# ASSESSING THE IMPACT OF PUNE METRO ON REAL ESTATE MARKET

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**Abstract -** *The purpose of this research is to examine the changes in land use and land values along the planned metro corridor and metro station, as well as to determine the characteristics that influence the magnitude of the increase in land value, deals and investigate their positive and negative consequences. The assessment of the study's correct objective procedure, which includes a description of the personality of the study area, methods used in sample selection and data collecting, and the analytical instruments utilised, is divided into four stages: The research problems were first formulated, which was done with the assistance of a survey of the literature. The study only takes into account residential land usage.The project's consequences will only be studied for one corridor, Vanaz to Ramwadi. Due to a lack of data, certain factors, such as slum land rates, median household incomes, and so on, cannot be analysed in the context of the case study.*

***Key Words***: Pune Metro, Real Estate Values, Land use, FAR, FSI, Additional Stamp Duty.

## 1. INTRODUCTION

Rapid urbanisation, as witnessed today, can have a negative impact on all three aspects, causing economic, social, and environmental harm if not well controlled. Well-planned urbanisation, on the other hand, can maximise the benefits of agglomeration while minimising as many negative impacts as possible.

As previously stated, the greatest demand for sustainable urban and transportation planning is found in middle- and low-income countries, which are the world's fastest urbanising regions. Because of the relatively lower levels of development, specific efforts must be made to improve understanding of urban dynamics in these locations, as well as to better plan for sustainable integration of land use and transportation, so that the negative impacts of haphazard urban growth are reduced.

There is little doubt that better access to physical, economic, and social infrastructure has resulted in positive externalities for India's development. Indian cities are seeing an ongoing spiral of habitats growing on peri urban areas that lack infrastructure yet are home to populations that cannot afford homes in the metropolis and commute to employment within core cities using unsustainable modes of transportation.

The interaction between urban spatial structure and transportation network within a city can either promote or hamper the city's economic productivity and quality of life. Without a doubt, urbanization has enabled residents' economic mobility through the concentration of jobs, technology, healthcare, education, and information.

## 1.1 METRO RAIL TRANSIT'S EFFECT ON LAND VALUES

Metro Rail Transit serves critical economic, social, and environmental functions, and it may generate positive externalities that influence residential property values (RPVs) in real estate markets. Less emphasis has been placed on investigating the effects from both the geographical and temporal perspectives.

There are two types of effects of metro stations on property value. One is a positive externality, which involves improving the property's location, lowering transportation costs, and increasing home prices. The other is a negative externality, such as noise and a cluttered environment produced by greater population movement, which predicts a drop in property prices.

## 1.2 ATTRIBUTES IMPACTING PROPERTY VALUES IN THE METRO STRETCH

The traits that provide value to a product or service are referred to as value drivers.

This chapter will provide an overview of the various independent and dependent metro features that influence the cost of residential homes.

There are two types of features (variables) that influence house prices: temporal attributes and spatial attributes. Spatial features that take space dimension qualities into account. The dimension of time is considered in temporal qualities, and research is centred on the before and after of a certain occurrence.

The surface area of the house, as well as its age, built-up and unbuilt-up portions of the property, the number of rooms, and the number of bathrooms, are all continuous variables. Dummy variables are used to indicate the other physical characteristics of the dwelling, such as its monument status, the availability of a gas heater, etc.

**Attributes of Space**

1. Property size
2. Neighbourhood development as a result of the metro
3. The distance from the metro
4. Greater accessibility as a result of the metro
5. Metro parking facility
6. Exchange
7. Ridership is number seven.
8. Metro-related annoyance
9. Criminal activity in the metro area
10. Congestion in the metro area
11. Metro last-mile connectivity

**Temporal characteristics**
1. Metro Project Announcement
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3. Metro operations

## 1.3. PUNE METRO PROJECT

Pune is the second most populous city in Maharashtra and India's ninth most populous city. Two municipal corporations (one of which is Pune) and three cantonments comprise the metropolitan region.

Pune Metro is a three-line urban Mass Rapid Transit System (MRTS) being built in Pune, Maharashtra by Maharashtra Metro Rail Corporation Limited (Maha-Metro) and the Pune Metropolitan Region Development Authority (PMRDA). The Maharashtra Metro Rail Corporation Limited (MAHA METRO) is a Special Purpose Vehicle (SPV) jointly controlled by the Governments of India and Maharashtra.

MAHA METRO has suggested two Pune Metro alignments. Line one, from Pimpri to Swargate (with 14 Metro stations), is 16.589 kilometres long, whereas Line two, from Vanaz to Ramwadi (with 16 Metro stations), is 14.665 kilometres long. The proposed metro route for Line 2 runs along some of the main highways in the city, including Paud Road, Karve Road, Bund Garden Road, and the Ahmednagar Pune Highway. All three lines will connect at the Civil Court interchange station's nodal station.

## 1.4. NEED OF THIS STUDY

A forecasting valuation model that can assess the worth of real estate property along the Metro route can help investors forecast when and where to forecast along the length of the corridor. According to economic theories, the advantages of various infrastructure and public transportation services will be capitalised whole or partially into land and housing.. Despite these assumptions, no consistent association between residential property prices and proximity to transportation lines has been proven. The reliance on public transportation in Indian metropolitan regions is substantial.

Passengers in major urban settings may be far more sensitive to subtle changes in public transportation services than those in international situations.

## 1.5. AIM

The goal of this study is to examine the change in land use and land values along the proposed metro corridor and metro station, as well as to identify and study the characteristics that determine the magnitude of increase in land values.

## 1.6. METHODOLOGY

The research technique and study design are critical components of research. A proper technique, as well as a description of the topic area's nature and processes that are used, must be used to analyse the study's aim. Employed in the selection of samples, data collection, and analysis the following four stages define the analytical tools used:

The research problems were first formulated, which was done with the assistance of a survey of the literature The review of literature aided in obtain a thorough understanding of the transportation sector scenario Maharashtra and the Pune district are two districts in India. This aided in understanding the state of transportation infrastructures, as well as the efforts taken to address challenges in this sector and the need to improve the current situation.

In the second stage, a more in-depth study of various literatures was conducted in order to comprehend the concept, elements and parameters taken into account to analyse the change in land values and land uses owing to the proposed metro corridor, and statistical methods to conduct such analysis.

The area was surveyed in the third stage, and a study of the area's character was performed alongside an examination of the obtained data. This survey data analysis found the drivers impacting real estate values, which were subsequently used in the hedonic regression model to evaluate the future influence of the Pune Metro Project. In this scenario, the study area is divided into three buffer zones. Buffer A is located up to 200 metres from the metro station, Buffer B is located between 200 and 350 metres, and Buffer B is located between 350 and 500 metres.
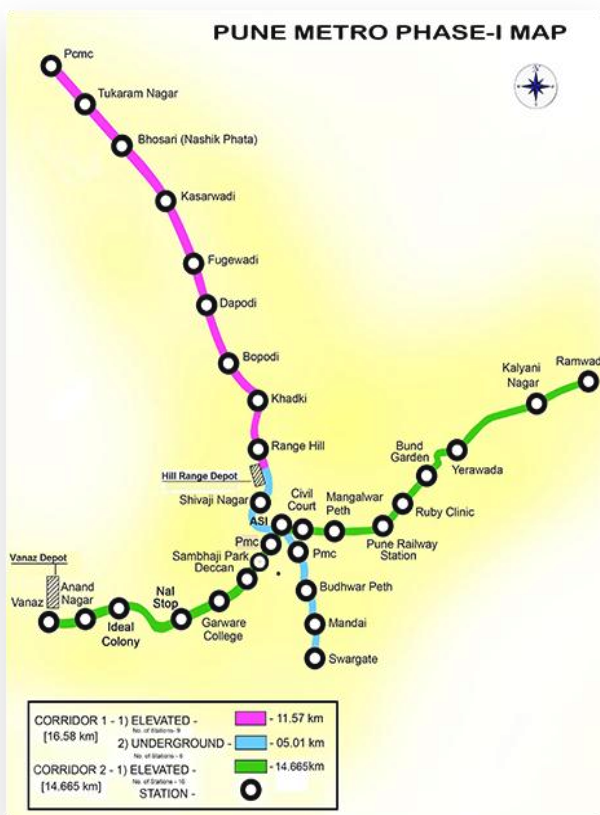
The fourth stage entails identifying the issues after analysing the data and providing solutions to overcome them, as well as the proposals. The effects of the project will only be investigated for one corridor, Ramwadi to Vanaz Metro. Certain factors, such as land rates in slum areas, median household incomes, and so on, cannot be evaluated in the context of the case study due to a lack of data.

## 2. STUDY AREA

The study area is one of the Metro Corridor 2 terminal stations, the Vanaz – Ramwadi Corridor. The metro route is highlighted in Dark green Color in Fig 1. The research area consists of the end station Vanaz depot and a 500-meter radius around it.

Data was collected and analysed in this 500-meter buffer zone surrounding the Vanaz Metro Station.Wards 10 and 11 are included in the study area.

**Fig -1**: Corridor 2



*Sorce: https://www.pngkit.com/downpic/u2w7y3q8o0t4u2e6_pune-metro-route-map/*

## 3. RESULTS

**Chart1**:Propertyrates.
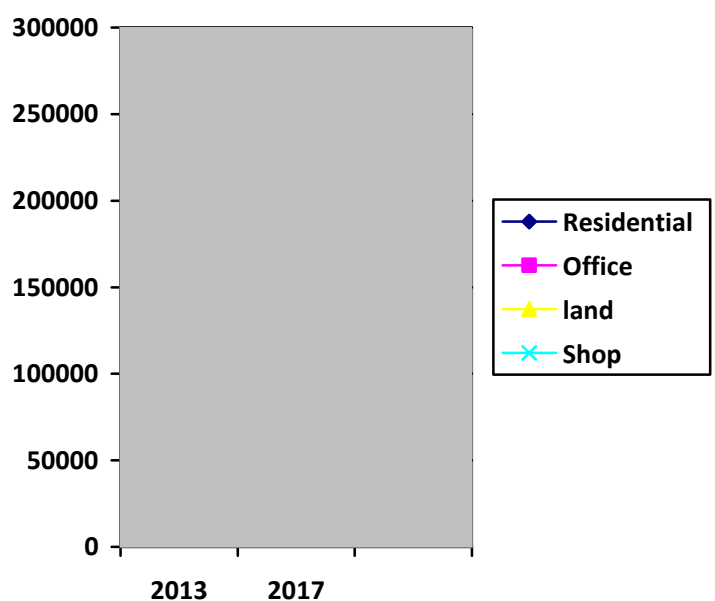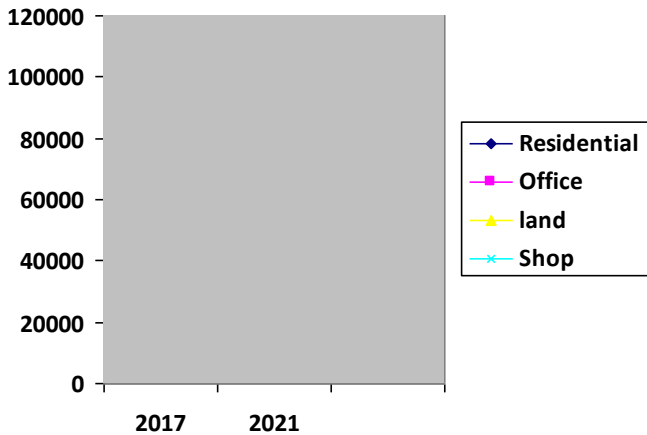


**Chart 2**: Ready Reckoner Rate

**Chart 3.** Ready reckoner Rates for 2021



According to the study, the average growth in the 'residential / industrial' rate is 63.69 percent. Similarly, the average increase in 'offices' rate is 55.59 percent. The average increase in the 'land' rate is 59.87 percent, while the average increase in the 'shop' rate is 49.65 percent. The proposed Pune metro will have a mixed effect on the real estate market of Pimpri Chinchwad, with some regions experiencing an increase in rates and others experiencing a fall in rates.

Following the collecting of all of the above-mentioned data, it is integrated with GIS and global mapper software for analysis.

## 4. CASE STUDY

The state of Maharashtra was one of the first to experiment with land-based fiscal instruments, with Mumbai being one of the first cities to implement them. Several projects, including the building of the Bandra-Kurla Complex, the Kalyan Growth Centre, public parking (CR2) at Nariman Point, and several city skywalks, have incorporated value capture as part of their execution.

In a more contemporary example, the development of Mumbai Metro routes and the monorail length from Chembur to Wadala included value capture measures to produce additional financial resources. The Maharashtra government has also approved the implementation of value capture methods for the new metro lines, which include: • additional FSI on payment of premium up to 500m from rail line; and 50% premium to MMRDA.

• Additional FSI on payment of premium upto 500m from rail line; 50% premium to MMRDA
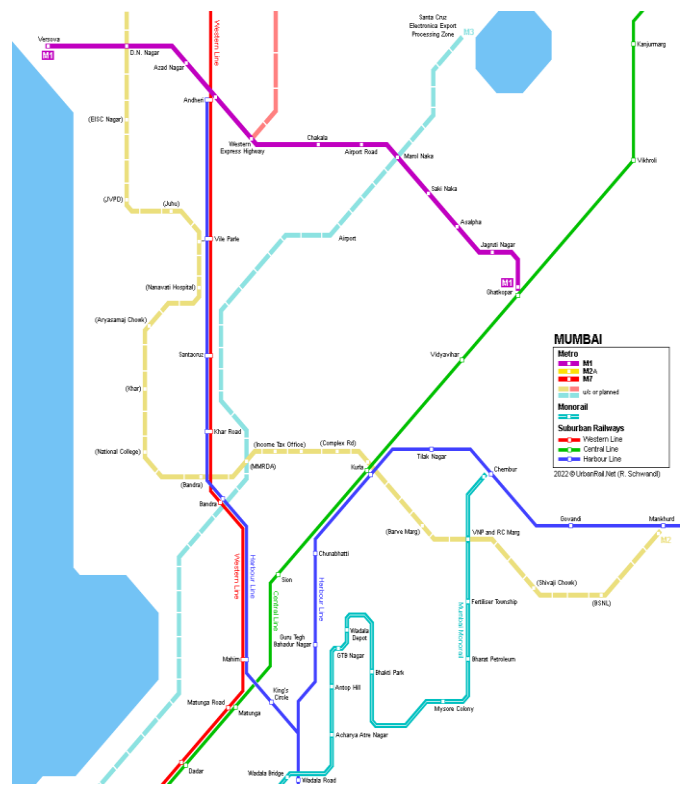
• 100% increase of Dev. Charges; 100% share to MMRDA
• 1% cess on Stamp Duty on all transactions, 100% share to MMRDA

*(Source: Mumbai Metropolitan Region Development Authority)*

Aside from these, all earnings from commercial development of vehicle depots, as well as advertising and parking fees, will be handed exclusively to the Development Authority (MMRDA).

The Government has also approved the establishment of an Urban Transport Fund in MMRDA to collect VCF income for this purpose. The development models utilised for the metro lines differ in that the first metro line was built and operated on a PPP model with Reliance, whilst the rest of the metro lines are planned and being built by an SPV: the Mumbai Metro Rail Corporation Limited (MMRCL).

**Fig 2**. Mumbai rail network.



*Source: www.urbanrail.net*

## 4. CONCLUSIONS

According to the statistical analysis, the property value of a residential property varies with the distance from the Metro station. Infrastructure development has the biggest influence in the first 200 metres from the metro station and steadily increases thereafter. This can be explained by issues such as noise pollution, heavy commuting, and so on. Factors such as dumping grounds and slum neighborhood's near residential houses tend to have a detrimental impact on property value. The view near the residential property has a beneficial but minor impact on the residential property values when compared to other aspects.

According to the hedonic regression study, the value of a residential property first declines, then climbs from a distance of 200 metres, and then slightly reduces from 350m – 500m. As a result, the value of residential property is proportional to its distance from the metro station. As a result, the degree of impact reduces with increasing distance.

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## BIOGRAPHIES

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