CHAPTER - VI

SOLUTION AS A VIABLE DESIGN-PEOPLE’S PERCEPTION

“Research is creating new knowledge”.  
Neil Armstrong

“Research is to see what everybody else has seen and to think what nobody else has thought”.  
Albert Szent-Gyorgyi

6.1. Introduction:
This chapter would cover the methodology followed; analysis of information collected from primary and secondary sources and inferences/results would be deduced and collated. The analysis on the Socio-Culture of Bengaluru and the reasons for the changing trends is brought with greater details in this chapter. Three separate surveys have been conducted by administering a questionnaire to three different groups of people: people using the metro, people living in the vicinity of metro line and shop owners in vicinity of metro line. The outcome of this survey has accounted the changes that have taken place on the streets of Bengaluru through the last 30 years.

6.2. Methodology

6.2.1. Data Collection:
Sociometric Assessment has been used as they measure factors like social attitude, home environment, adjustment, group behaviour etc. This research has also used a combination of qualitative and quantitative methods. The method of interview is used extensively in the field of social research as it helps in-depth study. Respondent may be hesitant to part with personal data in questionnaires but one can gain confidence of the interviewee and procure such data. Interview may be formal or informal. In this research a formal/structured interview was conducted with BMRC officials and a combination of formal and informal interview was conducted with metro users. Keeping the hypothesis and research objectives in mind the interview questions had been framed.
Interviews have been conducted of BMRC officials, general public using the metro in India and abroad, sociologists and urban planners. Observations have been made as a participant traveller on the Namma metro and 5 other metros- Delhi, Bangkok, Japan (one of the busiest metro in the world), Hongkong and Singapore. In Namma metro observations were made of people’s behaviour right from reaching the station to descending the metro rail. Visual documentations have been made where ever possible as metro is a high security zone.

The quantitative study has been done using the survey method. Data collection in the survey method is done through questionnaires which may be sent online or door to door survey is conducted to get them filled. In this research both methods have been employed. The possibility of people filling the responses is less when it is sent online. The questions are structured using various types: dichotomous questions (Yes/No), Leading question (If yes, then why?), Open end questions and Multiple choice questions. The multiple choice rating methods questions used may vary, typically ranging from three- to five-point Likert-type responses (Agree, Neutral and Disagree). Apart from these methods data may be gathered from quantitative National Databases like General Social Survey (GSS), Census, etc.

6.2.2. Description of research design:
There are various types of Research Design, but only the most suited ones to this study have been mentioned: Exploratory, Descriptive and Casual. Since the research has to adopt the multi-disciplinary approach, several research methods were employed for an effective analysis.

6.2.2.1. Research Design Used in Study:
The first phase included the Exploratory Research Method. Exploratory Method has been the most useful in the early stages of research, as there has no such study done in past. The aim of this research method is to uncover any variable that may be relevant to the research (Ref: Easey, 2002: 74). Here it has identified and explored the meanings of suburbs, their growth and the impacts and changes in the area due to various factors, one of them being the Metro networking.
Descriptive research Method provides an accurate description of the variables uncovered in the exploratory stage. Descriptive research designs help provide answers to the questions of who, what, when, where, and how associated with a particular research problem; a descriptive study cannot conclusively ascertain answers to why. The subject is being observed in a completely natural and unchanged natural environment with true experiments. Thereby Descriptive studies can yield rich data and this approach collects a large amount of data for detailed analysis. (Anastas 1999).

This is followed by Qualitative and Quantitative Research Method. Data here are usually obtained from ordinary data sources or from surveys. Qualitative Research Method, in this research helps in understanding of human behaviour and their responses to the environment in which they live and what are the changes that have influenced them with a socio-cultural outlook. This data has been collected through interviews of people. Quantitative Research Method has been carried out by questionnaire survey method of people using the Metro, people living in the vicinity of Metro line and shop owners in vicinity of Metro line. The questionnaires are attached in Annexure-III. Casual Research Design has been used to determine the relationship between variables. Causality studies may be thought of as understanding a phenomenon in terms of conditional statements in the form, “If X, and then Y.” This type of research is used to measure what impact a specific change will have on existing norms and assumptions. Causal effect occurs when variation in an independent variable, leads to or results in variation in another phenomenon, the dependent variable.

Case Study Method of research design has been also used to compare similar studies to this research. Case studies of the cities like Delhi and London has been referred, to identify the socio-cultural impact of Metro on the streets/suburbs along its line in these cities.

6.2.2.2. Sample Size and sampling Method
The two areas/suburbs of study initially selected were Bypanahalli-Indranagar in East and Jayanagar in West connected with the city centre/CBD, the MG Road. But as the metro project got delayed the response from people of Jayanagar was not satisfactory.
for the study, as there were no metro users, hence the new area on the newly launched line Peenya to Yeshwantpur was chosen for study. The sample design used for the pilot study was Non-probability Sampling Method using the Convenience Sampling Method. For the later study it was proposed to use Probability Sampling and Randomization with Simple Random Sampling Method. This would ensure that all the members of the population are included in the list and then randomly select the desired number of subjects. But there exists no list as the population traveling on the metro fluctuates every day. But however Probability Sampling and Randomization with Simple Random Sampling Method was used for shops in the vicinity and residents in the vicinity. The sample size for the questionnaire survey was 100 Metro commuters, 50 owners/ workers in the vicinity and 50 residents in the vicinity. There are about 1000 commuters in a day on the MG road- Bypanahalli line, hence 10% of the population was chosen for survey of Metro users. However, the percentage of people owning/working in the shops in vicinity was by and large the same percentage, but people living in the vicinity was a much less percentage.

A visual representation of the area selected has been shown through the maps. Only the green lines show where the Namma Metro is functional.

Fig 73: The circled are the functional routes as on 30th September 2014.
Fig 74: Enlarged version of the functional routes shown in green

Fig 75: Peenya-Malleshwaram function route blown up
6.2.2.3. Data Analysis Method

The data has been analysed in different methods. The open ended questions from Questionnaire, Observations and Interviews have been analysed separately to understand the social- psychology of people living in the suburbs of two lines: MG Road-Byapanahalli and Peenya- Yeshwantpur. The quantitative questions in the questionnaire have been analysed using the statistical Method of analysis (SPSS software). The Independent variable Metro networking has been cross-tabbed with the Dependent variables like mixed demography and culture due to migration; BPO culture; concept of nuclear families, living on credits/EMI’s and eating out on weekends; Global exposure and awareness; impact on retail and fashion buying and awareness in the streets/ new suburbs; Safety of women on streets and neighbourhood and impact on physical structure like traffic, air and noise pollution; cutting of trees; concrete and glass structures of apartments and office buildings; change in urban land-use from agriculture to suburb; concept of community living. A pilot study has been conducted and its analysis discussed in 6.3.1.
6.2.3. Development of instrument or method, reliability and validity of instrument or method

The instruments developed to do this research include case study method, qualitative and quantitative data collection. Qualitative data has been collected through interviews and observations. Quantitative data has been collected through questionnaires based on the hypotheses to be validated. The Independent variable here is Metro networking and the Dependent variables are demography and culture due to migration; BPO culture; concept of nuclear families, living on credits/EMI’s and eating out on weekends; Global exposure and awareness; impact on retail and fashion buying and awareness in the streets/ new suburbs; Safety of women on streets and neighbourhood and impact on physical structure like traffic, air and noise pollution; cutting of trees; concrete and glass structures of apartments and office buildings; change in urban land-use from agriculture to suburb; concept of community living.

The characteristic of a good test can be classified in two categories: (1) Practical criteria which includes factors like time, cost, purpose, ease of administration, ease of interpretation and so on, (2) Technical criteria which includes factors like validity, reliability, and standardisation and so on. Once the test is conducted its validity and reliability are equally important. According to Leo J. Cronbach, “Validity is the extent to which a test measures what it purports to measure”. Validity is the watch word and foundation stone over which the entire superstructure of testing is based. There are two approaches to validity: logical and deductive. Logical as the name indicates is based on logical analysis. Deduction follows from general to particular. The trait to be measured must be clearly defined. The next important aspect is reliability. Reliability is the consistency of a person’s score on a series of measurement. Test reliability indicates the extent to which individual differences in the test scores are attributed to chance errors of measurement and the extent to which they are attributable to the true differences in the characteristics under consideration. More technically, every measure of test reliability denotes what proportion of total variance of the test score is error variance. (Dr. Kumar 1993:180-188)
6.2.4. Administration of instrument or method:
The survey was carried out at various places in Bengaluru along the metro line including the functional and non-functional areas where the construction process has begun. Questionnaires were distributed and interviews conducted along the functional metro areas but observations were made of functional and non-functional areas. Opinion of citizens of Bengaluru was collected through on-line questionnaires, general opinion of designers, architects and urban planners were also collected online. Interviews of BMRC officials were also conducted to get their opinion and to document the story from the makers.

6.2.5. Coding of data
Coding is the most important part of any scientific research. If the raw data collected is well coded half the battle is won. On this blank spreadsheet data may be entered. Each column represents one variable (eg. Gender, Income, etc.). Each row represents one subject (opinion of Person1-row1, opinion of Person 2-row2, etc.). Coding decisions should be taken at the questionnaire designing stage; this would help pre-code the questionnaires and would help in tabulation as one can straight away pick from questionnaire.

Often, there is a need to code categorical variables in numeric format. For example, male and female can be coded as 1 and 2, respectively. To reduce confusion, it is recommended that one uses value labels. For the example of gender coding, Value: 1 would have a corresponding Value label: male. Similarly, Value: 2 would be coded with Value Label: female.¹

6.3. Analysis
The data obtained from study maybe in two forms: either as number/quantitative form or as words/qualitative form. When it is in numerical form then a descriptive statistics method is used to analyse the data. These descriptive statistics include measures of central tendency within a sample (mean) and measures of the spread of scores within a sample (range). In any study two things might be true: (1) there is a difference (experimental hypotheses) or (2) there is no difference (null hypotheses). Finally there are important issues relating to the validity of the findings obtained from the study.

¹ [http://www.psych.utoronto.ca/courses/c1/spss/page2.htm](http://www.psych.utoronto.ca/courses/c1/spss/page2.htm) (12-09-2014)
Investigators who collect qualitative data use several different kinds of analysis and so only general indications of what can be done with such data is discussed here. The investigator here too has used both qualitative and quantitative forms of analysis using Excel and SPSS as software for analysis. The questionnaires used for the survey were for three sets of people: the metro users, the shopowners/workers and the people living in the vicinity of Metro rail and can be seen as Annexure-III. Care had been taken during the filling of questionnaires and interviews to eliminate bias. Observations have used visual documentation to state facts and avoid bias.

**Analysis for few research questions with a smaller group in order to find out the social structure and outlook of citizens of Bengaluru:**

(1) **Are you in joint family/nuclear family?**

![Bar chart showing distribution: Joint family 5, Nuclear family 15, Can't say 0.](chart1)

**Analysis:** Most of the people lived in nuclear families

(2) **How many times do you visit temple/mosque/church?**

![Pie chart showing distribution: daily 30, once a week 20, once in 2 weeks 10, once a month 5.](chart2)

**Analysis:** Most people visit on occasions
(3) Do you celebrate festivals alone/ with friends/ with relatives?

Analysis: It was an equal divide between family and friends. People do not celebrate festivals alone. These days’ people prefer to stay in gated communities and these communities celebrate festivals as a group function.

(4) Do you feel safe in your area when it’s dark?

Analysis: Most of the people felt safe in their area even after the sun went down.

6.3.1. Data analysis of the study done with regards to the impact of Metro

Data analysis and feedbacks of interviews with BMRC officials, sociologists, urban planners and general people has been summed up here. The analysis on the Socio-Culture of Bengaluru and the reasons for the changing trends is brought with greater detail here through observations, interviews and surveys. Three separate surveys have been conducted by administering a questionnaire to three different groups of people:
People using the metro, People living in the vicinity of metro line and Shop owners in vicinity of metro line. Structured interviews have been conducted with few Metro officials.

The analysis and feedback of the interview of BMRC has been summed up here: The objective of BMRC is to bring fast, comfortable safe and affordable mass transportation system, which in turn will contribute to further development and prosperity of Bengaluru. “Namma Metro- A People friendly transit… Linking the city with world class connectivity…” Namma Metro, a special purpose vehicle was a joint venture with 50% GOI and 50% GOK. On discussion certain facts which were a myth so far, were brought forward.

London metro was taken as a reference case and not Kolkata Metro. The latter was not taken as a benchmark because Kolkata Metro is an old Metro line and the technology used there is very old. It used a cut and cover technology, where the ground was dug, tunnel laid and then the mud was covered. It is cumbersome and time consuming; hence it is not recommended in present day. Trains used were also primitive there, with no regenerative breaking technology. Therefore tunnelling technology was emulated in London style; however trains (coaches) were more on Singapore and Bangkok style. As per government instruction only 25% of trains could be imported rest 75% were to be built in India. Trains were built by BEML. One of the main concerns of Namma metro was that safety was given utmost importance with better energy efficiency and eco-friendly trains. The decision to go over-ground or underground was made based on the terrain and land availability. BMRC tried to lay the lines with least amount of displacement and inconvenience to public. Wherever there was space or the road was with a divider it was elevated (viz. MG Road) but when there was a space crunch the track was laid underground (viz. Majestic).

Inspite of effective usage of ‘state of the art technology’ BMRC has not been able to deliver on time owing to several beauracratic, and civic reasons and political situations. There has been uncertainty due to Civic body Litigation. As quoted by one of the officials, “The main difference between and India and China is that in India we ask people’s opinion and take their consent leading to delay, whereas, in China they just announce, the metro line would pass through these sites please vacate…and
people do the needful.” There were certain topographical and geographic challenges also which led to the delay of the project. When dug underground heavy rocky bed came as a surprise and delayed the underground work. Phase I was proposed to be completed in December 2013 but it would now get completed in 2015 as stated in June 2014, but the recent updates in newspaper show that it may be completed in 2016.

Despite all the delays the metro officials claim that all matters of concern were handled with utmost caution by BMRC to cause minimal inconvenience to public. During the construction stage utmost care was taken to avoid disruption of various services like: water supply, sewage, electricity and telephone. A substitute line was laid parallel to the existing line. All lines were laid underground. Only a day or maximum two days of disruption happened to transfer or do the utility diversion from old line to new line. Sufficient notices were sent to the residents in those areas. The residents in those areas were notified through newspaper by the individual service providers. BMRC was sensitive to the loss of trees due to laying of metro line. They gave the saplings money to BDA, BBMP and the Forest Department to plant trees. Public convenience has been planned for. Feeder busses have been planned to provide the metro users a free flow from their residence to work and back. It’s the dream of BMRC to have a station at every 500 mts. If this happens it would be on par with International metro network lines.

The outcome of the survey has accounted the changes that have taken place on the streets of Bengaluru through the last 30 years. Survey Reports were of three sections of society: (1) shop owner/ worker, (2) people using the metro and (3) people living in vicinity to metro stations.

Pilot study analysis of Shop owner/worker showed that the business was affected during and after Metro rail being in place. It affected negatively during first case and positively during second case. About 50% of the shop owner/ worker felt that Metro does not spoil the beauty of Bengaluru and it is much required. They were hopeful that the economy and environment will improve once it is fully functional. Pilot Survey report of Metro users reveal, they find Metro the best means of transport in Bengaluru. It is cheap and pollution free. Majority of the Metro users feel it does not
spoil the beauty of the city unlike architects and urban planners. Surprisingly to them comfort overrules aesthetics. They are somewhat satisfied by the look and feel of the station but have suggestions that fast food joints and Wi-Fi facility may be added at the stations. These have been added after the pilot study was made. Metro users believe that Metro is a boon to cultural mix as there is no difference in social class by the users, all pay the same fare and all sit along each other.

Recently an article was circulating in social media that British Prime minister was caught on cameras standing in MRT, a proof that there is no difference in social class between users. Pilot survey report of people living in vicinity of metro stations revealed that they mostly travel in 4-wheeler, 2-wheeler or auto as currently the metro does not suffice their needs. They are hopeful that Metro will be a boon to them once functional as it will solve the entire traffic problem. They are also very satisfied by the look and feel of Metro and Metro stations. They felt it was a matter of pride and the metro shows signs of living in an advanced city. Their major expectations at the station were of car-parking, ATM and feeder bus connectivity.

Since many of the survey respondents were women they expected a woman compartment. They also believed that the metro will improve the economy of the area, of which they can already see the impact. The rental rates and property value have gone up in the areas around the metro stations. They also believe that the metro has brought in cosmopolitan culture as a mixed bag of people have moved in to the newly constructed apartments, but they feel due to this change the social life has improved. The study also revealed that at present the metro does not have a very significant impact on all the streets of Bengaluru but once functional it would positively make an impact as seen in the case study of Delhi. However the delay of Namma Metro has a big question of “How would it accommodate the growth in population?” PHPDT report says that by 2020 30% population would be in cities.

6.3.2. People’s opinion over Metro globally

Feedbacks and opinion of people were taking through help of various social media sites, through mails, newspapers and search engines. Aditya a Fashion Technologist and an active member of the student society states;” Metro acts as a fast and effective
transportation, being a public transport it helps in checking pollution and in turn aiding environmental conservation. It acts as a confluence of socio-economic and cultural forum as Bengaluru is getting more and more cosmopolitan with each passing day thus enabling a mix of heterogeneous groups. It aids business activities by providing a platform for advertisements benefiting both advertiser and operator. As people from all walks of life barring poor travel in metro, it creates a fertile opportunity for getting along of people at different strata and exchange of plural ideas. It maximises returns for the operator in the long run as the technology inhibits ticketless travellers.

A few Metro stations could be used to showcase India's rich art, architecture and culture. For instance: murals, paintings, handicrafts, Nagar & Dravidian styles of temples, music and so on. To ensure inclusive growth and development and aid a vibrant and egalitarian India, operators should charge lesser/subsidized rates from the poor. This will help the poor to come in terms with the have-nots faster than usual and would also add in socio-cultural-economic diversity. The inside body space if free could be used to promote noble values and imbibe nationalism like "Helping poor is akin to serving God" and so on". Tighter security arrangements through CCTV cameras and a few linked emergency switches like police, ambulance, etc should be put in place to help save the vulnerable classes. Metro rail can be used to save lives by acting as fast driven ambulances. Lifts should be set up at each station to take care of emergency cases as roadways takes a lot of time and even results in undesired outcomes.

Feeders to metro stations should be introduced for maximizing coverage. It would help people from nearby localities to have faster access of transportation. Train timings should be in sync with the traffic load of specific routes. It helps both the travellers and operator by boosting revenues. Gradually, it should be expanded to peripheral areas like Hosur, Hoskote, Ramnagaram, Doddaballapur to decongest Bengaluru on the lines of NCR. Management of metros should be made more citizens centric like availability of seats as per traffic, effective grievance redressal mechanism, citizen charter and so on". 
Architect Yebin Srinivas, Principal Head, AEDAS, UAE states that, “The Elevated metro can be in general regarded as a complete monstrosity or aesthetic horror. The alignment completely disregards the fact that it runs in parallel to existing buildings that are of lesser or equal height, hence completely distorting and muting the backdrop. But having said that, a city like Bengaluru would not be able to afford a complete underground system; let’s rephrase, given the current political and economic systems available in the country, a completely underground system would have been over ambitious.

Numerous individuals have raised the point that elevated rail is innately unpleasant, and that first world countries around the globe prefer to construct subway systems as a substitute. Essentially, the facts prove otherwise, as different countries face budget constraint a clear trend has risen towards the use of integrated elevated rail as is the case in the photograph below in Holland.

Fig 77 & 78: Showing aesthetically designed metro stations, Holland and Dubai

In the first place let’s begin with the idea of the structure versus the facade. Numerous home owners know that a house facade is not a reflection of its material bones. The metro at this juncture is monolithic concrete piers and track way, like seeing a house without its facade. The concrete and steel bones of an elevated structure are practically never (excluding in the case of Brutalist architecture) seen toward the end of the construction. But in the case of Bengaluru metro the completed stations with its oversize concrete and steel members are more brutal than the viaduct itself. It has not completely failed to integrate into the surroundings nor does it have any particular urban statements. Take in the case of Dubai metro, where the station in itself is a
strong architectural statement and succeeds in creating an identity and a visual landmark in itself.

Fig 79: Showing the incorporation of metro in aesthetical setting even when it runs through the city like Bengaluru, Dubai

An alternate intriguing choice is seen in France's elevated passenger rail. Here the elevated system and piers have been secured with a facade, however the areas between the piers have likewise become interior spaces shielded from the weather which could be a part of the train station or could be changed over to retail store fronts and popup stores also.
An alternate technique for combination happens totally separate from the rail line itself. It includes the structures that encompass the framework. The psyche changes over what our eyes see in exceptionally fascinating ways. Frequently something that would be seen as "revolting" can get to be wonderful when seen as a whole with its surroundings just like a Monet painting".

Fig 80: France’s elevated passenger rail

Fig 81: Dubai Metro Station
A rail line being set before a 2-story 1970s construction, sticks out as a blemish. The whole view is plain old obnoxious because the piers and track become over driving and there is nothing to draw your eye away other than the concrete monster. Nevertheless, when an arrangement of 300’ or 400’ elevated structures with special construction modeling are set behind the rail, the framework seems reduced and less overwhelming; same as in the case of Dubai Metro.

![Architectural Aesthetics, Dubai Metro](image)

**Fig 82:** Architectural Aesthetics, Dubai Metro

Sometimes the architecture can really be consolidated into the rail as is the situation with the London Docklands Light Rail. Structures can embrace or moderately cover the line making an elevated subway. The additional cost of spans over the rail are satisfactory for a developer when this design returns far more prominent bulk potential and consequently more lease, rental, or sales space.

![Architectural Aesthetics, London Metro](image)

**Fig 83 & 84:** Architectural Aesthetics, London Metro
To conclude, and most essentially, landscape architecture will be the key to how we watch the framework. Going to any development site whether skyscraper or subdivision will highlight one fact, a half manufactured site has no trees. We are seeing a half constructed site at this moment along the course, however, it’s considered to be completed, pretty much as a house with a plain grass (or turf) front looks off putting and uninviting, a metro with construction fence and dirt looks un-walk capable and unappealing. Coordinating pedestrian walkways and trees will be the best early venture to giving the system a sense of place.

6.3.3. Data Collected Through Newspapers and Observations

Some of the highlights collected from the newspaper have been listed which actually are in sync with the observations made over past 3 years, starting from October 20th, 2011 when the project was inaugurated. The logo for metro was designed by Jayant Jain and Mahendra Kumar inspired from the Rangoli art of Bengaluru.

![Fig 85: Traditional Rangoli](http://muthyalamuggulu.blogspot.in/2010/07/intermediate-level-2.html)  

![Fig 86: Traditional Rangoli](#)  

August 2012 TOI reported metro stations would have pharmacy, laundry, hair salon, florist and food court at various stations. Pharmacy, laundry and coffee vending machines are present in MG Road and Trinity circle.

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Fig 87: Pharmacy at trinity Circle station

Fig 88: Coffee vending machine at trinity Circle station
Oct 2012 TOI reported that they would have cycles for rent but today there is no trace of them. November 2012 saw an agitation by slum dwellers on Magadhi Road, who claimed that BMRC did not compensate them for displacement as reported by DNA and they made an attempt to emulate them. November 2012 reported historical revelations: 2 canons of Tipu sultan period were buried 4’ deep underground. Meanwhile tunnels were being dug by experts from 7 countries and in November 2012 TOI reported a dispute due to Ambedkar’s statue near Vidhan Soudha which led to an 8months delay in the project finally the court gave a verdict on 25th January 2013 that the statue must not be touched. By 2012 December metro had lost 20,410 tokens worth 4.49lakhs.

Fig 89: Token of Namma metro  
Fig 90: Commuter pass of Namma metro  
Fig 91: Commuter pass of Singapore metro
7th March 2013, DNA reported that BMRC wanted major trains to stop at Byappanahalli. There is a connection given between the IR and MRT at two stations: Byappanahalli and Yeshwantpur. At Yeshwantpur BMRC wanted to connect directly to platform but due to lack of consent from IR the connection is at the entrance as shown in the figures below.

![Byappanahalli Railway Station and Metro Station adjacent to each other](image)

**Fig. 92:** Byappanahalli Railway Station and Metro Station adjacent to each other
On 15\textsuperscript{th} March 2013 DNA reported on the plight of workers and their living condition of the case that was lodged in April 2009 to the labour commissioner by a research student since then the metro officials closed to give any information to outsiders.

During this time the metro construction work was happening at Peenya route and this caused bottle necks which were taken up as issue and there was a clash of opinion with BBMP officials about the inconvenience caused to the residents.

\textbf{Fig 93}: Yeshwantpur Railway Station and metro station facing each other

\textbf{Fig 94 & 95}: Bottle neck at Peenya during construction and dust on road
2013 was a year of promises by Metro. January they started the work on the boulevard and it was completed in April. The Rangoli Metro Art Centre was opened to public. Interactive snake and ladder was a major attraction by kids. Visamaya gallery hosted the display of photographs capturing the journey of metro and Chaya gallery hosted pictures of Bengaluru- A city in Transition. It is making an effort to restore the cultural legacy the place had. They also developed Bengaluru santhe at Vivekananda station.

**Fig 96:** MG Road Boulevard  
**Fig 97:** Interactive snake and Ladder  
**Fig 98 & 99:** Bengaluru Santhe
6th June 2013, TOI reported that 160 flats would be demolished to accommodate the new route of Metro. Residents of Casa Ansar would be affected. By 9th June BM reported a new plan prepared by residents which proposed to knock off the flyover and get the station at the junction of Benargatta Road and BTM layout as shown in the figure. At a later date it was proposed to have a multilevel network housing the road, flyover and metro change routes.

![Image: Realignment proposal at Jayadeva Junction](image)

**Fig 100:** Realignment proposal at Jayadeva Junction

June 24th, 2013, BM reported that few metro stations were provided with paid toilet facilities. July 24th BM reported that Whitefield residents in fear of anticipation of the problem of residents of Benargatta Road the Whitefield residents demanded underground metro network. According to President CIA, Whitefield, “Not only will it spoil the area’s skyline but will also affect trade and commerce”.

BMRC has been having aspirations to achieve utmost comfort travel to all its citizens. And one such move was reported by TOI on 31st July 2013, “Hop off metro and board your flight”. Phase 2 BMRC proposed to expand to BIA.
August 11th, 2013, BM reported the transfer of tough talking N. Sivasailam from MD’s post and Pradeep Singh Kharola replaced him. 12th August reported Hebbal emerging as an Intermodal Transit Hub.

Figure 101: Hebbal emerging as Intermodal transit hub

September 20th, 2013, BM reported that BMRC incurred a loss of Rs. 5 lakh as commuters pocket tokens souvenirs. Hence a new rule was formed of issuing only one token per person and no return tokens were issued. Stolen tokens were found to be on sale at eBay for $6 each.

The year 2013 saw several deaths on site and injuries due to falling beams or other reasons. The month of October also reported woman commuter harassed by lewd youths on metro enroute MG Road to Byappanahalli. This month also saw Time property reporting a push on property rates along metro line. TOI in November reported a fashion show on Metro.
Fig 102: Rise in property prices along the metro rail
Metro church street gate was to open in Jan 2013 but opened in October 2014. December 2013, also reported nuisance by drunken youth at MG Road.

2014 was another year of promises. January 18th 2014, TOI, reported 9 students team of M. Arch. Of Columbia University in collaboration with Shrishti School of Art, Design and Technology came up with a project and transformed drab urban spaces under flyovers to interactive designed spaces. This project was undertaken at Anand Rao circle. Taking a cue from this BMRC must also do the same as BBMP has allocated Rs. 50 crores to do the same with flyovers.

1st March, saw the first Green Line opened to public connecting Rajajinagar and Yeshwanpur stretch. Here too art was incorporated at the stations. John Devraj was the artist selected by the BMRC along with few design schools like Shrishti. Many families had been displaced and the compensation was not in line to the market price but they are happy or so they say to contribute to the growth of the city. Metro is not only a joy ride but also a man of daily commute to and back from work.
5th March reported extension of night life to 1:00am. BMRC and BMTC gave concurrence in plying late provided there would be enough crowds. As of now the services close down at 10:00 pm with skeletal services of BMTC run after that and late commuters are left to the mercy of autos or cab drivers. Though people are not happy with the compensation but once the metro work was taking gain the land price rose by 20-30% and property analysts predict that it would further increase by 10% once the metro has gained momentum by next year.

The two major issues reported by TOI in March 2014 were: safety of women and need for pedestrian pathway. There have been tremendous awareness created and media pressure on government to take action on these issues. Today six to seven months later one can see move towards providing walkway/ footpath and giving importance to pedestrians.

Peenya Metro Green Line had expected to carry more passengers than it sees today but the officials are hopeful that once the further connectivity is given more people would use the metro which on survey and interview was found to be the truth as people said there is too much change and no proper connectivity with other transport. Also Peenya is dusty and is more like Peenya village hence the commuters are hardly seen at that station.

April 29th, TOI reported a disappointment for people who hoped that metro would cut across city which has been postponed to 2015 as of now. May 15th, 2014, TOI, MD, BMRC, Pradeep Singh Kharola stated that Northern line will launch in December 2014. And they hope to open the majestic station by March 2015. Soon after this statement, May also reported that giant boulders are delaying the metro work. These rocks 60’ below the ground are hard to drill through. But one may wonder wouldn’t this tunnelling disturb the natural rock bed and make it susceptible to earthquakes/ movements in the rock bed which would have gone loose due to this drilling through.

June 21st saw September 2015 declared as a new deadline for metro Phase I. BMRC is hopeful it would be done much before but safety clearance and trials might need that cushioning period. July 13th saw metro add another feather to its cap when it played Samaritan to Navrathan Jewellers on MG Road. It supplied the water to douse the fire. All metro stations have a storage of 50,000 litres of water for firefighting thereby it
can support the fire department if the fire is in its vicinity. MG Road has storage of 1 lakh litre of water in its sump. This is what was put to use when the fire brigades ran out of water.

September month also reported an achievement, that Bengaluru metro would have India’s fourth largest underground tunnel. Delhi being the largest 35 kms on Yellow Line. Bengaluru’s is about 13.79kms. And another interesting feature is that even being 60’ underground the cell phone connectivity will not be lost. BMRC has used an advanced split antenna technology to elevate call drops. September also reported another feat, next most important phase of Whitefield. The fastest growing IT hub having over 700 industries including more than 10 industrial estates, IT parks, malls, international schools, hospitals and residential spaces. There are only two major roads leading to it: old airport road to Varthur side and Old Madras road to Whitefield. Many of the industries have shifted/ moved to Mallur Road (Kolar) and many have shrunk to accommodate the metro. To take care and not to disturb the IT sector, before the rail work starts, road widening process has been undertaken. September also reported an aspiration story, that six years on and KIA has yet to get the much promised metro link. The concern is the decision on planning of route is not yet finalised. September also saw Peenya metro station being given a facelift by Shrishti students just as Jagga in partnership with Metro from Gothe Institute are doing up the space and making it interactive below flyovers. But as seen today one can respond as an observer that it is not so important to just do up the space but maintenance is equally important. When we visited the Peenya station the effort of Shrishti students can be appreciated but lack of maintenance has turned art into junk.

There is a huge potential of opening up metro to ad agencies and film makers. But high cost and bureaucratic angles leave the film industry to stay away from metro. However, Delhi metro has made major moves in this direction, the latest being the Levis Commuter ad.
October also reported loss by metro in 2013-14 these could have been major reasons in restoring revenue. However new strategies to improves resources are by renting out the place to commercial purposes and to advertisements. BMRC has been making sensual efforts to make Rangoli Art Centere interactive and happening. They tied up with Bengaluru Story telling Society and Workbench Projects for weekend of entertainement at R-Mac (Rangoli Metro Art Centre).
Meanwhile Kaveri machine has been drilling through the difficult 400m stretch from Victoria Hospital to Chickpet facing a lot many challenges as it had to pass through the congested Chickpet area safeguarding the old commercial/residential buildings.

Observations on MG Road-Bypanahalli as well as on Mantri Malls- Peenya line it showed that there was a good mix of social class travelling in the metro. All genders used the metro and there was a mix of students to elderly either for joy ride or work or shopping used the metro. Metro being with a limited reach has benefitted people on these lines for example people from Indranagar find it easy to commute to MG Road for work or shopping similarly at Mantri mall the shop keepers reported during construction the footfalls had fallen but after construction the footfalls increased however they yet have to see the conversions as it’s just been two months since this line is functional.

Fig 106: Mix of class at MG Road line, the car parked ferried a woman with laptop who took the metro
Fig 107: Mix of class at Peenya line
Observation of streets around metro stations…

**Fig 108:** Mix of class at MG Road

**Fig 109:** Mix of class at Peenya Industry station also one can see the cycle stand
Aesthetics and maintenance were a major concern which can be seen through these images below.

Fig 110: Beautifully designed station but no maintenance

Facilities as promised by BMRC are trying to be in place as shown in the images below.
6.4. Viable solutions- people’s perspective

Now that the issues and concerns have been identified viable solution with people participation may be looked into. Few of the solutions thought of by the author based on peoples responses have been listed here.

6.4.1. Socially inclusive mobility

Few of the solutions that a city can look in as a solution for socially comfortable mobility are to staggered school and office timings. This method has been adopted by many companies in the Electronic city to prevent overcrowding on road. Another solution would be to decentralise the facilities so that not everyone has to travel to MG Road for shopping and provide an access to daily needs by new forms of grocery shops which may be closer to residences or home delivery concepts. The sector planning followed by Steel Plant Townships has been very successful in this regard.
Each sector has its own community centre, post office, bank, shopping arcade and so on, thereby preventing people from one region to travel to the other region unless really required. Senior citizens and disabled must be also taken into consideration and a right to access must be provided to them everywhere. Government could also look at free public transport for senior citizens as all their life they have paid taxes and also by doing so they would be encouraged to reach this system and that many cars will be less on road leading to that much less noise and air pollution. Another solution would be to have a Weekly no driving day on certain roads as in Tokyo. The shopping centre has a no vehicle day on Sundays and it’s a stress free shopping street. A few days ago the newspaper reported that Karnataka government is planning to introduce the same system for MG Road. Another concept would be to encourage people to use public transport for which the public transport must increase its reach and availability. Also the footpaths must become pedestrian friendly so that they can safely travel to the bus stops.

Fig 114: Street closed on Sunday for pedestrians, Toyko, Japan
Fig 115: Times of India, dated 17\textsuperscript{th} Nov, 2014 reported a concept in CBD urban planning similar to most developed nation with pedestrian walkway and space to relax.

6.4.2. Gender equality

At one level when women talk of equality on the other hand they talk of separate ladies compartment in the metro. This is owing to their safety. With crime against women increasing they do feel unsafe after sunset. Survey research has shown that more women are asking for woman’s compartment, so there might be a possibility that many woman do not travel for the same reason. On interview with few women who travelled in general compartment in Delhi metro expressed the same concern. Newspaper has also reported cases of harassment of woman commuters. Today in Bengaluru the workforce of woman is in par with the men hence their safety is a major concern to and from work.
6.4.3. Harmonious culture with tolerance
Bengaluru is a cosmopolitan city with people of different class, cast and religion. Therefore it is important that it maintains the harmony with which it accepted the immigrants and tolerance towards them. This amalgamation is seen in apartment complexes where people of all religions, caste and class join hands together to celebrate festivals, birthdays and marriages.

6.5. Inference:
Metro has been well received by the people of Bengaluru but the project is at a very nascent stage to make any concrete solutions. But the analysis shows a positive feedback that the project will be just as successful as Delhi metro once it is fully functional. Delhi metro is the lifeline of its citizens a day of no metro is a nuisance for metro commuters of Delhi.

6.6. Conclusion:
Bengaluru metro was welcomed as a mixed bag by the citizens. At one hand they were excited to be named as a modern city with modern infrastructure; on the other hand they were upset that metro which was running through the heart of the city skyline was spoiling the beauty of Bengaluru. A major resentment was seen at MG Road, where the city lost its boulevard and greenery and some of the landmark shops were relocated and few old structures pulled down to a new facelift. The famous India Coffee House was relocated from MG Road and today it has lost its clientele in the processes. Lake view restaurant was relocated for a brief period and it returned back to a new ambience on MG Road. MG Road during construction period was a sad sight as the place was dug up for construction. There have been efforts to recreate the old glory through the boulevard and Rangoli Metro Art Centre but a little more effort through interesting lighting solutions could have made the metro station at MG Road come alive at the night. Aesthetics and maintenance are a matter of concern at all metro stations. Apart from this basic facilities are missing at most stations, currently they are only a means of commute and there is no experience value attached to it. The study also revealed that at present the metro does not have any significant impact on the streets of Bengaluru but once functional it would positively make an impact as seen in the case study of Delhi.