

# COMPARISON OF TRAVEL ASPECTS BETWEEN DIFFERENT MODES OF TRANSPORT

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**Abstract** - The purpose of this study is to determine the relationship of a newly introduced metro rail project and other Public and Personalized modes of transport. Bangalore is located in South India in the state of Karnataka. Bangalore is the administrative, industrial and cultural capital of the state of Karnataka. It has been recently renamed "Bengaluru". Bengaluru Metropolitan Area is 1307 sq.km consisting of the areas covered by the Bruhat Bengaluru Mahanagar Palike, surrounding villages. The city's population stands at 10,819,000 as of now. The various modes of transport in the city presently are two-wheelers, automobiles (cars) and public transport which comprise mainly of metro, buses, three wheelers (auto rickshaws) and taxis.

destination and the cost of travel required for all the above mentioned five modes of transport.

## 1.1 Study Area

The green line of Namma Metro, Majestic to Yelachenahalli & Majestic to Nagasandra. The line connects the northern, central and the southern areas of Bengaluru.

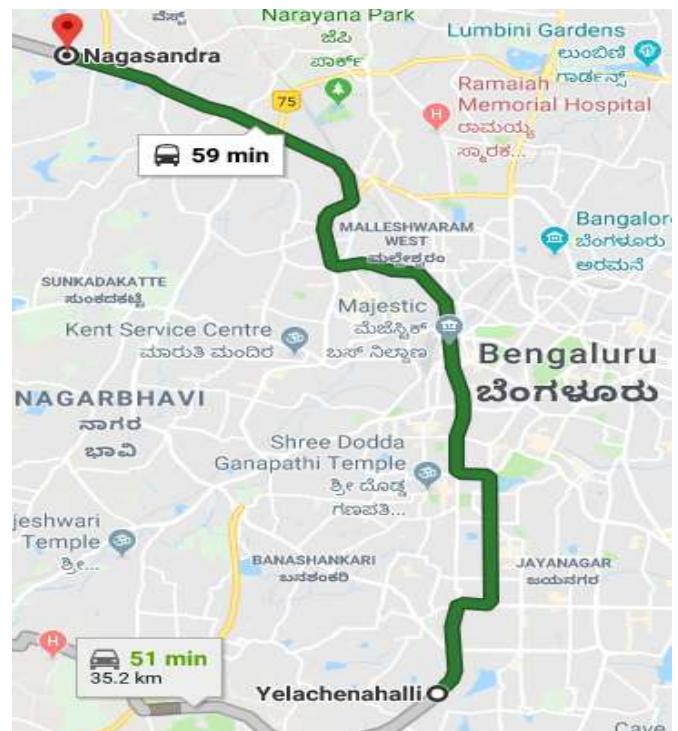


Fig -1: Location of study area

**Key Words:** Traffic study, Travel aspects, Travel time, Travel cost, Travel cost Metro, Modes of travel.

## 1. INTRODUCTION

Bangalore, One of the major popular cities in India. The hottest topic in this city these days is about the amount of time spent in the traffic jams in everyday life.

Reports says that, on an average people here spends more than 240 hours stuck in traffic jams every year and it is estimated by prof. Sreehari.

Most of them agree is of the opinion that it is because of the unplanned and rapid growth of the city. Since 1990s, IT firms started its expansion in the city and a large number of support industries have grown along with it, leading to a huge population from all over the country. Thereby, population is increased from 5.6million in 2001 to 8.7million in 2011. Today it is estimated to be around 12.476 million.

Our study is about comparing different modes of transport in Bangalore city with respect to different aspects like time, cost and distance. Due to time constraints the study and the required survey is restricted to the route of green line of metro which extends between Yelachenahalli and Nagasandra as destinations. For a greater accuracy of the study, travelling is done by 5 modes of transports which are metro, bus and auto which comes under public transports and 2-wheeler and 4-wheeler under private transports. And it is done for 7 days of the week which includes weekdays as well as weekends and also during the peak hours and off-peak hours. Collection of travelling time (including running time and stopping time), its distance between origin and

## 2. OBJECTIVE OF THE STUDY

The main objectives of the study are:

- Study consists of site visit and various data collection such as Travel Time, Travel Distance and Travel Cost between origin and destination with Different modes of Public and Personal transport.
- To compare the travel aspects between different modes of transport.
- To identify cause and purpose of each mode of transportation.
- To choose better option for transportation in well populated city.

## 2.1 METHODOLOGY OF THE STUDY

Study methodology has following steps:

- The various data collection will be for the duration of 7 days which includes both week days as well as weekends and also during peak hour and off peak hours in order to get the complete information of travel demand.
- Modes of travel preferred in this study between the origin and destination (Majestic to Yelachenahalli, Majestic to Nagasandra).

**Table -1:** Preferred modes of transport

PUBLIC TRANSPORT	PRIVATE TRANSPORT
METRO	2-WHEELER
BMTC	4- WHEELER
AUTO	

## 2.2 DATA COLLECTION AND ANALYSIS

The data collection was done at the time of travelling from Majestic to Yelachenahalli & Majestic to Nagasandra by all the five modes of transport Metro, BMTC, Auto, 2-Wheeler & 4-Wheeler during peak hour and off-peak hour for the duration of 7 days which includes both weekdays and weekends.

**Table - 2:** Route – Majestic to Yelachenahalli (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
BMTC	Monday	68'29"	11.5	22
	Tuesday	60'27"	11.5	22
	Wednesday	60'13"	11.5	22
	Thursday	68'42"	11.5	22
	Friday	62'08"	11	20
	Saturday	58'24"	11	20
	Sunday	67'31"	11.5	22

**Table - 3:** Route – Majestic to Yelachenahalli (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
BMTC	Monday	58'4"	11.5	22
	Tuesday	57'39"	11	20
	Wednesday	55'40"	11	20
	Thursday	65'11"	11	20
	Friday	57'12"	11	20
	Saturday	50'21"	11.5	22
	Sunday	57'52"	11.5	22

**Table - 4:** Route – Majestic to Yelachenahalli (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
Auto	Monday	36'11"	11	162
	Tuesday	39'28"	11	162
	Wednesday	46'6"	11	170
	Thursday	59'35"	11	140
	Friday	51'7"	11	162
	Saturday	69'55"	11	194
	Sunday	34'30"	11	162

**Table - 5:** Route – Majestic to Yelachenahalli (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
Auto	Monday	52'19"	11	170
	Tuesday	37'8"	11	165
	Wednesday	41'52"	11	160
	Thursday	49'20"	11	164
	Friday	42'12"	11	155
	Saturday	45'34"	11	171
	Sunday	38'36"	11	160

**Table - 6:** Route – Majestic to Yelachenahalli (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
Metro	Monday	19'18"	10.6	30
	Tuesday	19'30"	10.6	30
	Wednesday	19'32"	10.6	30
	Thursday	19'41"	10.6	30
	Friday	19'33"	10.6	30
	Saturday	19'23"	10.6	30
	Sunday	19'16"	10.6	30

**Table - 7:** Route – Majestic to Yelachenahalli (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
Metro	Monday	19'41"	10.6	30
	Tuesday	19'51"	10.6	30
	Wednesday	19'38"	10.6	30
	Thursday	19'50"	10.6	30
	Friday	19'33"	10.6	30
	Saturday	18'57"	10.6	30
	Sunday	19'9"	10.6	30

**Table - 8:** Route – Majestic to Yelachenahalli (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
2-wheeler	Monday	36'53"	11	18
	Tuesday	36'18"	11	18
	Wednesday	34'27"	11	18
	Thursday	32'40"	11	18
	Friday	37'46"	11	18
	Saturday	30'1"	11	18
	Sunday	28'47"	11	18

**Table - 9:** Route – Majestic to Yelachenahalli (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
BMTC	Monday	48'57"	12	20
	Tuesday	41'56"	12	20
	Wednesday	56'38"	12	20
	Thursday	56'17"	12	20
	Friday	56'55"	12	20
	Saturday	54'26"	12	20
	Sunday	53'52"	12	20

**Table - 13:** Route – Majestic to Nagasandra (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
2-wheeler	Monday	34'48"	11	18
	Tuesday	34'28"	11	18
	Wednesday	32'39"	11	18
	Thursday	30'14"	11	18
	Friday	34'29"	11	18
	Saturday	13'53"	11	18
	Sunday	28'2"	11	18

**Table - 10:** Route – Majestic to Yelachenahalli (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
BMTC	Monday	46'11"	12	20
	Tuesday	39'8"	12	20
	Wednesday	47'41"	12	20
	Thursday	54'37"	12	20
	Friday	54'8"	12	20
	Saturday	53'50"	12	20
	Sunday	50'22"	12	20

**Table - 14:** Route – Majestic to Nagasandra (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
4-wheeler	Monday	36'36"	11	51
	Tuesday	34'34"	11	51
	Wednesday	39'39"	11	51
	Thursday	39'26"	11	51
	Friday	40'23"	11	51
	Saturday	44'42"	11	51
	Sunday	31'47"	11	51

**Table - 11:** Route – Majestic to Yelachenahalli(Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
Auto	Monday	44'31"	12	196
	Tuesday	42'26"	12	183
	Wednesday	39'55"	12	185
	Thursday	44'26"	12	170
	Friday	43'9"	12	165
	Saturday	39'6"	12	190
	Sunday	61'2"	15.2	220

**Table - 15:** Route – Majestic to Nagasandra (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
4-wheeler	Monday	35'11"	11	51
	Tuesday	37'24"	11	51
	Wednesday	37'51"	11	51
	Thursday	37'55"	11	51
	Friday	34'29"	11	51
	Saturday	38'44"	11	51
	Sunday	30'58"	11	51

**Table - 12:** Route – Majestic to Nagasandra (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
Auto	Monday	37'29"	12	185
	Tuesday	39'7"	12	190
	Wednesday	43'53"	12	190
	Thursday	46'6"	12	190
	Friday	47'7"	12	175
	Saturday	48'35"	12	175
	Sunday	58'29"	15.2	200

**Table - 16:** Route – Majestic to Nagasandra (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
Metro	Monday	28'43"	13.7	38
	Tuesday	26'23"	13.7	38
	Wednesday	26'25"	13.7	38
	Thursday	26'21"	13.7	38
	Friday	26'17"	13.7	38
	Saturday	26'46"	13.7	38
	Sunday	26'29"	13.7	38

Table - 17: Route – Majestic to Nagasandra (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
Metro	Monday	26'58"	13.7	38
	Tuesday	25'58'	13.7	38
	Wednesday	26'5"	13.7	38
	Thursday	25'3"	13.7	38
	Friday	25'57"	13.7	38
	Saturday	26'10"	13.7	38
	Sunday	26'56'	13.7	38

Table - 18: Route – Majestic to Nagasandra (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
2-wheeler	Monday	31'2"	12	23
	Tuesday	31'36"	12	23
	Wednesday	32'34"	12	23
	Thursday	36'14"	12	23
	Friday	34'51"	12	23
	Saturday	30'1"	12	23
	Sunday	26'44"	12	23

Table - 19: Route – Majestic to Nagasandra (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
2-wheeler	Monday	29'37"	12	23
	Tuesday	29'56"	12	23
	Wednesday	30'28"	12	23
	Thursday	32'49"	12	23
	Friday	32'8"	12	23
	Saturday	28'21"	12	23
	Sunday	24'16"	12	23

Table - 20: Route – Majestic to Nagasandra (Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (rs)
4-wheeler	Monday	46'8"	12	60
	Tuesday	44'40"	12	60
	Wednesday	42'34"	12	60
	Thursday	44'1"	12	60
	Friday	45'33"	12	60
	Saturday	43'50"	12	60
	Sunday	42'26"	12	60

Table - 21: Route – Majestic to Nagasandra (Off Peak hour)

Mode of transport	Weeks	Total time taken	Distance (km)	Cost (Rs)
4-wheeler	Monday	41'27"	12	60
	Tuesday	43'20"	12	60
	Wednesday	41'13"	12	60
	Thursday	42'9"	12	60
	Friday	41'18"	12	60
	Saturday	41'40"	12	60
	Sunday	42'50"	12	60

Analysis

Time Analysis

Route – Majestic to Yelachenahalli (Weekdays)

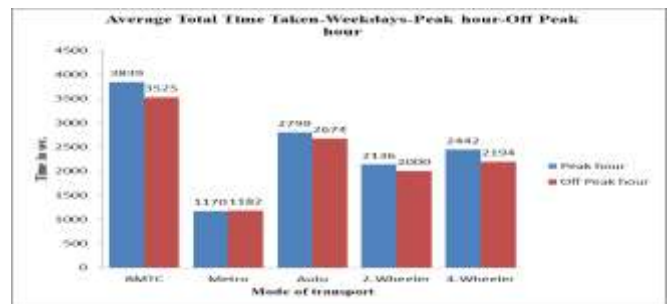


Chart -1: mode of transport vs time in seconds

Route – Majestic to Yelachenahalli (Weekends)



Chart -2: mode of transport vs time in seconds

Route – Majestic to Nagasandra (Weekdays)



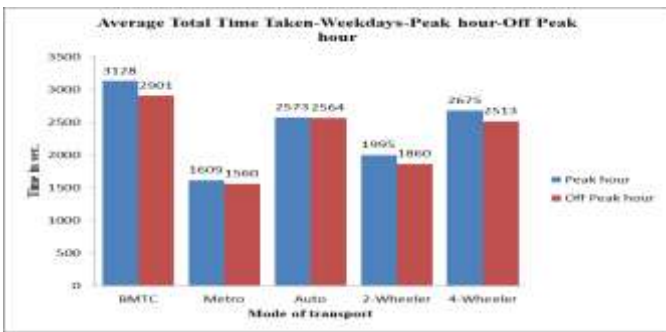


Chart -3: mode of transport vs time in seconds



Chart -4: mode of transport vs cost in rs.

Route – Majestic to Nagasandra (Weekends)

Distance Analysis

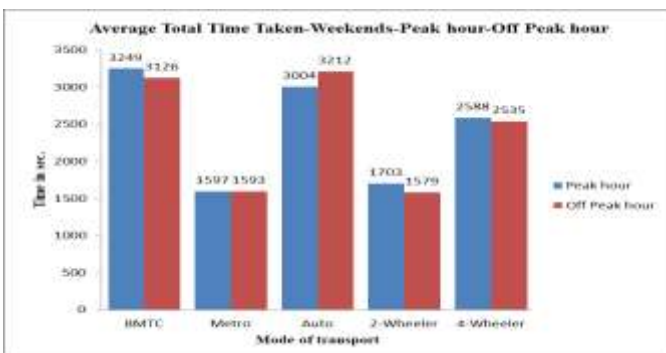


Chart -4: mode of transport vs time in seconds

Route – Majestic to Yelachenahalli

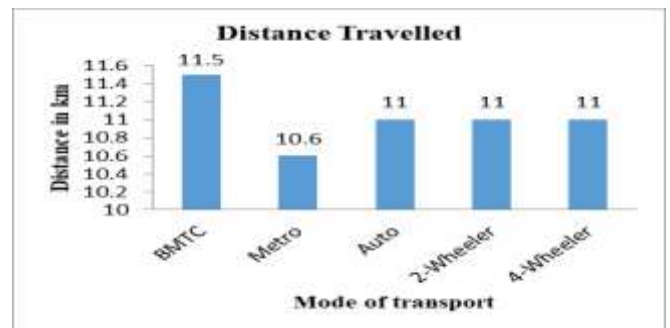


Chart -5: mode of transport vs distance in km.

Cost Analysis

Route – Majestic to Yelachenahalli

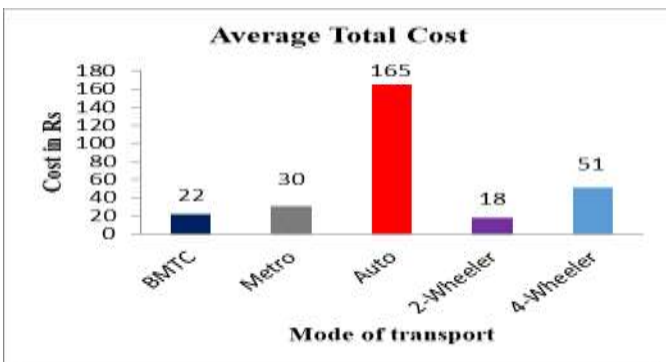


Chart -3: mode of transport vs cost in rs.

Route – Majestic to Nagasandra

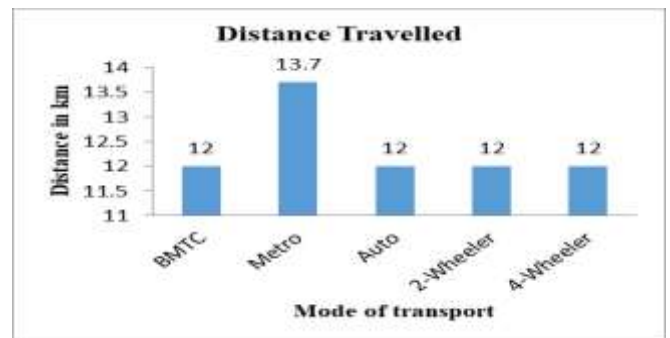


Chart -6: mode of transport vs distance in km.

3. CONCLUSIONS

Time Analysis

When we travel from Majestic to Yelachenahalli & from Majestic to Nagasandra in peak hours & off peak hours:

- The average total running time of all the 7 days of the week, BMTC is higher than other modes of transport. But in case of Metro it takes lesser time among all other modes of transport.

Route – Majestic to Nagasandra

- The average total stopping time of all the 7 days of the week, BMTC is higher than other modes of transport. But in case of Metro it is lesser.
- The total time taken to reach Yelachenahalli and Nagasandra of all the 7 days of the week, BMTC is higher than other modes of transport. But in case of metro it takes lesser time to reach.

#### Cost Analysis

When we travel from majestic to Yelachenahalli & from Majestic to Nagasandra in peak hours & off peak hours:

- The cost of travel by auto is higher and lesser in case of 2- wheeler.

#### Distance Analysis

When we travel from Majestic to Yelachenahalli:

- We have to cover 11.5 km if we are travelling by bus, but we have to cover only 10.6 km if we are travelling by Metro.

When we travel from Majestic to Nagasandra:

- We have to cover 13.7 km if we are travelling by Metro, but we have to cover 12 km if we are travelling by BMTC, Auto, 2-Wheeler & 4-Wheeler.



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#### BIOGRAPHIES



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