is very difficult in BRT. Air pollution more than other areas.

Cannot travel through BRT with luggage and children.

It is not also economical.

Need proper shelter for kids and ladies. In peak hour time cannot possible to travel.

Regret on planning of BRT at centre of the road. No provision for handicapped people.

4.7 Analytical Study of Land use Changes:
Land use change has been studied which starts from Katraj junction to Padmavati junction. Starting from Katraj on left side the main Manikmoti commercial complex, wonder city residential area, Katraj dairy and Bharati Vidyapeeth Educational campus, and part of Dhankavadi, Balajinagar, Chavnnagar areas covers till the Padamavati. On the right side there is a famous Snake park garden, Lake view housing society, other residential units along with commercial mainly on the main road as well as at junctions. Interior Rajesh society of more than 200 bungalow plots sanctioned is already developed.
The earlier area along the main road was residential purpose only. Most of structures were in the Grampanchyat limit and further they are merged within the corporation limit. It is seems to be unplanned and unauthorized buildings. The interior roads are very narrow in width. The residential premises are modified and developed as commercial. On the main Satara road a wholesale K.K. Market is complex is established by Kumar properties & there are more than one thousands shop constructed by the builder. Pune... This is mainly attracting the rural as well as city population for commercial activities. The load on all services increased and traffic and transportation failed on the main as well interior roads. Parking problems are occurred due to commercial as well as mixed land use. Land use within Katraj junction to Padmavati junction of study area in 2005 and 2016 is as under.
4.7.1 Segment I: Katraj to Padmavati

Land use Katraj to Padmavati -2005

Way to Mumbai junction    Chavannagar

Katraj junction   Balajiagar   Padmavati junction

Figure 4.29: Land use of Katraj to Padmavati 2005.
(Source: Google maps & Survey)

Segment I: Land use Katraj to Padmavati -2016

Way to Mumbai junction    Chavannagar

Katraj junction   Balajiagar   Padmavati junction

Figure 4.30: Land use of Katraj to Padmavati 2016.
(Source: Google maps & Survey)
The study observations are –

In 2005 industrial area was 6% and 2016 industrial land use is increased to 8% 2016. Residential area was 18% which is increased to 26% There is no semi public area which was 3% in year 2005. Agricultural land use changed from 62% to 41 % while commercial area increased by 1% in the period from 2005 to 2016. Road area experienced an increase by 6%. Due to change use residential land use to mixed land use along the main road and internal road side at junction the road became over crowded. There is excessive load on road because of traffic and transportation. The parking problems increased to a great extent. There is no safety of pedestrians and elderly.

4.7.2 Segment II : Padmavati to Citypride

This segment starts from the Swami Vivekananda Statue to a famous City pride Multiplex. The main road is connected by road on right hand side to Bibewadi and on left to Sahakarnagr. There are two bus stops Natubaug and Aranyeshawar which connect to again Bibewadi and part of Sahakarnagr towards west. This cross junction has subway for pedistrains and two wheelers. The next juction is ‘T’ junction which leads the road to the Market yard Pune. On this segment there are commercial premises and entertainment comples like Ann Bhau Sathe Auditourium
and City pride multiplex. Arneyeshawar area has a many public buildings like Walvekar lawn which is community hall. On the both sides of roads there are mostly commercial and residential premises with aminities and facilities like Bhapkar petrol pump. Land use within Padmavati to Citipride Multiplex junction of study area in 2005 and 2016 is as under.

**Segment II : Land use of Padmavati to Citypride -2005**

![Map of land use Padmavati to Citypride 2005](image)

**Segment II : Land use of Padmavati to Citypride -2016**

![Map of land use Padmavati to Citypride 2016](image)
There is change in land use is observed as under.
In 2005 industrial area was 17% which is decreased to 15% in 2016. Residential area experienced 17% increase. Alarming decrease in Agricultural land use noticed as it is currently just 6% which previously was 56%. Commercial land use increased by 10% while marginal increase by 3% observed.
This shows the significant change in land use plan in last one decade. Change in residential, industrial and mixed land uses which leads the overcrowding, increase in vehicular traffic etc. and creates the parking problem for heavy as well light vehicles.
The traffic of trucks and service vehicles carrying agricultural products brought from surrounding districts puts great pressure on road. There are various types of hotels, restaurants and fast food centres located within this area which also contribute in terms of increased traffic.

4.7.3 Segment III: Citypride to Laxminarayan
The fourth segment starts from city pride to Laxminarayn cinema chowk. The road has hotel, business centers and central hub for goods and transport services.
Land use within Citypride Multiplex to Laxminarayn cinema junction of study area in 2005 and 2016.
Segment III : Land use Citypride to Laxminarayan -2005

Citipride junction

Laxminarayn

Arneshawar junction
Towards Market yard
Way to Mukundnagar

Figure - 4.35: land use of Citipride Multiplex to Laximinarayan 2005.
(Source-Google maps & Survey)

Segment III: Land use Citypride to Laxminarayan -2016

Citipride junction

Laxminarayn

Arneshawar junction
Towards Market yard
Way to Mukundnagar

Figure - 4.36: land use of Citipride Multiplex to Laximinarayan 2016.
(Source-Google maps & Survey)
There is change in land use is observed as under.
Increase in industrial land use from 3% to 6% while residential area is decreased by 7%. Substantial decrease in agricultural land use noticed which was 75% in 2005 and 30% in 2016. Commercial area was 10% which is increased to 25% while 6% road area was increased to 10%.

4.7.4 Segment IV: Laxminarayan to Shaniwarwada:
Swargate junction mainly connects the national highway number -09 known as Pune Solapur. The second is Pune Satara road which is old national high number 04 and now meet at newly six lane express way from Pune to Bangalore. The west side road connects to the interior part of Pune city. The connecting road cater for many public, religious, commercial buildings like Mandai, PMT building, sales tax, office, DRAT court, Tahasildar Haveli office, Dagdusheth Ganpati temple, timber market, Bhor-ali (steel merchants) in addition to many residential districts like Police colony and
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Sadashiv Peth, Land use within Laxminarayan cinema junction to Swargate in 2005 and 2016 respectively is as under.

**Segment IV : Land use Laxminarayan to Shaniwarwada -2005**

![Diagram of land use Laxminarayan to Shaniwarwada -2005](image)

Figure -4.38: land use of Laxminarayan to Shaniwarwada 2005
(Source- Google maps & Survey by author)

**Segment IV : Land use Laxminarayan to Shaniwarwada -2016**

![Diagram of land use Laxminarayan to Shaniwarwada -2016](image)

Figure -4.39: land use of Laxminarayan to Shaniwarwada 2016
(Source- Google maps & Survey by author)
There is change in land use in a period from 2005 to 2016 is observed as under. Industrial area changed from 1% to 10%, residential area decreased from 66% to 40% while agricultural land use substantially decreased from 75% to 30%. Marginal increase in road area noticed from 7% to 13%.

4.8 Summary:
The connection between transportation and land use is a fundamental concept in transportation planning. Transportation and land use are inexorably connected as everything that happens to land use has transportation implications and every transportation action affects land use. This chapter analyzed the current status of transport and land use pattern in the core area of the city. The changes in land use examined and its impact on transportation particularly mass transportation examined. The analysis of the empirical work helped in identifying the problems and issues with reference to transportation and land use which are further explored in context of fringe area in the next chapter 5.