PERCEPTION OF URBAN SPACE THROUGH THE EYES OF ELDERLY

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in partial fulfilment of the SPARK Internship Program 2020 Of IIT-Roorkee

1. Elderly Inclusive Neighbourhood

2.Imageability

3.Way Finding and Navigation

4.Spatial Cognition

5. Neighbourhood design of the Post COVID scenario

6. Eye Tracking Technology of Built Environment

Objective: To understand the perception and need for the elderly living in an urban area in India and obtain design ideation for their active aging.

Literature Research

Literature Review

Personas and Scenario

Qualitative User Research

Analysis Of User Research

Design Ideation

‘Kallus et al.,2000
•Neighborhood’ :
•dynamic and evolving concept
•no monolithic or frozen meaning

humanistic approach: 'universal human phenomenon	instrumental approach: Neighbourhood is build	phenomenological approach: neighborhood as a cultural phenomenon

Idea of ‘age-friendly neighborhood’
•In 2006, WHO developed a program to promote an age-friendly environment in cities.
•**Age Friendly city:** *“encourages active aging by optimizing opportunities for health, participation, and security in order to enhance the quality of life as people age”* (Smith et.al, 2013) .

•Urban Spaces: mostly designed for younger people (Handler,2015)
•**age-related communities?**
“the places where older people are actively involved, valued and supported with infrastructure and services that effectively accommodate their needs” (Alley et al., 2007).

Spatial Cognition:
“a branch of cognitive psychology that studies how people acquire and use knowledge about their environment to determine where they are, how to obtain resources, and how to find their way home.” (Waller et al. 2013)
•It determines:
- •number of services used by the elderly individual,
- • the distance of unique trips made by elderly,
- •average length of these unique trips. (Waller et al. 2013)

Eye Tracking: Study of the Built Environment
•popular tool for investigating spatial cognition (Kiefer et al., 2017)
•Enables to know : "where, when, how long, and in which sequence certain information in space or about space is looked at," (Kiefer et al., 2017)
•allows urban planners to design better spatial representations and optimal placement of sign

Imageability is a measure of how easily a physical object, word or environment will evoke a clear mental image in the mind of any person observing it.

Personas and Scenario

Image Source : Jettyimages.com

Created :
•5 personas and
• 5 scenarios

Problems Highlighted:

1. Power cuts and Lifts

2. Unavailability of Public Transportation due to COVID-19

3.Skepical of the quality of online services for milk and vegetables

4. Unavailability of household help/maids in COVID-19

5. Less mingling with the neighbourhood

6.Shifting to a new place and finding hard to adapt.

7. Prohibition to go to public place like parks and place of worships

8. Medical appointments disturbed because of COVID-19

Name: Nelson

Persona and Scenario

Age: 70
Profession - A retired employee of MNC
Place: Uttar Pradesh

Nelson is a retired employee of an MNC, who lives in Sunshine colony, Hyderabad.
Nelson has been living in the same apartment for ten years. Nelson is a divorcee and lives alone. He has two children, Ariel and Naman. Ariel is a married working woman who lives in Chennai while Naman, who is pursuing his Ph.D., lives in Pune. His children rarely visit him. Nelson's apartment is on the 8th floor of his building. Whenever there is a power cut, Nelson is not able to use the elevator of his building and he has to opt for stairs if the work is urgent. Nelson visits the church every Sunday but faces a lot of difficulties when the lift stops working or the electricity cuts off. Earlier, he used to drive his own vehicle, but he was diagnosed with cataract two years back, and so he uses public transport for going to church.
However, because of COVID-19, public transport is not in use in order to contain the virus, and Nelson is left with no choice. He has a market very close to his society, so he often buys essential and groceries in bulk, but going to church and meeting his friends there is restricted, at least until the situation becomes normal.

Sudha Kumari
Age 65, Female
Housewife

•2 sons, both live in foreign country
•Husband has problem walking for long distance

Challenges:
•Cant use public transport to go for shopping because of COVID 19
•Has to carry heavy bags

Goals:
1. Want to use public transport like pre-COVID19 times
2. Want to use online delivery without the fear of catching COVID-19/ Skeptical of the quality too.

Ajay Haldua
Age 71, Retired Principle
•wife passed away in dec 2019: chronic illness
•Living with son Sushant and daughter in law Priya since Jan 2020

Challenges:
•Adapting to a new place after living 40 years in Noida
•Earlier: park for evening and morning walk – cant: COVID-19
•WFH: son and Daughter-in-law more busy (to save their jobs)

•Goals:
Outing and quality time with family

Savitri Singh
Age 57, Female
Housewife

•Lives with her husband
•Rekha, housekeeper do dishes, booming, mopping, dusting in the house
•Love talking to children of fellow flatmates

Challenges:
•Lack of household help in the time of COVID-19
•Feels lonely, since parents don't allow children to go out

Goals:
1. Want help from someone to reduce her workload (ask husband to contribute)
2. Want to meet children of fellow flatmates, as she enjoyed their company (video call)

User Research Methodology

10 sections
total question = 65, Respondents = 58

- Qualitative & Quantitative Research using survey
- Recruitment of the participants
- Participant Information Boucher: https://docs.google.com/document/d/16qPaLD2rsKk_R4wDNoOeRiCwAYKC2KFc/edit
- Form Link : https://forms.gle/LGjkhnufKR899ia76

Confidentiality

Anonimity

Informed Consent

Right to Withdrawal

Types of Questions
- MCQ
- Likert scale
- Short answer type
- long answer type

Section 1 of 11

Perception Of Urban Space

Greetings! As part of Human-Computer Interaction research, Prof Saptrashi Kolay of IIT-Roorkee and Nimisha Karnatak (student of MSc Digital Society at IIIT-B) are studying the perception of space through the eyes of the elderly.

The project aims at the heuristic evaluation of urban space, based on the perception of the elderly population. This research work will conduct the behavioural study using Eye-Tracking technology and will focus on the analysis of spatial cognition and eye fixation data. Our aim is to come up with the design ideation of an inclusive neighborhood for the elderly.

Please read the participant information broucher for more details - https://docs.google.com/document/d/16qPaLD2rsKk_R4wDNoOeRiCwAYKC2KFc/edit

This form has short answer type questions, drop-down questions, and Multiple choice questions.
In the questions where a scale is given from 1 to 5, in those questions 1 = least and 5 = maximum.

Participant Information Brochure

Project Title: Perception Of Space Through The Eyes Of Elderly

Invitation
Greetings! As part of Human-Computer Interaction research, Prof Saptrashi Kolay of IIT-Roorkee and Nimisha Karnatak (student of MSc Digital Society at IIIT-B) are studying the perception of space through the eyes of the elderly.

The project aims at the heuristic evaluation of urban space, based on the perception of the elderly population. This research work will conduct the behavioral study using Eye-Tracking technology and will focus on the analysis of spatial cognition and eye fixation data. Our aim is to come up with the design ideation of an inclusive neighborhood for the elderly.

We invite you to actively participate in the:
Qualitative Research: We will be circulating online questionnaires written on google docs on your preferred medium: WhatsApp, Gmail, or any other medium, based on your preference.

Before you decide to take part, please read this information.

Do I have to take part?
Participation is entirely voluntary. You are able to withdraw your contribution at any stage without giving a reason. If you decide to withdraw it, please let Nimisha Karnatak know at Nimisha.Karnatak@iiitb.org

Activity consent
By taking part in the research you are allowing your responses to be recorded as part of the research project. The response of participants will never be used for profit and we will always ensure that your views and ideas are accurately represented. You can choose to be either anonymous or recognizable throughout your participation.

- **Being anonymous**
  Your identity will be completely anonymous and confidential. No identifying information of the participant will be linked to the research. If we include your responses in papers, articles, and presentations, we will make sure that your identity remains anonymized.

- **Being recognizable**
  You can also choose to be recognizable. In that case, we might use your responses with your real name text in papers, articles, and presentations.

Researcher contact details
Nimisha Karnatak
Summer Research Intern at IIT-Roorkee
Master Of Science in Digital Society at IIIT-
Email :nimisha.karnatak@iiitb.org

Questionnaire Details

10 sections
total question = 65

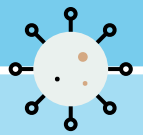
Demographic Details:
Name
•Age
•Gender
•Marital Status
•Current Place
• Type of Building,
•Number of people in house
•City of Origin
• Mother tongue
•Highest level of education
•Profession

Accessibility:
•Public Transportation (availability and level of satisfaction)
•Roads condition (Level of satisfaction, problems, footpath availability)
•Water logging
•Assistive device used, if any
•Lightning and illumination

Safety and Crime:
•Definition of safe neighbourhood
•Ever felt unsafe?
•Stray animals: and provision of neighbourhood
•Older person being attacked by stray animal

Mobility in the neighbourhood:
•How elderly socialise with neighbourhood
•How often they go out
•Nature of visits
•Parks, Libraries, Community Centre, Place of worship
•Daily mode of transportation

Cleanliness and Greeneries:
•Satisfaction with cleanliness of the neighbourhood
•Suggestions to make neighbourhood more green and clean
•Problems regarding the cleanliness
•Allocated garbage dumping areas



•Society Disorder/Social Order :
•Ever felt threatened in neighbourhood
•Neighbours helpful?
•Rate of crime?
•Whom do you call in emergency; how far this person live
•Person with whom you share your thought
•Level of satisfaction with Police law

Way finding and Navigation:
•Roads easy to cross?
•How often help is required to cross road?
•Condition of Traffic Congestion
•Availability of resting space when get tired of walking like benches, sidewalk, near a tree shade, culvert
•Public facilities like : public toilet, schools, small retail shop in neighbourhood?

Medical Facilities:
•How far is the hospital ?
•Mode of transportation to go to hospital
•Medical facilities your nearest hospital have
•Patients referred to other hospitals?
•Hospitals near you have beds and ventilators for COVID-19
•How far is the COVID-19 hospital
•Medical appointment disturbed because of COVID-19

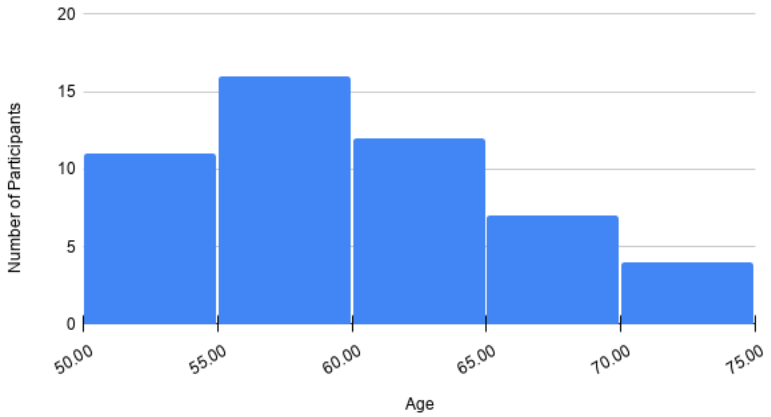
The Air Quality of Urban Space:
•Effect of air quality on health
•Patient or symptoms of any airborne disease

COVID-19 effect :
•Your zone: **R**, **O** , **G**
•Effect on mental, physical, social life, daily schedule.
•Helplessness during COVID-19;Fear of catching COVID-19, close one got infected with COVID
•Community initiative to keep up the spirit during COVID 19
•Lack of household help
•Effect on Public Transportation
•Sanitizer and mask or essential product availability
•Use of home delivery services

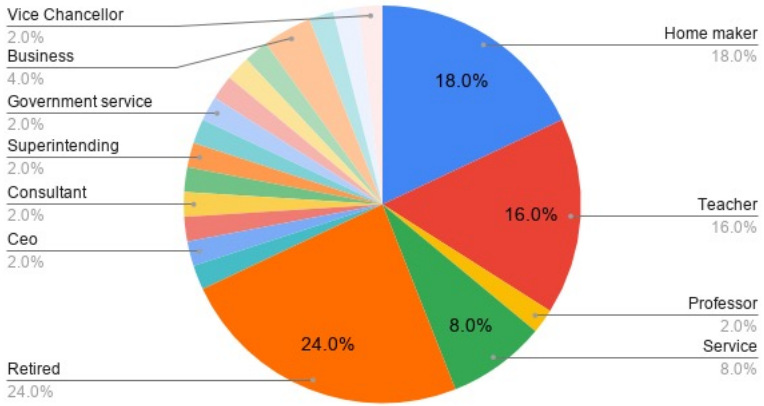
Data Analysis

Demographic Details

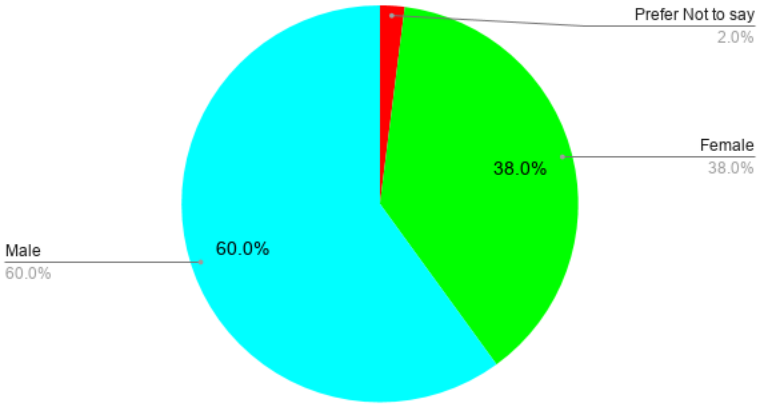
Histogram of Age



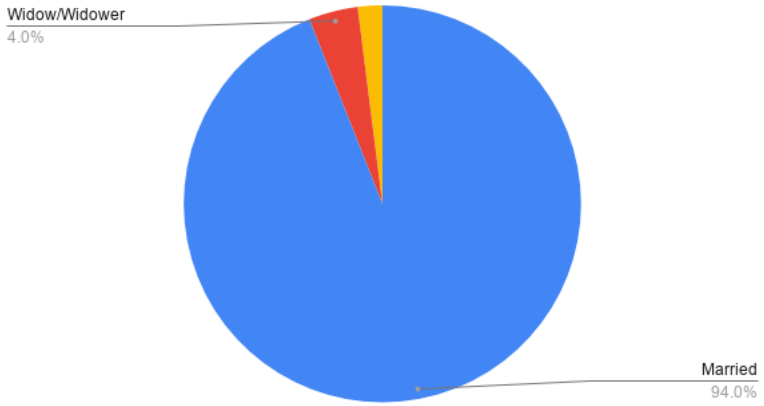
Profession



Gender

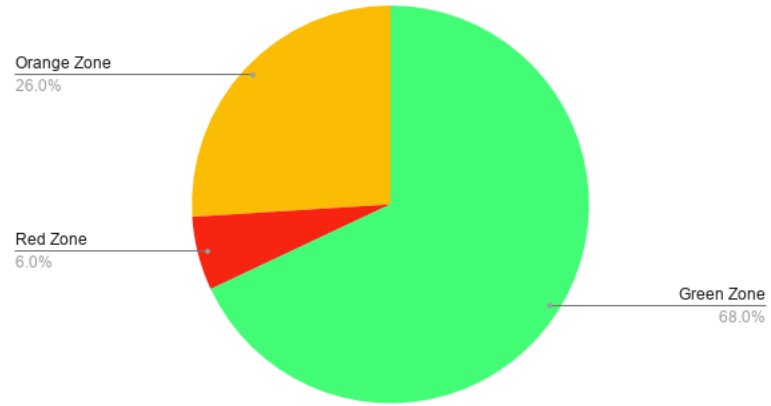


Count of Marital Status

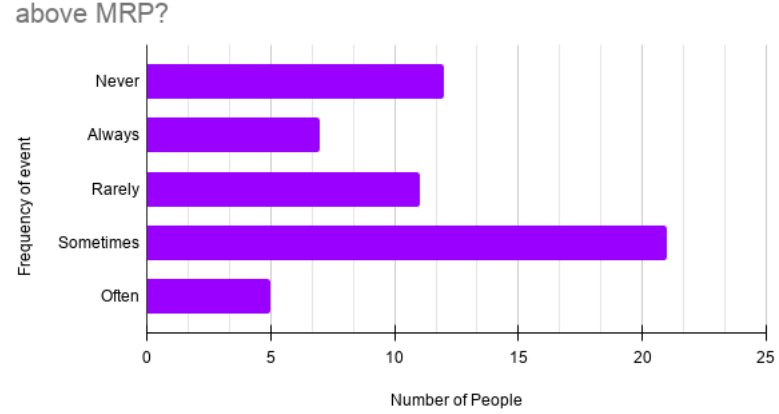


COVID-19 specific

Red/Green/Orange Zone



Sanitizers, masks, or other essential products sold at price above MRP?

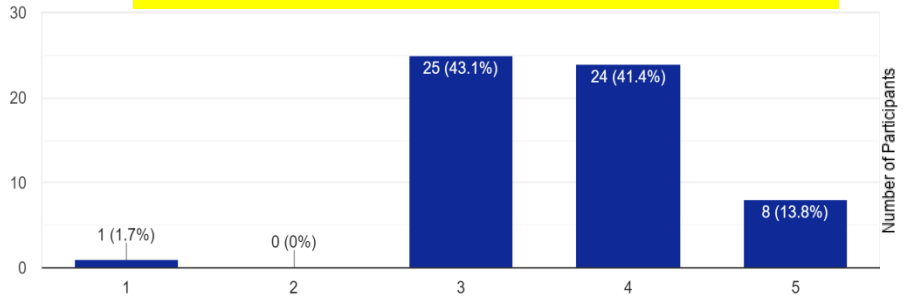


COVID-19 Specific

Are you paying more attention to your mental health after the COVID-19 pandemic?

58 responses

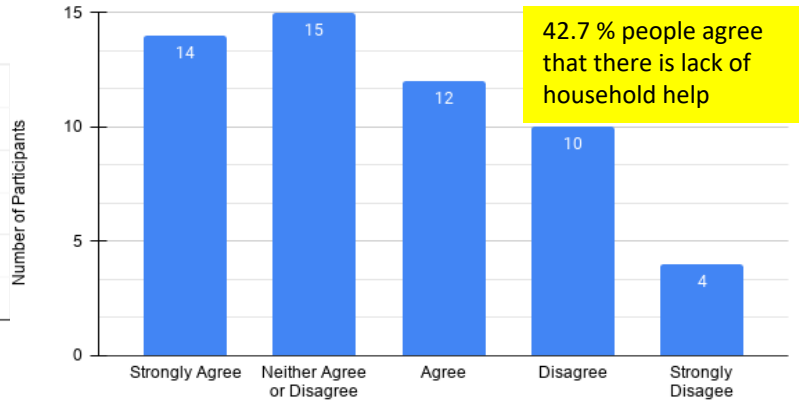
55.2 % people: paying more attention to mental health



1= much less than before, 2= less than before, 3= unchanged/same as before, 4= increased than before , 5= much increased than before

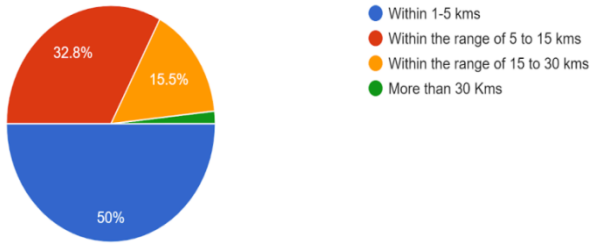
There is a lack of household help during the time of COVID-19.

42.7 % people agree that there is lack of household help



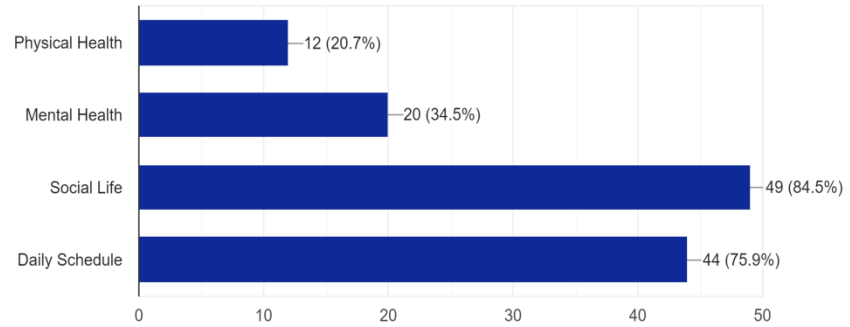
How far you have to go from your place to find a hospital that has facilities for the treatment of COVID-19?

58 responses



How has your life changed after COVID-19?

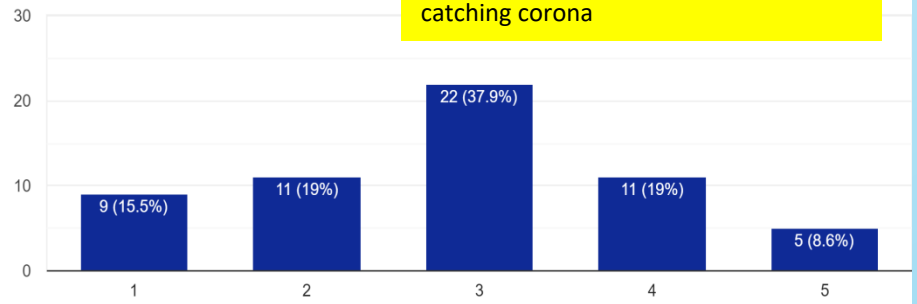
58 responses



Do you fear that you might catch coronavirus too?

58 responses

26.5 % fear often or always about catching corona



1 = Always , 2= Often, 3 =Sometimes, 4= Rarely, 5= Never

Some Important Statistics

Satisfaction with the way potholes are maintained in the neighbourhood

15.5 % : very unsatisfied
32.8 %: unsatisfied
27.6 %: Neutral
19 % : satisfied
5.2 % : very satisfied

47 % are unsatisfied

Satisfaction with the number of benches or sitting space in neighbourhood

17.2 % : Very Unsatisfied
24.1 % :Unsatisfied
17.2 % : Neutral
22.4 % : Satisfied
19.00 % :Very Satisfied

41.3 % are unsatisfied

Patient referred to another hospital because could not be treated in the neighbourhood hospital:

12.1 % Always
19.0 % Often
11.0% Sometimes
24.1 % Rarely
25.9 % Never

31.1 % people said patients are “often or always” referred to other hospital

Is there a foot path in the neighbourhood?

50.9 %: No
49.1 %: Yes

50.9 % : NO

Neighbourhood is well illuminated even during night

13.8 % : Strongly Disagree
24.1 % : Disagree
22.4 % : Neither Agree or Disagree
25.9% : Agree
13.8 % Strongly Agree

37.9 % disagree

Respondent says:

- “No specialist in my hospital”
- “Only first aid is given in my hospital”
- “Our city do not have advance and latest medical facilities. All critical cases related to heart, accidents and major surgery are always referred to higher centers.”

Water logging issue in neighbourhood?

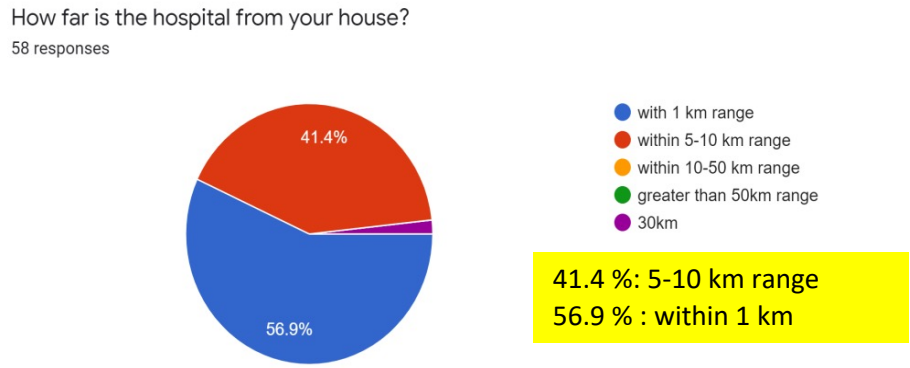
51.7 % Yes
48.3 % No

51.7% :YES

Satisfaction with the condition of footpath

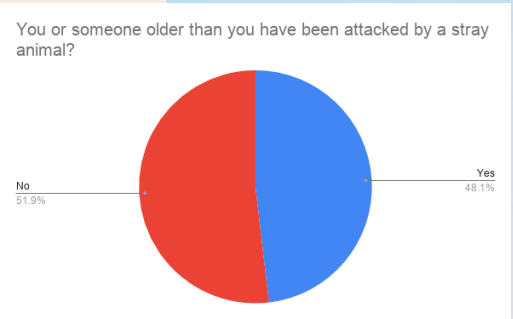
33.90 %: Very Unsatisfied
19.96 % :Unsatisfied
19.96 %:Neutral
21.40 %: Satisfied
5.400 %: Very Satisfied

53.86 % : Unsatisfied



41.4 %: 5-10 km range
56.9 % : within 1 km

Design Ideation

Topic	General	Elder
Changes to make public transport more accessible	•Increased Frequency of public transportation to reduce waiting time (more vehicles too) •Availability at call (Authorities to arrange number) •**Small sized public transport vehicles for interior parts of the city** •More public transport In hilly areas •Clean, well-maintained and pocket friendly •On-Time Bus	•**Last mile connectivity.** •**Ramp is required In buses/train/metros** •**Availability of E-rickshaw in the society for older people to go out of gate** **Respondent says** "More e-rickshaws should be available as it's a society in which I live so it takes good 5-10mins to reach to the main gate of the society. " •Priority for elders in public transportation •**Low foot stand, to enable easy entry in public transportation**
Roads	•Timely Maintenance of roads and potholes A respondent says: There is no maintenance of road since last 15 years •Maintenance of road prior to rainy season	•Construction and maintenance of footpaths •Increase in number of sitting spaces like benches in neighbourhood •Well- illuminated especially during night •Proper signage (spatial cognition)
Safe Neighbourhood	•Well Lit •Security Guard and frequent police patrolling especially at night •CCTV Surveillance and Burglary Alarm •Proper verification of vehicle before entering the premise •Adherence to traffic rules •Electricity 24*7 •Restriction on Illegal vendor and non-verified tenants •Timely availability of ambulance •Free from interference of wild animal •Well maintained road to avoid accident •Timely availability of ambulance	**A respondent says:** "Monkeys are the main problem in this area. They damage kitchen garden and attack on human beings.We do not have any protection from them. Street dogs and nonmilching cows or male calfs damage kitchen garden some times" **Another respondent says**: Plenty of stray dogs which are scary for morning and evening walkers 51.9 % : No **48.1 %: Yes** 

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THANK YOU ☺