

■ square
yards



SUITABILITY INDEX

THE COVID PERSPECTIVE

| MUMBAI
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| BENGALURU



June 2021

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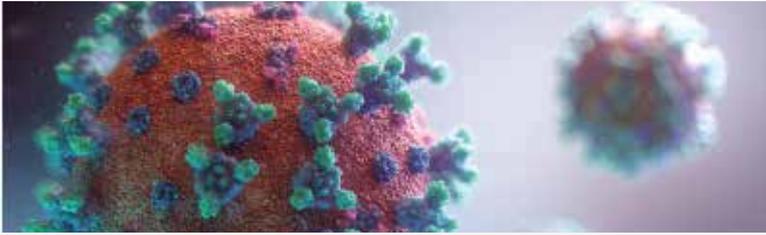
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EXECUTIVE SUMMARY

Post the 2008 crisis in real estate, 2020 was the first time that real estate was witnessing a situation that the sector was not prepared to handle. In fact, COVID-19 is a calamity so unprecedented that no business or industry in the world were prepared to tackle it. As far as the real estate sector is concerned, almost all business activity and construction work were stalled leading to a complete halt in sales.

However, the sector recuperated faster than anyone expected. Historically low home loan, multiple offers and payment schemes by developers and slashed stamp duty rates meant that October 2020 onwards, residential sales picked up pace delivering one of the largest number of property registrations in cities like Pune and Mumbai.

Having said that, what needs to be understood is that the end user showed an urge to buy homes for many reasons other than just the financial benefits. It was not just that people were "stuck" in their homes during COVID-19 and suddenly decided to upgrade to a bigger one. It was something deeper: Homes became our "safe" haven during a scary and uncertain time. Quarantine was the greatest accidental PR campaign that made people realize the value of real estate. Home ownership took an all-new meaning and importance in everyone's life.

Apart from offering a safe abode, one's own home also became one's new workplace. The discovery of the home being the new office was fascinating to many, especially in IT/ITeS and many other related fields where the output was not affected at all.

Thus, the need for one's own 'home' has gained an all-new dimension since 2020 due to the changes brought in by the pandemic. And these changes are here to stay. This study is an attempt at making the home-buying process in the COVID era slightly more pragmatic. It highlights certain meaningful factors that today's end users need to acknowledge while deciding to buy the right home in a pandemic like situation.

We believe that considering factors such as population density, open area ratio and hospital infrastructure could be of far more importance than distance from work or affordability to decide where you live under the current scenario. The report uses these factors and the COVID status in three top cities: Mumbai, Bengaluru and Gurugram, to ascertain the suitability of these cities on the basis of livability which in turn would help an end-user make an informed decision on where to live.

We hope you will find the report meaningful and worth considering before you upgrade or switch homes.

Key highlights

- As per the analysis, **Gurugram** was the most suitable city to live from a COVID perspective amongst the three cities studied for the report.
- The **East zone** in Gurugram, the **Western and Central suburbs** in Mumbai (wards N and PN) and **Mahadevapura** zone in Bengaluru were found to be the most suitable to live from a COVID perspective.
- The pandemic exposed the shortcomings in our medical infrastructure like never before. Both Mumbai and Bengaluru were poorly placed in this regard with just **1.3 and 0.30** COVID hospitals available respectively per 10,000 people in the cities. Gurugram outshone both with **2.5** hospitals per 10,000 people.
- Contrary to the common notion, the report suggests that Mumbai has the highest Open Area ratio amongst the three cities at nearly **45%**.
- Mumbai was the most densely populated with nearly **60,000** people/Sq.Km while Gurugram had the lowest population density at approximately **4200** people/Sq.Km.



INTRODUCTION & METHODOLOGY

Overview

This report aims to study the **Suitability Index with respect to COVID** for the population currently residing in three prime cities of India namely Bengaluru, Mumbai and Gurugram. Not only are these cities the top real estate destinations in the country but also were one of the top cities to be severely hit by COVID. This is where the relevance of a Suitability Index kicks in. The aim of this study is to understand and highlight the suitability of a place to live or work under the current COVID scenario based on meaningful parameters.

Four prime parameters were considered for computing the **Suitability Index: Population Density, Covid Infected Cases, Hospital Infrastructure and the Open Areas Ratio** of each locality or zones in the selected cities.

Methodology

To assess this, a *Weighted Sum* technique was used to evaluate how a particular area is more suitable or less suitable for the living or working population there. It is done by overlaying the different parameters as layers in GIS technology to create a thematic map for a better understanding.

The *weighted sum technique* provides the ability to weigh and combine multiple inputs to create an integrated result. With multiple inputs, representing multiple factors, it can be easily combined to incorporate weights or relative importance.

Weighted Sum works by multiplying the designated values for each input data by the specified weight. It then sums (adds) all input data together to get the result.

Data Layer	Weightage(%)
Population Density	25
Covid Cases	25
Hospital Infrastructure	25
Open Areas	25

For the analysis, ward wise population was considered for Mumbai and zone wise population for Gurugram and Bengaluru, which is how the covid cases are being reported in these municipal jurisdictions.

To calculate the population density (per Sq.Km.) of these cities, the population as per census 2011 along was considered.

The cumulative number of covid cases reported by the city officials was taken into consideration for calculating the covid density of these areas.

The total number of hospitals in an area for covid treatment was considered for the calculation of hospitals available per 10, 000 people.

Also, the extent of open area per square kilometers (land open to the sky as per the development plans of each city) was calculated and used in the overall suitability index calculation of these cities.

SUITABILITY INDEX

THE COVID PERSPECTIVE

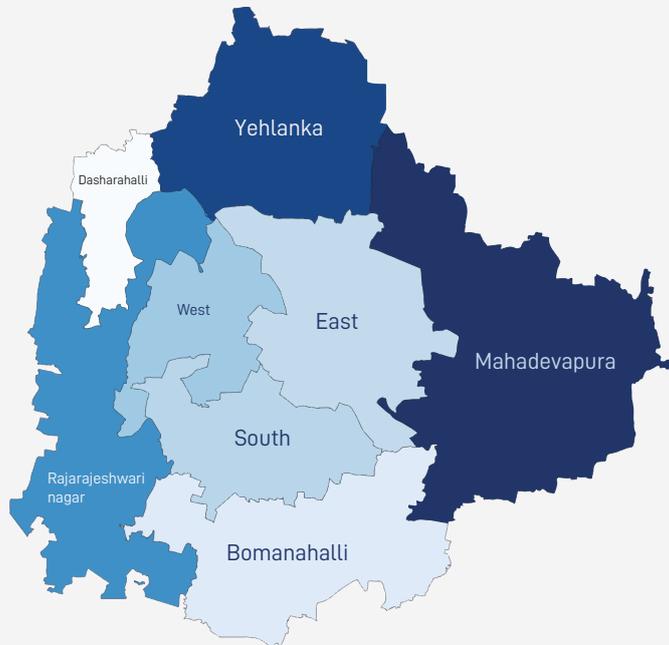
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June 2021

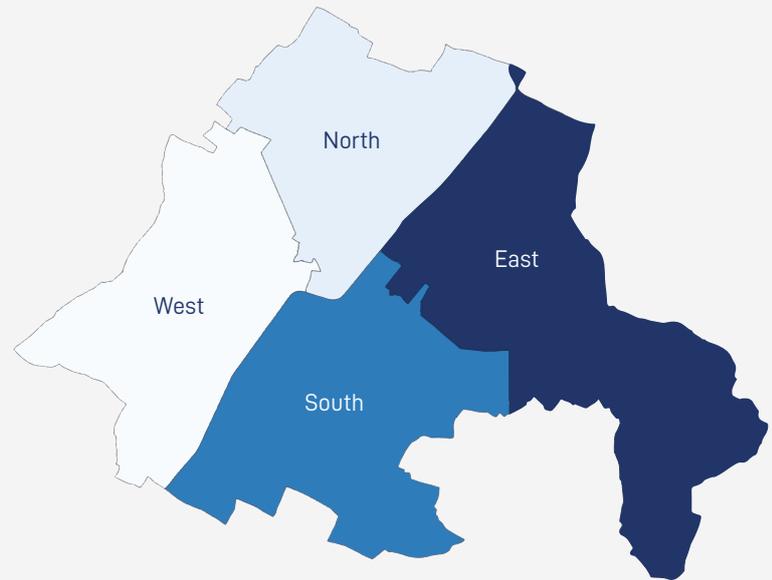
MACRO ANALYSIS:

BENGALURU VS MUMBAI VS GURUGRAM

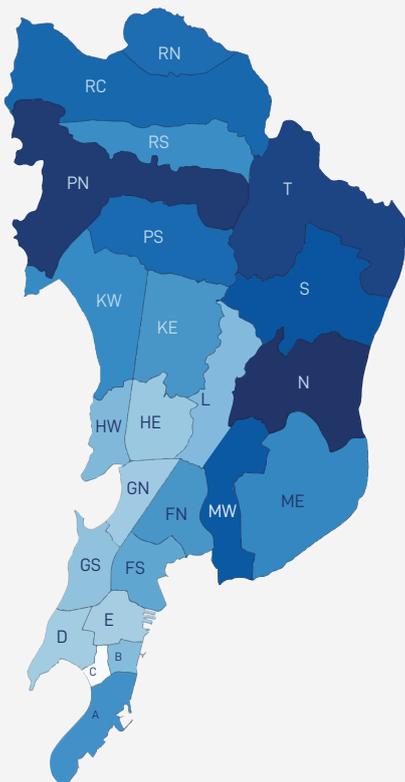
Suitability Index Bengaluru



Suitability Index Gurugram



Suitability Index Mumbai



- In Bengaluru and Mumbai the suitability index of different zones was largely influenced by two parameters namely the population density and the number of COVID cases.
- As per this analysis, Mahadevapura, was the most suitable zone in Bengaluru. Some of the localities in the zone were Bellandur, Devasandra and Marathahalli.
- In Mumbai, localities in the N and PN wards, which largely form the Western Suburbs and the Central Suburbs were found to be most suitable.
- Suitability in Gurugram, on the other hand, was defined more by the population density, open area ratio and the number of hospitals.
- As per this, localities in the East zone such as sectors 52-56, 58, 40-44, 30, 24-27 etc were found to be the most suitable for living as per the index.
- Even though the density of COVID cases in this zone was second only to the North, presence of maximum number of hospitals/10K people, more than 40% open area and lowest population density makes this zone the most suitable and hence livable from the COVID perspective.

Population

- As per the population data, the average population density in Mumbai is nearly 60,000 people/Sq.Km. and touches 70,000 in some wards. It is followed by Bengaluru and Gurugram with an average density of 15, 000/Sq.Km. and 4200/Sq.Km. respectively.
- Nearly 80% of the population in Gurugram seems to be concentrated in the West and North zones.
- Mumbai being an island city, is undoubtedly a tightly lived city and was obviously the worst affected in the pandemic.

Open Area

- Data clearly suggests that the newer parts of the cities that were developed probably after the 1990s clearly had more Open Area ratios due to implementation of a proper development plan.
- Mumbai leads with an average of 45% open area per Sq.Km. followed by Gurugram at an average of 35% followed by Bengaluru at a mere 20%. Now, without this validation-anybody would think Mumbai does not have Open Area.
- The open area analogy can be drawn with real estate prices too which are seeing higher appreciation in the newly developed areas of the city as compared to the older and established parts.

Hospital Infrastructure

- The last two years have been an eye-opener to the fact that the healthcare infrastructure even in our top cities is not well equipped to handle a pandemic like Covid-19. As per our data, both Mumbai and Bengaluru offer only 1.3 and 0.30 hospitals per 10,000 people respectively, while Gurugram outshines both the cities with 2.5 hospitals for every 10, 000 people.

Covid Cases

- Mumbai had 13 of the total 24 wards severely affected with more than 50 cases per 10,000 people. In Gurugram, the North and East zones averaged 55 cases per Sq.Km. while in Bengaluru 4 zones of the total 8 zones recorded more than 200 cases per Sq.Km

SUITABILITY AT A GLANCE: THE COVID PERSPECTIVE

City Name	Population/Congestion	Open Area	Hospital Infrastructure	Covid Cases	Overall Ranking
Gurugram	1	2	1	1	1
Mumbai	3	1	2	2	2
Bengaluru	2	3	3	3	3

**For all parameters, the common logic of ranking persists wherein 1 is the most suitable and 3 the least. However, in case of Covid cases 1 refers to the city with the least no. of covid cases (making it the most suitable) and 3 refers to the city with the maximum cases (making it the least suitable).*

CITY ANALYSIS: BENGALURU

The rules used to calculate suitability is based on Population Density, Open Area, Hospital/10K Population and Covid Density.

Population Density

Lower the population density higher the suitability rate and vice versa.

Open Area

Higher the open area higher the suitability rate and vice versa.

Hospital/10K Population

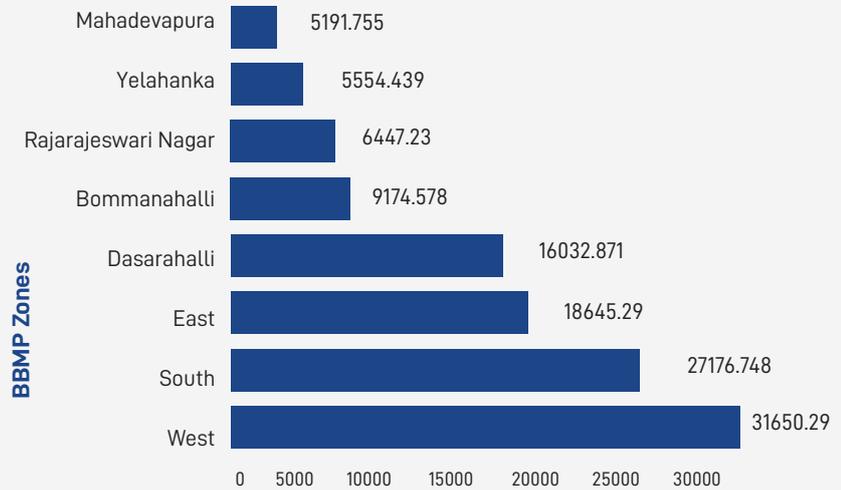
Higher the hospital value/10k population higher the suitability rate and vice versa.

Covid Density

Lower the density higher the suitability rate and vice versa.

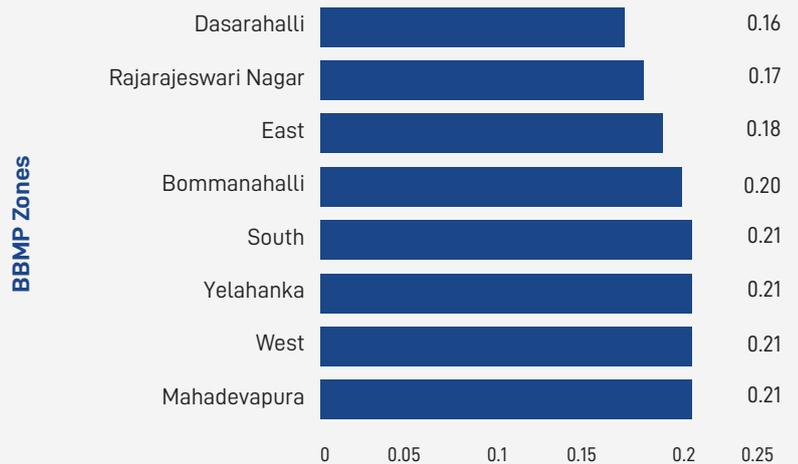
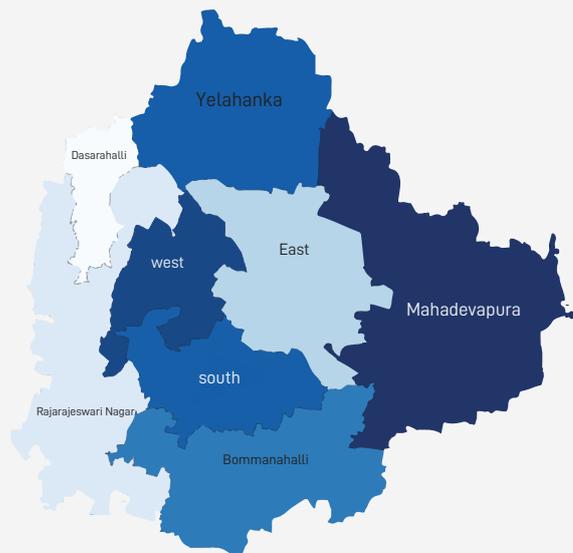
*All the calculation is done as per census 2011. Covid cases are considered for the last 10 days as on 20th May 2021 and Open area is calculated as per BDA Revised Master Plan 2031.

Population Density (Per SQ.KM.)



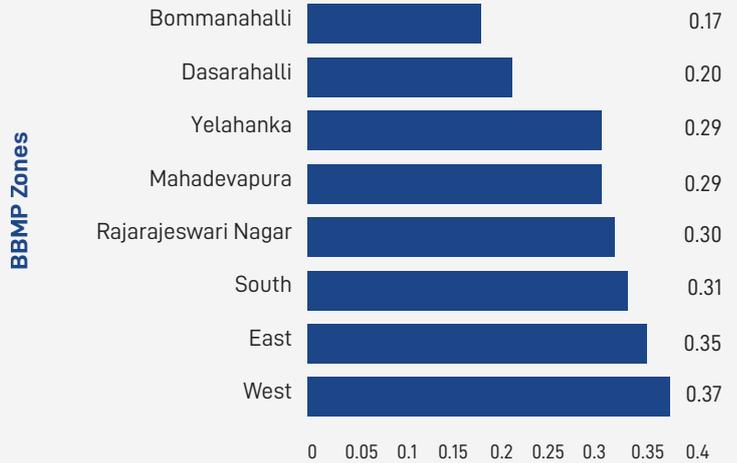
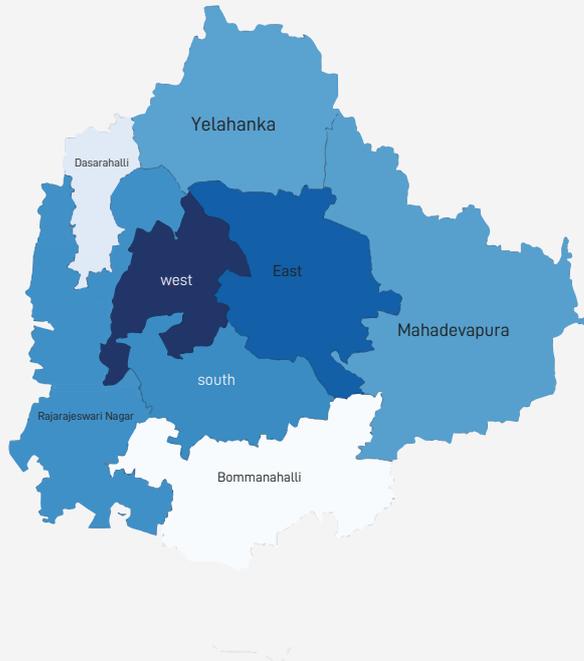
The West is the most densely populated zone per Sq.Km. whereas Mahadevapura is least densely populated zone in Bengaluru. The East, West and South zones being the focal and oldest parts of the city make up for almost 65% of the overall population in Bengaluru.

Open Area (Per SQ.KM.)



Data shows that all zones in Bengaluru offer almost the same level of Open Area (between 0.16 to 0.21) per Sq.Km. This establishes the fact that the planning of each zone was done keeping in mind the liveability quotient. And clearly this planning is one of the key reasons why Bengaluru continues to grow faster than traditional metro cities such as Chennai.

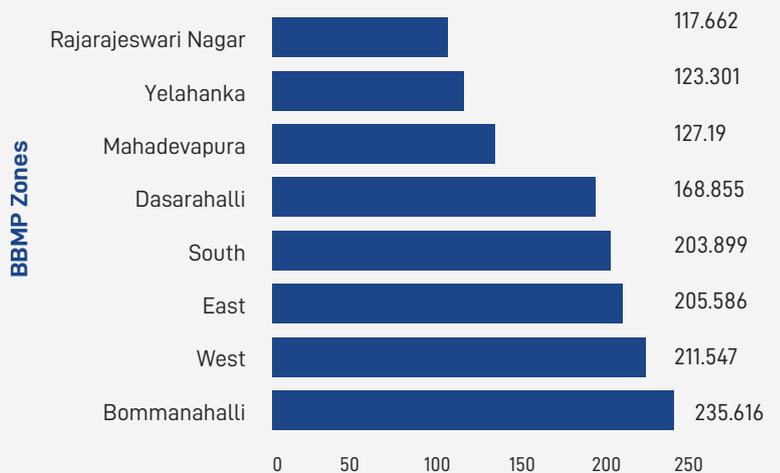
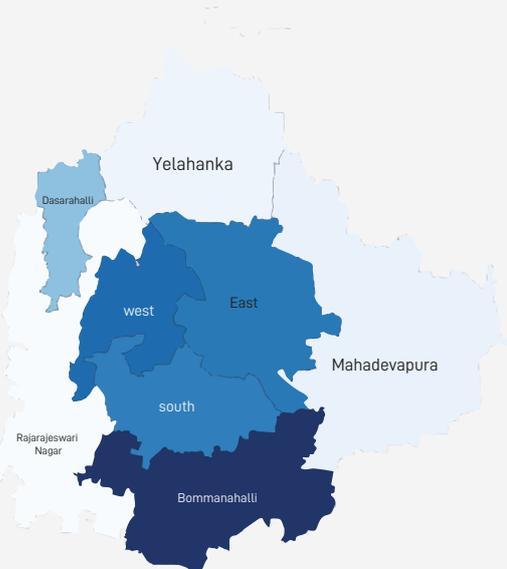
Hospitals /10K Population



Unlike Mumbai and Gurugram, Bengaluru has a well distributed network of medical facilities. Except Darasahalli and Bommanahalli, which form the outer extremes of the city, all other zones have almost equivalent number of hospitals available per 10, 000 population.

LOW HIGH

Covid Density (Per SQ.KM.)



Data shows that Bommanahalli has the highest covid density in Bengaluru with 235 cases/ Sq.Km. whereas Rajarajeswari Nagar has the lowest covid density with 117 cases/Sq.Km. Data further suggests clearly that the spread of the virus looks uniform across all zones.

LOW HIGH

CITY ANALYSIS: MUMBAI

The rules used to calculate suitability is based on Population Density, Open Area, No of People per Hospital and Covid Cases per 1000.

Population Density

Population Density – Lower the population density higher the suitability rate and vice versa.

Open Area

Open Area – Higher the open area higher the suitability rate and vice versa.

Hospital/10K Population

Higher the hospital value/10k population higher the suitability rate and vice versa.

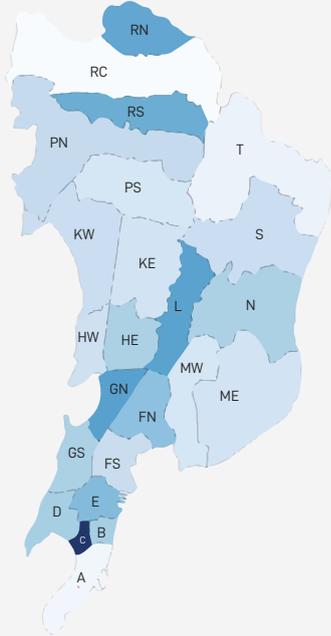
Covid Cases (Per 1000)

Lower the cases per 1000 person higher the suitability rate and vice versa.

*All the calculation is done as per census 2011. Covid cases are considered till 10th May 2021 and Open area is calculated as per DP 2034.

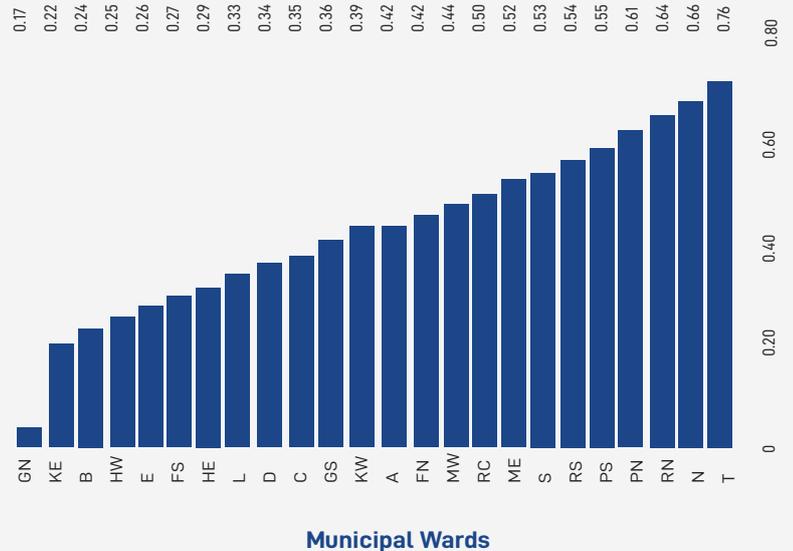
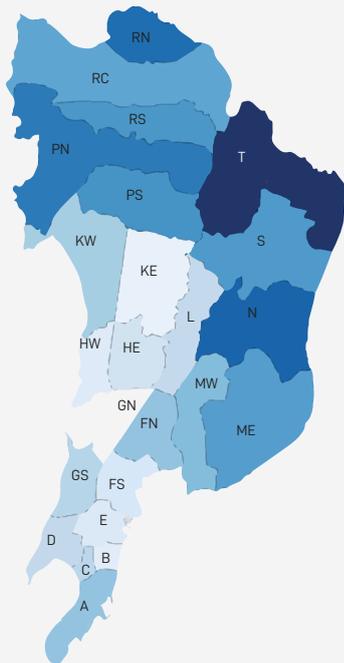
**Population density is only calculated for urban areas of municipal wards. All the non-urban areas such as natural areas, water bodies, no development zone, etc. are discarded from the calculation.

Population Density (Per SQ.KM.)



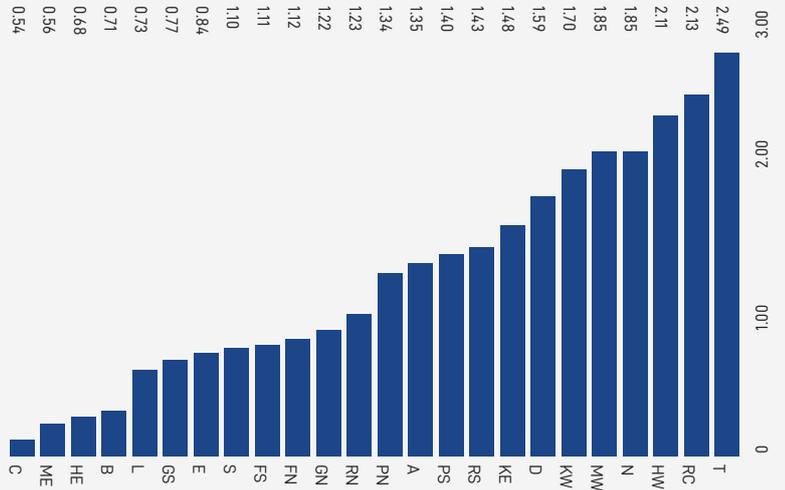
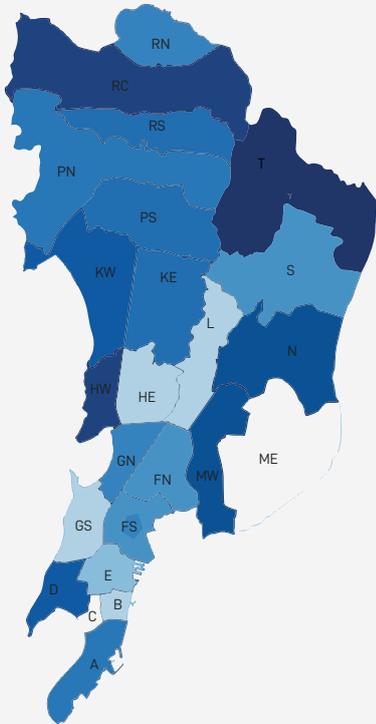
In Mumbai, ward C lying towards south of the city comprising of localities such as Kalbadevi, had the highest population density at more 1,00,000 people/ Sq.Km. On the other hand, ward RC which largely encapsulates localities such as Gorai and Borivali West and the neighbouring areas, had the lowest population density/Sq.Km.

Open Area (Per SQ.KM.)



Data shows that there is a huge variation in the extent of open area available per Sq.Km.(ranging from .17-.76) in different zones in Mumbai. By and larger localities in the Western and Central suburbs offered the highest open area/Sq.Km. with ward T topping the chart.

Hospitals/10K Population



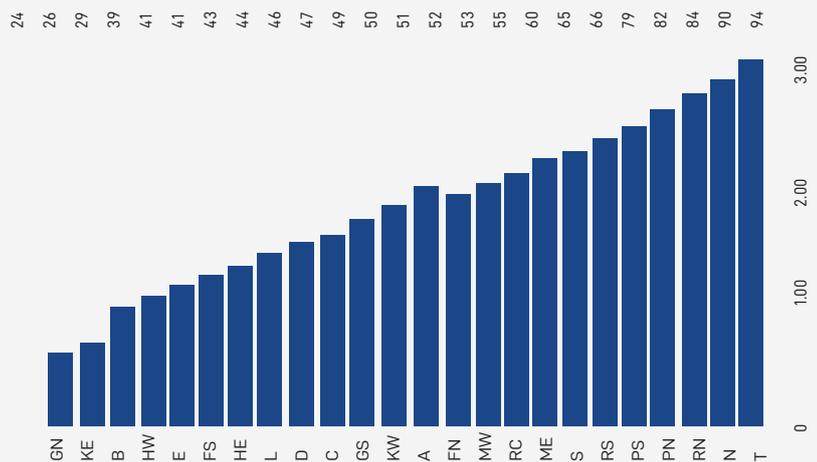
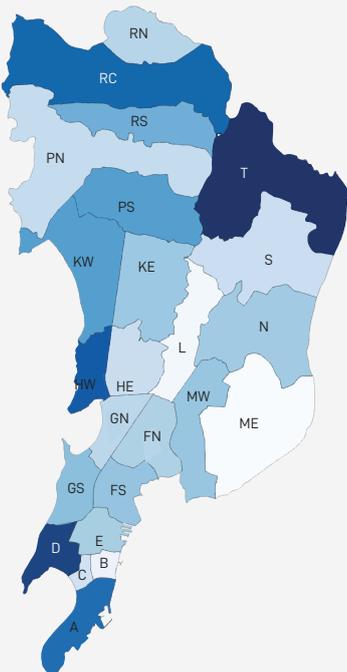
Municipal Wards

Data shows that unlike Bengaluru, the hospital network in Mumbai is very unevenly spread. While the wards T, RC and HW have more than 2 hospitals/10, 000 individuals, wards such as C, ME and HE lag behind considerably in this regard.

LOW

HIGH

Covid Cases (Per 1000) People



Municipal Wards

Data revealed that wards T, D, HW and RC were the most severely it with more than 80 cases of COVID recorded for every 10, 000 people in the city. These included localities such as Mulund East and West, Borivalli East and West, Bandra West, Santacruz etc. The heat map indicated that the spread of the virus was more severe along the peripheral wards as compared to the central zones.

LOW

HIGH

CITY ANALYSIS: GURUGRAM

The rules used to calculate suitability is based on Population Density, Open Area, Hospital/10K Population and Covid Density.

Population Density

Population Density – Lower the population density higher the suitability rate and vice versa.

Open Area

Open Area – Higher the open area higher the suitability rate and vice versa.

Hospital/10K Population

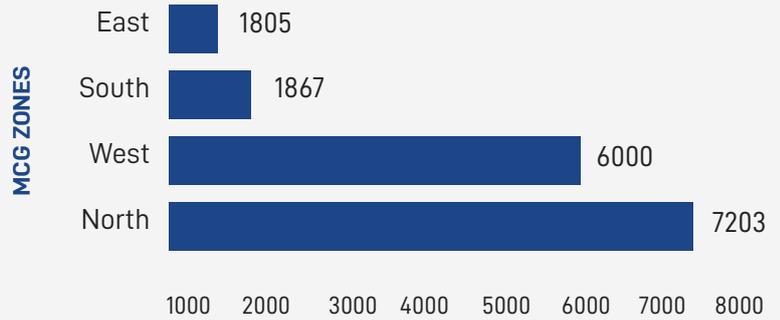
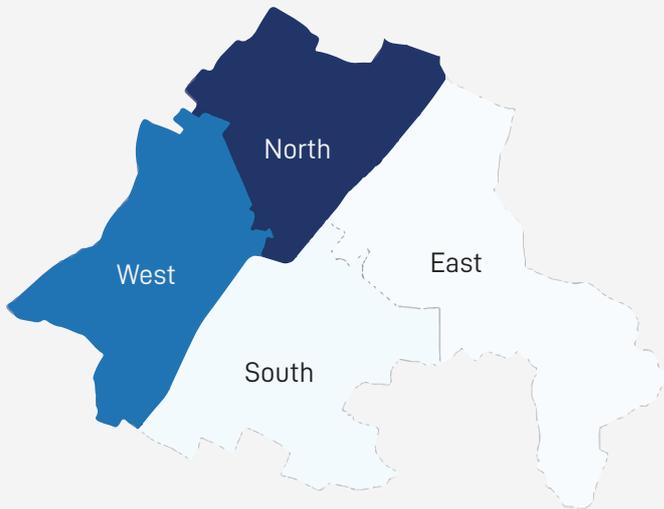
Higher the hospital value/10k population higher the suitability rate and vice versa.

Covid Density

Lower the density higher the suitability rate and vice versa.

* All the calculation is done as per census 2011. Cumulative Covid cases are considered at PHC Level dated 20th May 2021 and Open area is calculated as per Gurugram Master Plan 2031

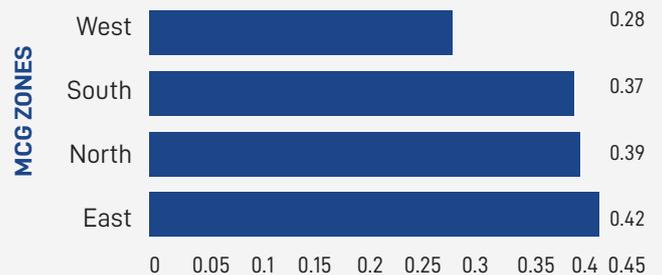
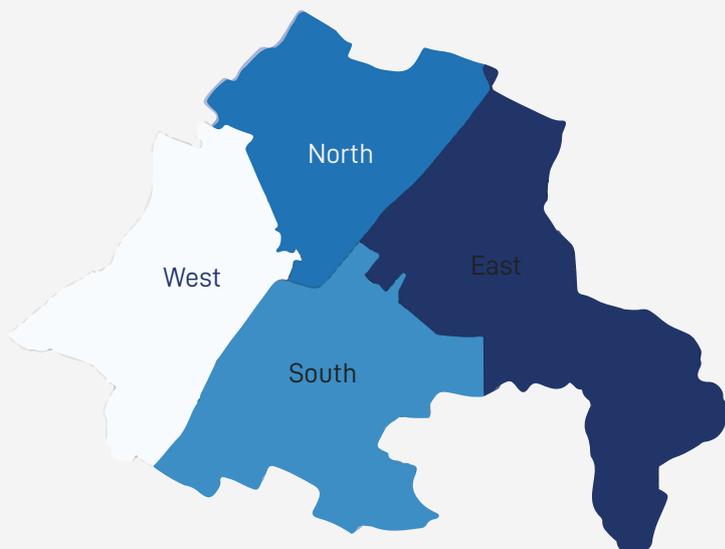
Population Density (Per SQ.KM.)



In Gurugram, the North zone has the highest population density while the East zone has the lowest population density. This could be attributed to the fact that multiple sectors in the zone are dominated by commercial developments and the residential areas largely have builder floors or cooperative societies that have fewer residential units in a given area than multi-storey projects.



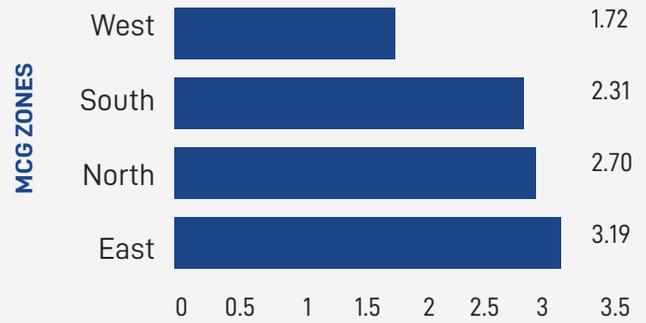
Open Area (Per SQ.KM.)



Data shows that except the West zone, all other zones in Gurugram have more or less similar level of open area (ranging from .37-.42)/ Sq.Km. The open area available per Sq.Km. in the West zone which comprises of developing sectors such as 82, 83, 84, 95, 99, 101 is less than 30%.



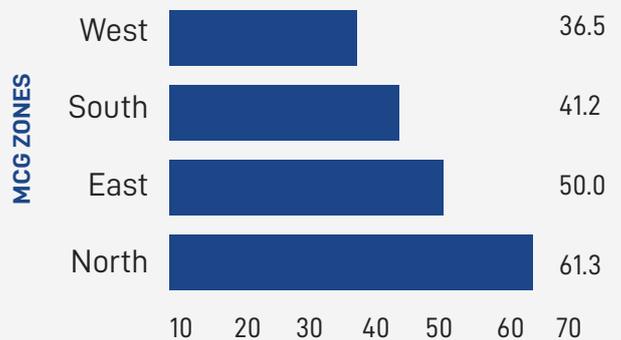
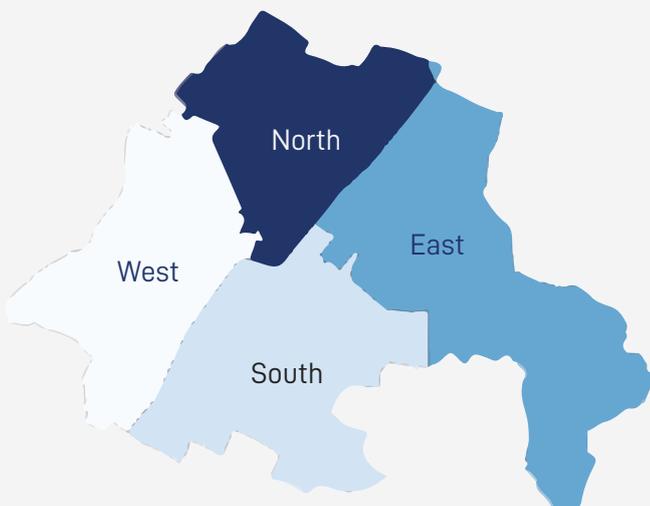
Hospitals/10K Population



Localities in the East and the North zones have the highest number of COVID hospitals/10, 000 population. On the other hand, the West zone that comprises of several developing sectors such as 82, 83, 84, 95, 99 etc. has the least number of covid hospitals/10, 000 individuals.



Covid Density (Per SQ.KM.)



As per the data, with 61 cases/Sq.Km., North Gurugram has the highest COVID density in the city. On the other hand, the West zone has the lowest COVID density with 36 cases/Sq.Km. It was visible from the data that the spread was more rampant in the East and North zones.



Annexure

Bengaluru	
Zone	Localities
Bommanahalli	Anjanapura, Arakere, Begur, Bilekhal, Bommanahalli, Gottigere, Honga Sandra, HSR Layout, Jaraganahalli, Konankunte, Mangamma Palya, Puttenahalli, Singa Sandra, Uttarahalli, Vasanthpura, Yelchenahalli
Dasarahalli	T Dasarahalli, Rajagopal Nagar, Hegganahalli, Peenya Industrial Area, Chokkasandra, Shettihalli, Bagalakunte, Mallasandra
East	Sampangiram Nagar, Shivaji Nagar, Vasanth Nagar, Shantala Nagar, Halsoor, Bharathi Nagar, Jaya Mahal, Pulakeshi Nagar, Sarvagna Nagar, Hoysala Nagar, Jogupalya, Maruthi Seva Nagar, Lingarajapura, Sagayara Puram, SK Garden, Ramaswamy Palya, Devara Jeevanahalli, Muneshwara Nagar, Kushal Nagar, Kadugondanahalli, Kaval Bairasandra, Nagavara, Jayachamarajendra Nagar, Manorayana Palya, Hebbala, Vishwanath Nagenahalli, Ganga Nagar, Sanjayanagar, Radhakrishna Temple Ward, Gangenahalli, HBR Layout, Kacharkanahalli, Kammanahalli, Banaswadi, Benniganahalli, C.V. Raman Nagar, New Tippa Sandra, Jeevanbhima Nagar, Shanthi Nagar, Nilasandra, Vannar Pet, Agaram, Domlur, Konena Agrahara
Mahadevapura	Horamavu, Vijnanapura, A Narayanapura, Ramamurthy Nagar, KR Puram, Basavanapura, Hudi, Devasandra, Garudachar Palya, Kadugodi, Vijnana Nagar, HAL Airport, Hagadur, Marathahalli, Dodda Nekkundi, Varthur, Bellanduru
Rajarajeswari Nagar	J P Park, Yeshwanthpura, Lakshmi Devi Nagar, HMT Ward, Jalahalli, Laggere, Kottegepalya, Jnana Bharathi Ward, Dodda Bidarakallu, Hemmigeppura, Raja Rajeshwari Nagar, Herohalli, Ullalu, Kengeri
South	Dharmaraya Swamy Temple, Sudham Nagar, Vijayanagar, Kempapura Agrahara, Hosahalli, Attiguppe, Hampi Nagar, Bapuji Nagar, Gali Anjenaya Temple Ward, Deepanjali Nagar, Giri Nagar, Sri Nagar, Katriguppe, Hanumanth Nagar, Sunkenahalli, Vishveshwara Puram, Siddapura, Vidya Peeta Ward, Basavanagudi, Ganesh Mandir Ward, Yediyur, Jayanagar, Byra Sandra,

Bengaluru	
Zone	Localities
	Kari Sandra, Pattabhi Ram Nagar, Shakambari Narar, Banashankari Temple Ward, Padmanabha Nagar, Kumara Swamy Layout, Jayanagar East, Gurappana Palya, Hombegowda Nagar, Lakkasandra, Suddagunte Palya, Madivala, BTM Layout, JP Nagar, Sarakki, Chikkala Sandra, Hosakerehalli, Adugodi, Koramangala, Jakka Sandra, Ejipura
West	Chickpete, Gandhi Nagar, Subhash Nagar, Gayithri Nagar, Dayananda Nagar, Okalipuram, Prakash Nagar, Cottonpete, KR Market, Malleshwaram, Aramane Nagara, Raj Mahal Guttahalli, Dattatreya Temple Ward, Kadumalleshwara, Subramanya Nagar, Marappana Palya, Sri Rama Mandir Ward, Binni Pete, Shiva Nagar, Dr. Raj Kumar Ward, Rajaji Nagar, Nagapura, Mahalakshimpuram, Nandini Layout, Mattikere, Shankar Matt, Shakthi Ganapathi Nagar, Vrisahbhavathi Nagar, Kamakshipalya, Basaveshwara Nagar, Agrahara Dasarahalli, Govindaraja Nagar, Marenahalli, Kaveripura, Mudalapalya, Maruthi Mandir Ward, Nagarabhavi, Padarayanapura, Rayapuram, Chelavadi Palya, Jagajivanaram Nagar, Azad Nagar, Nayandahalli, Chamraja Pet
Yelahanka	Kodigehalli, Dodda Bommasandra, Kuvempu Nagar, Atturu, Chowdeshwari Ward, Kempegowda Ward, Yelahanka Satellite Town, Vidyaranyapura, Jakkuru, Byatarayanapura, Thanisandra

Mumbai	
Zone	Localities
A	Colaba, Cuffe Parade, Nariman Point, Churchgate, Fort

Zone	Localities
B	Mandvi, Umerkhadi, Mazgaon, Masjid Bunder
C	Bhuleshwar, Marine Lines, Kalbadevi, Kumbharwada
D	Grant Road, Gamdevi, Malabar Hill, Cumbala Hill, Giragaon, Tardeo
E	Madanpura, Kamathipura, Nagpada, Agripada, Byculla, Chinchpokli, Jacob Circle, Mumbai Central
F/N	Antop Hill, Matunga East, Sion
F/S	Sewri, Parel, Dadar East, Wadala
G/N	Dadar West, Matunga West, Mahim, Dharavi
G/S	Lower Parel, Prabhadevi, Mahalaxmi, Worli
H/E	Bandra East, Khar East, Santacruz East
H/W	Pali Hill, Bandra West, Khar West, Khar Dhanda, Santacruz West
K/E	Vile Parle East, Andheri East, Jogeshwari East
K/W	Juhu, Vile Parle West, Andheri West, Jogeshwari West

Zone	Localities
L	Kurla East, Sakinaka, Kurla West, Asalfa
M/E	Anushakti Nagar, Govandi East, Trombay, Mankhurd, Govandi West
M/W	Bhakti Park, Chembur
N	Vikhroli East, Ghatkopar West, Ghatkopar East
P/N	Madh, Malad West, Manori, Malad East
P/S	Goregaon West, Goregaon East
R/C	Gorai, Borivalli West, Borivali East
R/N	Dahisar West, Dahisar East
R/S	Kandivali West, Kandivali East
S	Bhandup West, Kanjurmarg East, Bhandup East, Powai, Vikhroli West, Dumping Ground,
T	Mulund East, Mulund West, Sanjay Gandhi National Park

Gurugram	
Zone	Localities
East	Sector-24, Sector-52, Sector-45, Sector-44, Sector-29, Sector-41, Sector-30, Sector-56, Sector-55, Sector-54, Sector-53, Sector-52A, Sector-28, Sector-43, Sector-42, Sector-25, Sector-26, Sector-27, Sector-26A, Sector-58, Sector-25A, Sector-40
North	Sector-111, Sector-5, Sector-110A, Sector-110, Sector-106, Sector-12A, Sector-3, Sector-1, Sector-2, Sector-6, Sector-15-II, Sector-14, Sector-13, Sector-16, Sector-17, Sector-12, Sector-11A, Sector-15-I, Sector-18, Sector-19, Sector-23A, Sector-20, Sector-21, Sector-23, Sector-22, Palam Vihar Extension, Ammunition Depot, Ashok Vihar
South	Sector-33, Sector-38, Sector-46, Sector-47, Sector-49, Sector-50, Sector-39, Sector-57, Sector-51, Sector-31, Sector-32, Sector-67, Sector-34, Sector-72A, Sector-35, Sector-69, Sector-70, Sector-76, Sector-75A, Sector-71, Sector-48, Sector-72, Sector-73, Sector-68, Sector-74, Sector-75
West	Sector-4, Sector-9A, Sector-3A, Sector-10, Sector-37C, Sector-10A, Sector-84, Sector-83, Sector-89A, Sector-89B, Sector-100, Sector-101, Sector-104, Sector-105, Sector-9B, Sector-11, Sector-7, Sector-9, Sector-36, Sector-36A, Sector-37B, Sector-36B, Sector-37, Sector-37A, Sector-88A, Sector-88B, Sector-37D

About Us

Square Yards

Square Yards is India's largest tech-led brokerage and mortgage marketplace; a unique Online to Offline (O2O) B2C transaction and aggregator platform for both Real Estate and Mortgages. Over the last couple of years, Square Yards has successfully expanded globally in Middle East, Australia and Canada with current presence across 9 countries and 30+ cities. Backed by partnerships with more than 500+ developers across the globe, Square Yards now helps transact 20,000+ transactions worth USD 1 Bn+ every year in Indian and Global Real Estate & Mortgages, which makes us one of the largest players in the ecosystem.

Zone{Matrix}

Zone{Matrix} is a subsidiary of Square Yards and offering Data Intelligence services. It is a GIS-enabled platform to get credible, insightful data on 'Property Rights' and 'Property Transactions'. The platform integrates multiple data points related to land and building including ownership, reservation, land use zoning, transactions, ready reckoner, mean sea levels, road width, open area ratio, neighbourhood social amenities, building permission in a city to build high level transparency or cursory diligence for pre or post transaction event (sale, lease, mortgage).

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