

CFTE Centre for Finance,
Technology and
Entrepreneurship

Real Estate in The Metaverse

Analysis of Land Prices in
The Sandbox

January 2022

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Centre for Finance, Technology and Entrepreneurship

CFTE

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Preface



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20 years ago, Second Life started as a virtual world and quickly attracted 1 million users who created a virtual economy of \$500m. Virtual worlds are therefore not new, but the rebranding of Facebook into Meta by Mark Zuckerberg in October 2021 put an intense focus on virtual worlds and the Metaverse.

From Metaverse to Web3, from Cryptocurrencies to NFTs, new concepts and applications for our digital future have emerged during the last few years, and have polarised the views between those who praise a decentralised Internet vs. those who think there is no utility, or that this is a bubble disconnected from real life.

Whatever one's views, there is no doubt that digital assets have witnessed a fast adoption, with hundreds of millions holding cryptocurrency wallets and more than \$20bn of Non Fungible Tokens transacted in 2021. Consumer behaviour is therefore slowly changing and the idea of living part of one's life in a virtual world seems closer to reality than science fiction now.

This document has therefore been written to help our community understand how some of these behaviours are changing through the example of the Sandbox, one of the major virtual worlds.

We are still early in the Metaverse, and there is a long way to go before virtual worlds become mainstream. But in the same way as AOL and Netscape helped pave the way for the Internet, some of today's initiatives are laying the foundations for tomorrow's digital world and it is therefore useful for those interested in our digital future to understand how quickly today's behaviours are changing.

These are important trends that are relevant to not only individuals but also organisations, governments, regulators and universities and our hope is that this document can be used as a catalyst to provoke thinking.

We would like to thank the CFTE team for the research and analysis of the Sandbox.

Happy reading!

Disclaimer

In line with CFTE's objectives, this document has been written to provide information useful to the industry and our community.

The content of this document is therefore for informational purposes only, and you should not construe any such information or other material as legal, tax, investment, financial, or other advice.

As of 2022, the world of NFTs and digital assets is still the Wild West in many ways, where fortunes can be made overnight, but risks are plenty and dubious behaviours / scams also abound. Be warned!

As an education platform that focuses both on theory and practice, CFTE also owns and experiments with NFTs and digital assets, and this document is based on our own experience.

Executive Summary

The Sandbox is the largest virtual world in terms of transaction volumes, with 65,000 transactions in virtual land totalling \$350 million in 2021. This is 3 times the amounts on Decentraland, the second largest one (21,000 transactions and \$110 million).

It is a virtual land composed of 166,464 parcels of 96x96m, representing a virtual world of 40km x 40km, where participants can play games and participate in virtual experiences.

Despite being a virtual world, by design the Sandbox shares many features of the real world

- Physical constraints such as gravity
- Scarcity of land
- Scarcity of assets

Because of the choice to limit the amount of lands and assets, prices are mainly determined by supply and demand in the secondary market, and have grown considerably from an average of \$100 per land in January 2021 to \$15,000 in December 2021, with a clear acceleration in Q4 2021 - when the Sandbox Alpha was released .

Although prices are high, the utility of real estate in the Sandbox is not clear yet at this stage, since consumer adoption of the Sandbox is still early, and land benefits are still hypothetical.

Therefore, most transactions are either long-term investments (with the prospective that Sandbox will become a dominant Metaverse) or speculation (with rapid buying and selling of land). Very few are made to effectively use the land, either to create virtual buildings, games or other experiences.

The transactions between November 2021 and January 2022 show the following results:

- 8,000 lands traded per month
- Average transaction price of 3.5 Ethereum (ETH), equivalent to \$13,000
- Single lands traded as high as 60 ETH (\$200,000)

Overall, this virtual real estate market represents \$100m per month, which by any metrics is a high number but should also be taken within the wider context of monthly NFT transactions now exceeding \$2bn.

Whether this trend continues or stops is anyone's guess - after all there are more macro factors at play - but the change in consumer behaviours and the increased familiarity with digital assets has clearly started, and the next few years will likely see these developments continue at an accelerated pace.

Part 1

Introduction

Real Estate in The Metaverse



Background

The Metaverses

The word “Metaverse” was coined by Neal Stephenson in his 1992 novel “Snow Crash”, that also popularised the word “Avatar”. In this virtual world, Hiro, the main protagonist, lives, socialises and shops in the form of his Avatar, and is one of the lucky ones to own real estate in the Metaverse...

That such a book was written 30 years ago and still feels so modern explains its popularity in the Silicon Valley, from Sergey Brin to Jeff Bezos, and has heavily influenced the vision of how a Metaverse should look like.

With the rise of Blockchain, Cryptocurrencies and NFTs during the last few years, a new technology infrastructure gave entrepreneurs and crypto enthusiasts the tools to build a new type of economy - decentralised, with no trusted third party - for the digital world.

Although we are still far from seeing the reality of the Metaverse(s), more and more initiatives are going in that direction, starting with virtual worlds in gaming.

Virtual Worlds and Gaming

The tech giants such as Facebook, Google or Microsoft are aggressively investing in the Metaverse, but there is no guarantee yet that their efforts will be successful - a Zoom meeting between avatars can certainly be fun, but there are certainly more disruptive applications to come.

However, there is a world where virtual reality is already a reality, and that is gaming. From Minecraft to PUBG Mobile to Call of Duty, **3 billion people** worldwide are gamers, which represents an industry of more than **\$300bn**.

The starting point for the Metaverse might therefore not be Skype or Zoom, but the digital world of gaming already familiar to a large part of the population, which is why metaverse interests have focused on gaming worlds such as the Sandbox, Decentraland or Axie Infinity.

With regards to metaverse developments, the Sandbox and Decentraland take the approach of replicating the real world, with avatars moving around in a virtual world. On the other hand, Axie Infinity is more of a game focused on collectibles aimed at breeding and nurturing in-game creatures (similar to the Pokemons). It is likely that many other approaches are still to come.

NFTs

Non-Fungible Tokens and their ability to uniquely identify digital assets have greatly contributed to the growth of transactions in digital worlds such as The Sandbox. In addition, the rise of NFT marketplaces such as Opensea or Rarible have helped to create more liquidity for virtual lands.

Part 2

The Sandbox

Real Estate in The Metaverse



What is Sandbox

The Sandbox is a community-driven, user-developed platform that allows creators and players to profit from digital goods and gaming experiences in a decentralized, blockchain-based environment. Viking Fjord, Mushroom Mania, Sweet Village, and other games on the platform are very similar in concept and structure to games such as Mojang Studios' Minecraft. On the Sandbox, the Blockchain is used to create NFTs, which allow ownership and transactions of digital assets, with scarcity being an important concept at the centre of the game. Participants can own **"lands"**, a piece of property that can be used to build gaming experiences or rented out. They can also own **"assets"** such as **"entities"** (i.e. a character or animal), **"equipment"** (sword or weapon), **"wearables"** (clothing) or even **"art"** (statue or painting). All these digital assets are represented and transacted in the form of NFT.

The currency of the Sandbox (i.e. utility token / cryptocurrency) is called SAND and allows users to buy "lands" and "assets. For example, land is regularly offered on the primary market at a constant price of 1,000 SAND, which, based on the very high volatility of the token, could be \$1,000 as well as \$5,000. SAND is traded on the major exchanges such as Binance, Coinbase or Uniswap.

As a utility token, SAND is not only used to buy land or assets, but also as a means of payment for in-game actions, as well as other useful functions (which could be said to be the key to the world's success): access to paid games, platform governance, non-fungible token transfers, competition organization. It is worth noting that the network also provides access keys, SAND, and non-fungible tokens to users on a periodic basis. It might be viewed as remuneration for both participation and the seasonality with which the game can be played ("alpha seasons").

Sandbox, like other metaverse applications, prioritizes community in its user experience. Sandbox runs an active Discord channel, as well as bigger traditional social media channels, to connect and interact with people and promote continuous contact and participation. From a technical standpoint, Sandbox is a Unity-based gaming engine that runs on desktop computers. Sandbox is also planning to introduce a mobile platform/development in the future.

At this stage, Sandbox is still a very young platform in terms of consumer adoption, with the first gaming season (Sandbox Alpha) released in November 2021 to around 10,000 early adopters to try 18 different experiences.

Sandbox History

On May 15, 2012, The Sandbox was released as a mobile game for the first time. This mobile game was produced by Pixowl, a gaming studio. It allowed players to create their own worlds and take part in challenges. It was first available on mobile before being adapted to PC in 2015. In 2018, Sandbox was purchased by Animoca Brands, a HK-based gaming and venture company. Following the acquisition, Animoca Brands began development of the current version of the Sandbox and leveraged on Ethereum to provide a virtual environment where players can create, own, and sell their gaming experiences. The Sandbox intended to introduce blockchain into mainstream gaming, enticing both crypto and non-crypto gamers with the benefits of ownership, digital scarcity, monetization capabilities, and cross-game interoperability.

The Sandbox has been laying the groundwork for players and creators to buy and exchange NFTs and digital assets during the last few years, and their vision helped quickly attract interest from well-known investors. In 2019, they raised \$2m from a group of investors, including True Global Ventures. In 2020, they raised an additional \$2m. In November 2021, Sandbox raised \$93m, in a round led by Softbank. Although valuation of these rounds are not public, this is a very fast growth in funding by any measures, and also helped push SAND to a record high of \$8 in December 2021 (i.e. a market cap of \$7bn).

During the last 2 years, Sandbox has attracted very strong interest from large brands and famous individuals, such as Snoop Dogg, the Smurfs, Atari, South China Morning Post or the Winklevoss twins, who bought real estate to develop experiences and try new ways to market their brands. General awareness and interest in the Sandbox is therefore very high.

Despite this impressive early interest, the Sandbox is still at an early stage in its development, with the Alpha Session only released in November 2021, and 500,000 accounts created on the platform.

Part 3

Digital Assets

Real Estate in The Metaverse



Use and benefits of lands

Landowners can create buildings and gaming experiences on their lands - very similarly to the real world. Once a participant owns lands, she is free to build any kind of gaming experiences and make it available to other gamers. For example, she can create a free game, or decide to charge players. She can create billboards for advertising or design a museum to display her NFTs. The first benefit of owning land is therefore to have a space to create digital experiences. For landowners who want to build such experiences, location is important, since players will wander around on the Sandbox and will be attracted to more central or well-known places.

Similarly to the real life, landowners can also rent out their lands for others to design their own games, host events and other social activities.

Those benefits are very similar to those of real estate in the physical world, and this is because of the design of the game that mimics the real world. For example, land scarcity is a feature of the physical world, but not a constraint of a virtual game, but was implemented in the Sandbox. The concept of “owner” and “renter” is also very familiar to all of us, but could have been totally different in a virtual economy,

Because of this analogy to real real estate, many participants also invest and speculate in lands for long-term investments and short-term profits, with the view that land will be more valuable in the future. With that objective in mind, being in a “premium neighborhood” or close to landmark locations should influence the value of land, and this is indeed the results found in the analysis.

Purchasing Land

As for the purchase of “lands” itself, it could be acquired from Sandbox’s own platform or one of the secondary external marketplaces such as OpenSea (the largest one for NFTs) or Rarible.

Primary sales happen on the Sandbox on a regular basis. Although it used to be a viable option to buy directly on the primary market, this is now not realistic for most people. The primary sale of January 2022 (Mega City) offered 61 lands (at a price of around 1,000 SAND / \$5,000) and 95 premium lands (4,500 SAND / \$22,000). All lands were sold in less than two seconds.

As of January 2022, the secondary market is therefore the main option for most buyers. Most transactions would occur on Opensea and be denominated in Ethereum (ETH). Although it is simply the case of having a cryptocurrency wallet and executing the transaction on Opensea, this is in some ways both simpler and more complex than buying a real property. It is simpler because one could buy a land worth tens of thousands or hundreds of thousands of dollars in one click. More complex because in a decentralised world, there is no trusted third party such as a solicitor who would guarantee the provenance of the land or whether it is legitimate. Scams / hacks are quite frequent in NFT world, both from malwares on computers to artificially increasing / lowering prices with fake transactions.

This is of course not specific to the Sandbox, but the wider NFT world in general, but it is worth keeping in mind. Although transactions in NFT have increased considerably in 2021, it is still a very young and immature market - unlike more traditional financial markets. It is a market which is at the same time totally transparent - in the history of transactions thanks to the Blockchain - and totally obscure - in the identity of the participants thanks to the absence of trusted third party.

Despite these challenges, the amount of land purchases in the Sandbox has significantly increased in 2021 and there are enough data to have a good understanding of this newly created virtual world.

Landowners

It is worth dedicating some attention to notable entities buying digital lands. The majority of brands within that category tend to primarily originate from the media, gaming or marketing industries. As exceptions and an indication of a possibility for an emerging trend could be Adidas and PwC, active players within their prospective industries.

There was an array of unconventional, yet huge crypto-native corporations (such as Binance or Dapper Labs) which should be distinguished as a separate category. In addition to corporates' own initiatives, the platform seems to have partnered with entities such as South China Morning Post, The Walking Dead or Atari.

The most famous landowner of the Sandbox is perhaps Snoop Dogg, who bought land to create the Snoopverse, with the objective of creating a whole experience around its digital presence. This created a lot of noise, and some fans even bought land for \$450,000 to be close to the Snoop mansion.

Part 4

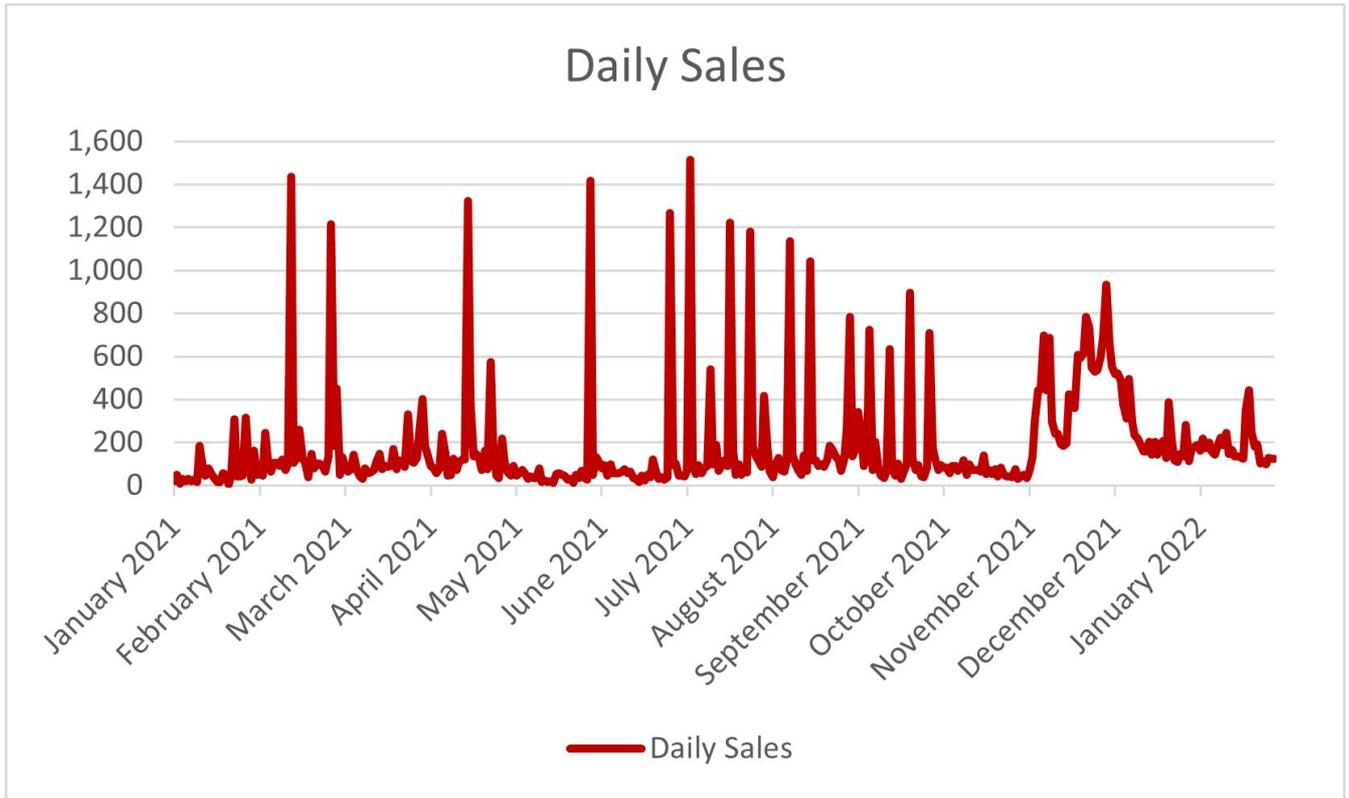
Price Analysis

Real Estate in The Metaverse



Volumes

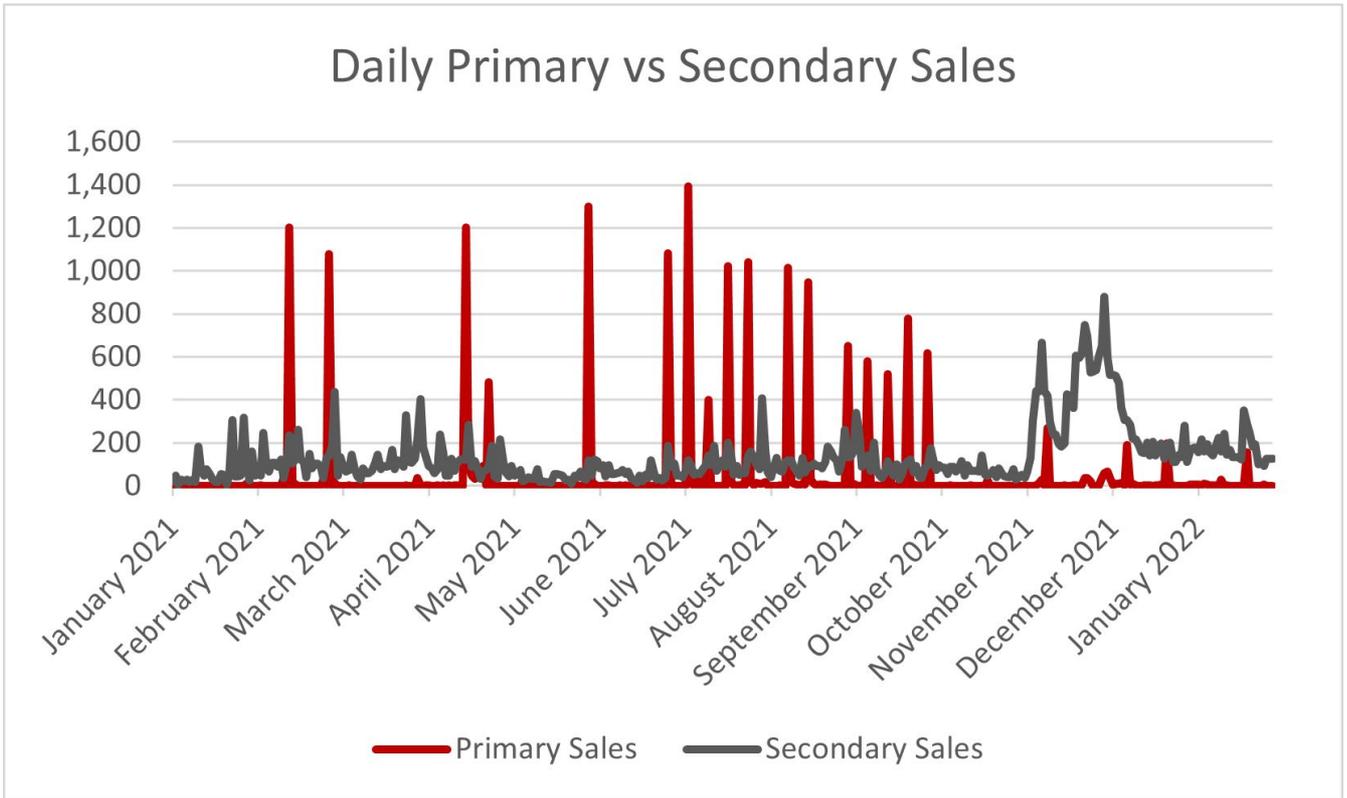
Figure 2



Since 1st January 2021, there has been an **average of 180 land transactions per day**. The minimum is 6 per day, and the maximum is 1,513.

At first sight, there is a very large volatility in the number of transactions - with random peaks followed by low transactions - but this can be explained by the difference between primary and secondary sales, as seen on the next page.

Figure 3



Splitting the transactions between primary and secondary market shows that the peaks come from the primary market, which makes sense: from time to time, the Sandbox offers lands on the primary market, and those are bought over a very short period of time. (it used to be days, it's now seconds).

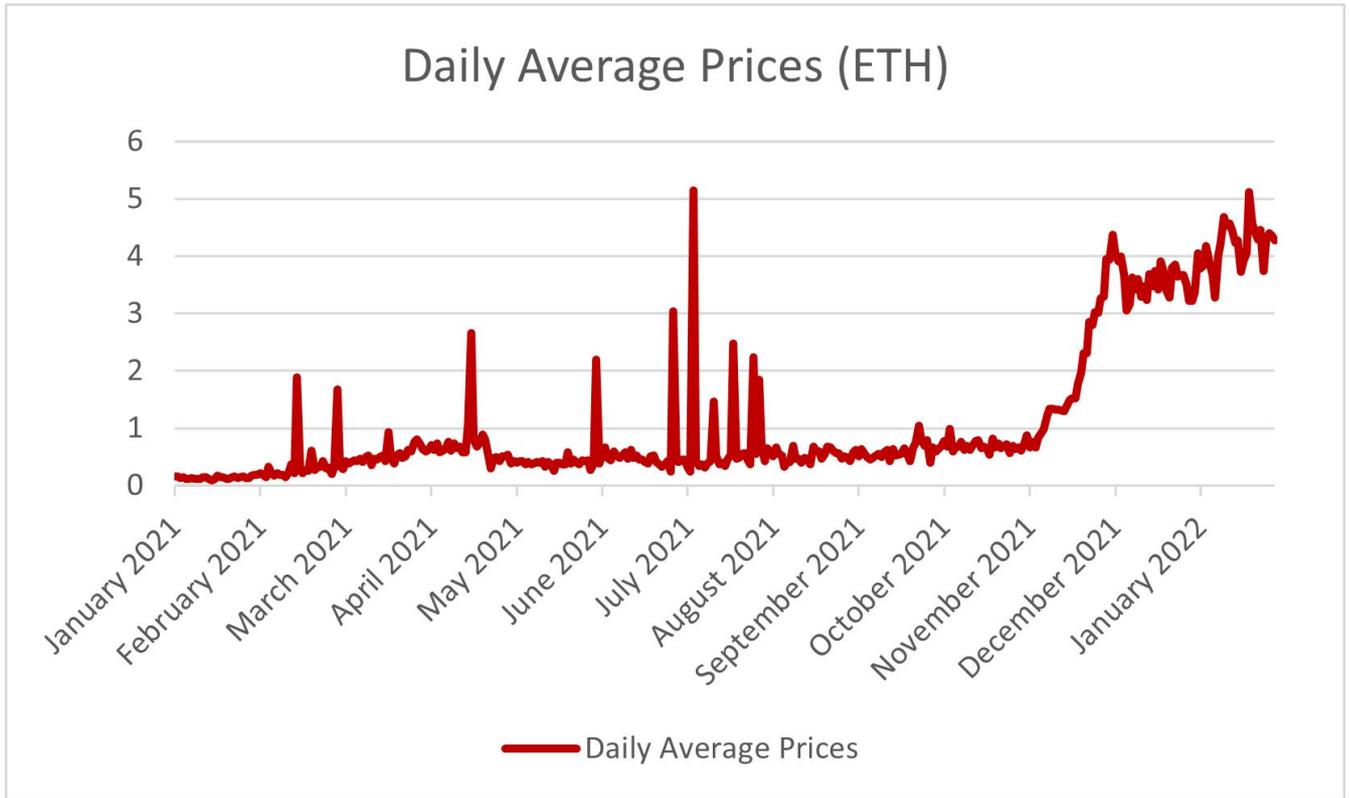
The graph shows that primary transactions used to be large and quite regular, and have now become scarcer since there is less land available.

At the same time, transactions on the secondary market averaged 90 from January to October, and then grew very significantly to reach an **average of 350 transactions per day in November and December**.

As of January 2022, most transactions on the Sandbox now are on the secondary market.

Average Prices

Figure 4



Prices for the Sandbox are denominated in SAND (on the primary market) and in ETH (on the secondary market on Opensea). Because they are denominated in cryptocurrencies, our analysis uses ETH as the main currency (because using USD would add a large element of volatility which does not reflect the behaviour of participants whose main referential is ETH).

The graph shows large peaks until Q4 2021, which are due to sales on the primary market as discussed. Those prices are not constant since they depend on the mix of lands sold (i.e. regular land at around 1ETH, premium land at 5ETH and Estates on auction).

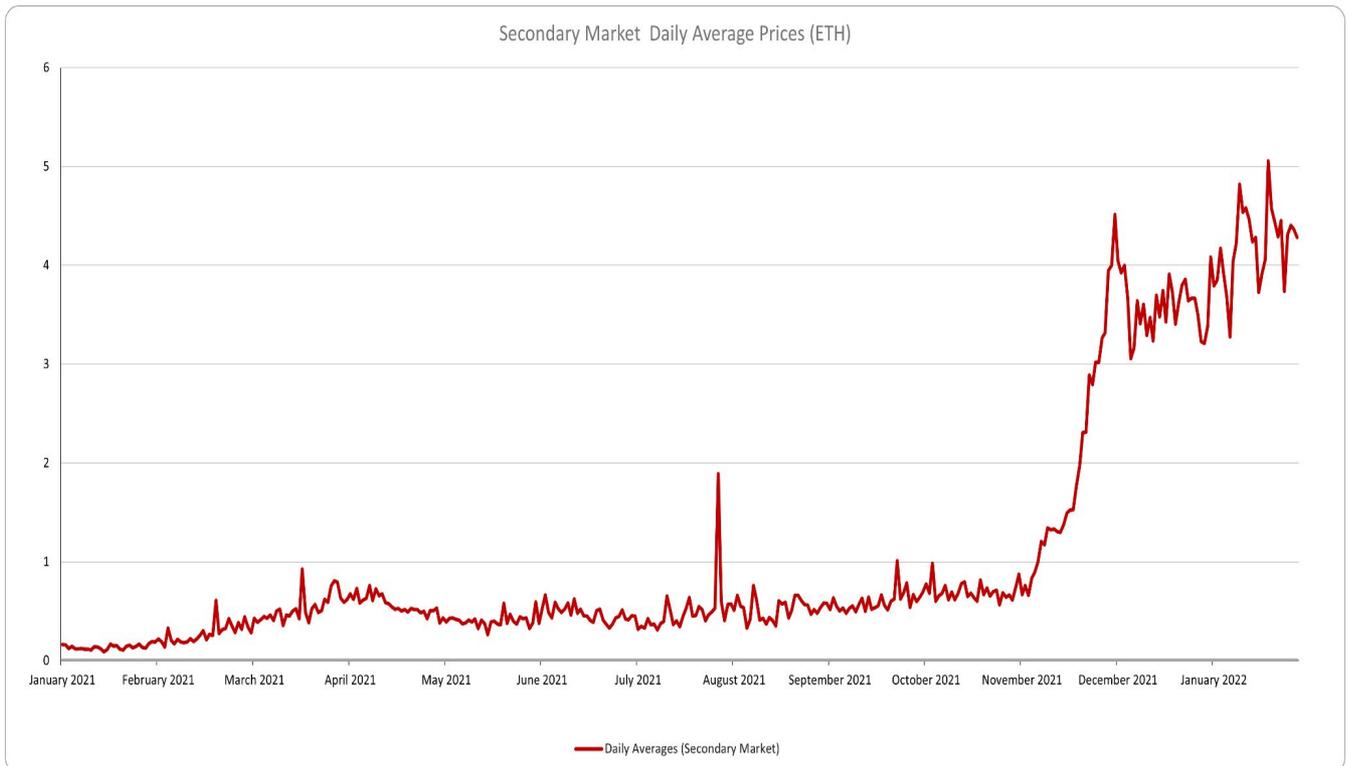
We can observe on the graph two different regimes: low average prices with some peaks (primary market) until November, then gradual increase of the average prices starting in November until January 2022.

The average price from **January to October 2021** was **0.53 ETH per land**.

The average price from **November to January 2022** was **3.20 ETH per land**.

Average Prices

Figure 5

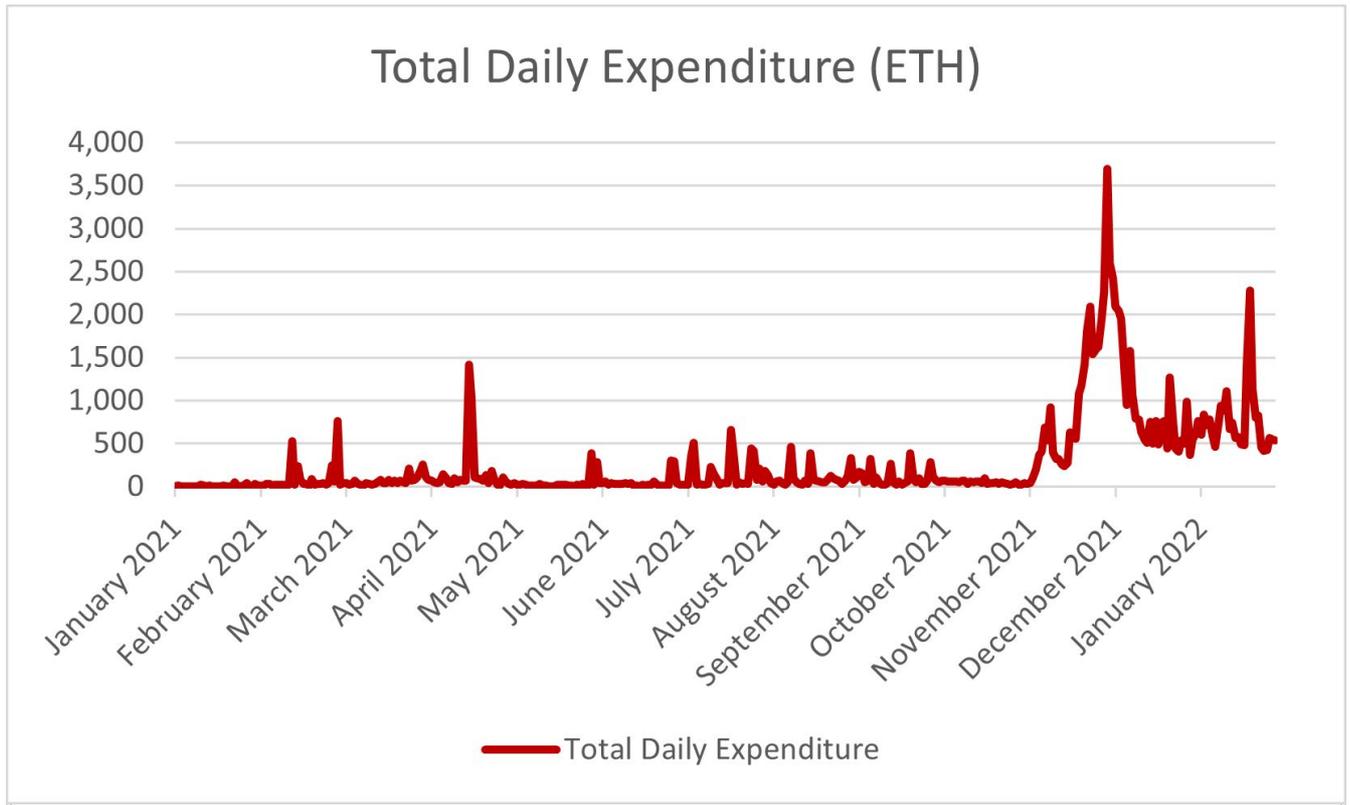


This graph shows the prices of the transactions on the secondary market only.

We can easily observe the two regimes, with a low and stable regime until November 2021 (prices around 0.5ETH), followed by a sharp rise leading to prices averaging 4ETH.

Total Expenditures

Figure 6



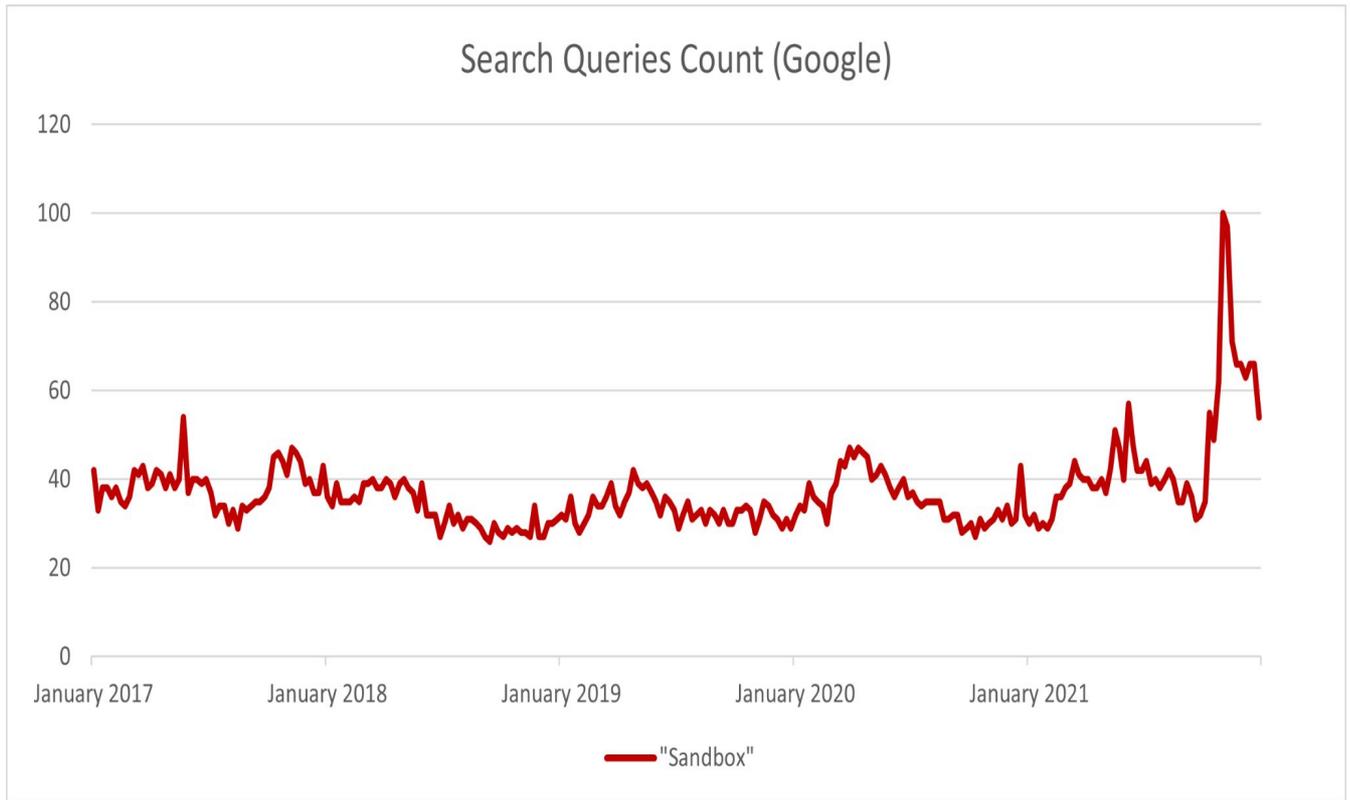
In line with the graphs on volume and prices, total expenditures on the Sandbox grew very significantly in November 2021, going from an average of 78 ETH per day before November to 900 ETH in November and December, i.e. more than a tenfold growth in activity.

We can notice that the peak in November and December is followed by a decline in January and demonstrates that the interest in land transactions is highly correlated to news and developments in the platform.

November and December was particularly busy for the Sandbox and saw a flurry of developments such as:

- Opening of the first Sandbox Alpha session for users to test the platform
- Launch of the Walking Dead Game Jam
- Buyer of \$450,000 land near Snoop Dogg and primary land sale near the Snoopverse
- Purchase of land by Adidas which also launches NFTs
- Investment of \$93m by Softbank, etc.

Figure 7



The correlation between news and volume / prices can also be evidenced by the analysis of Google Trends on the keyword Sandbox. We can observe the same behaviour with a peak of interest in "Sandbox" in November and December.

As a financial asset, it seems that Sandbox land prices display an idiosyncratic behaviour, i.e. are much more influenced by Sandbox developments rather than general NFT or cryptocurrency developments.

Heatmap

We analysed all the transactions on the secondary market from 20 November 2021 to 20 January 2022. Overall, 21,000 transactions were taken into account.

By analysing these transactions, we found out that there were several neighborhoods that were more expensive than others - for example the neighborhood around the Snoopverse is in high demand.

The Sandbox map was split in 16 areas, and the results show the following:

- The Central area (which is also the historical area) is the most expensive with prices exceeding **4.25 ETH / land**
- The other historical areas and those more densely populated are slightly less expensive than the Central area and are priced **between 3.75 to 4.25 ETH / land**
- And the more affordable ones tend to be the new neighborhoods and close to the borders of the map, they tend to be at **less than 3.75 ETH / land**.

It should be noted that only two thirds of the land is currently available, and one third is still remaining. The “black” areas could therefore be inhabited at some point, and it will be interesting to see whether they will be priced according to their locations or their dates.

Heatmap

Figure 8



Less than 3.75ETH (~\$11,000)	Between 3.75 and 4.25 (~\$11,000-\$13,000)	More than 4.25 ETH (~\$13,000)
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Conclusion

Land transactions on the Sandbox have considerably increased between January 2021 and January 2022, with **prices going from 0.5 to 4 ETH and total expenditures rising more than tenfold.**

Because of the increased number of transactions, some trends have started to appear, such as:

- **Prices vary by location and famous neighbours**
- **Volume and prices are highly dependent on the developments and news linked to Sandbox**

In some ways, price behaviours on the Sandbox are not dissimilar from real estate in a large city such as London, with prices based on location, and property buyers wanting to be part of a vibrant ecosystem.

This is the vision that landowners are buying into, although the Sandbox is still a very young platform, and still needs to prove that initial interest will translate into proper user / gamer adoption.

Whether they succeed or not is anyone's guess - the business model of platforms is intrinsically hard to predict, with small variations leading to vastly different outcomes - but there is much to learn already from Sandbox lands:

- (Some) people are more comfortable to attribute value to digital assets.
- Whole ecosystems are being built that allow for the transfer and exchange of these assets.
- ETH is becoming the main currency of this digital world.

The next few years will continue to bring fascinating developments, and it will be very interesting to see how the Sandbox will evolve.

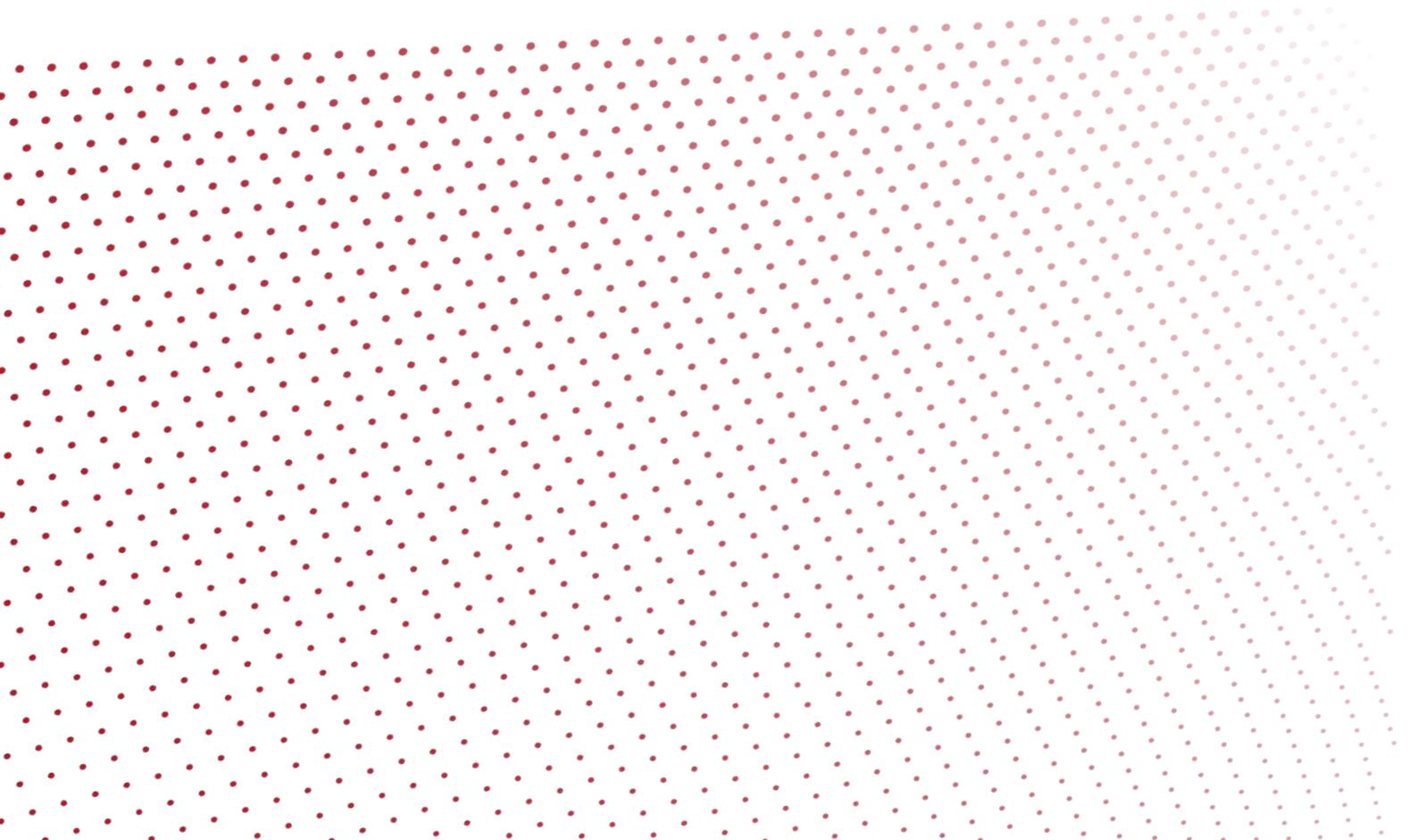
Appendix

Real Estate in The Metaverse



Report Methodology

Metaverse Real Estate Market



Methodology

Table 1

Coordinates Utilised for the Segmentation			
$(-204,102):(-103,203)$	$(-102,102):(-1,203)$	$(0,102):(101,203)$	$(102,102):(203,203)$
$(-204,0):(-103,101)$	$(-102,0):(-1,101)$	$(0,0):(101,101)$	$(102,0):(203,101)$
$(-204,-102):(-103,-1)$	$(-102,-102):(-1,-1)$	$(0,-102):(101,-1)$	$(102,-102):(203,-1)$
$(-204,-204):(-103,-103)$	$(-102,-204):(-1,-103)$	$(0,-204):(101,-103)$	$(102,-204):(203,103)$

CFTE has gathered a sample of 21,000 unique “land” transactions from NonFungible and Etherscan (from 19 November 2021 to 16 January 2022). We chose to select the transactions after 19 November, which has been a different regime than the first part of 2021, with prices quite stable after this date.

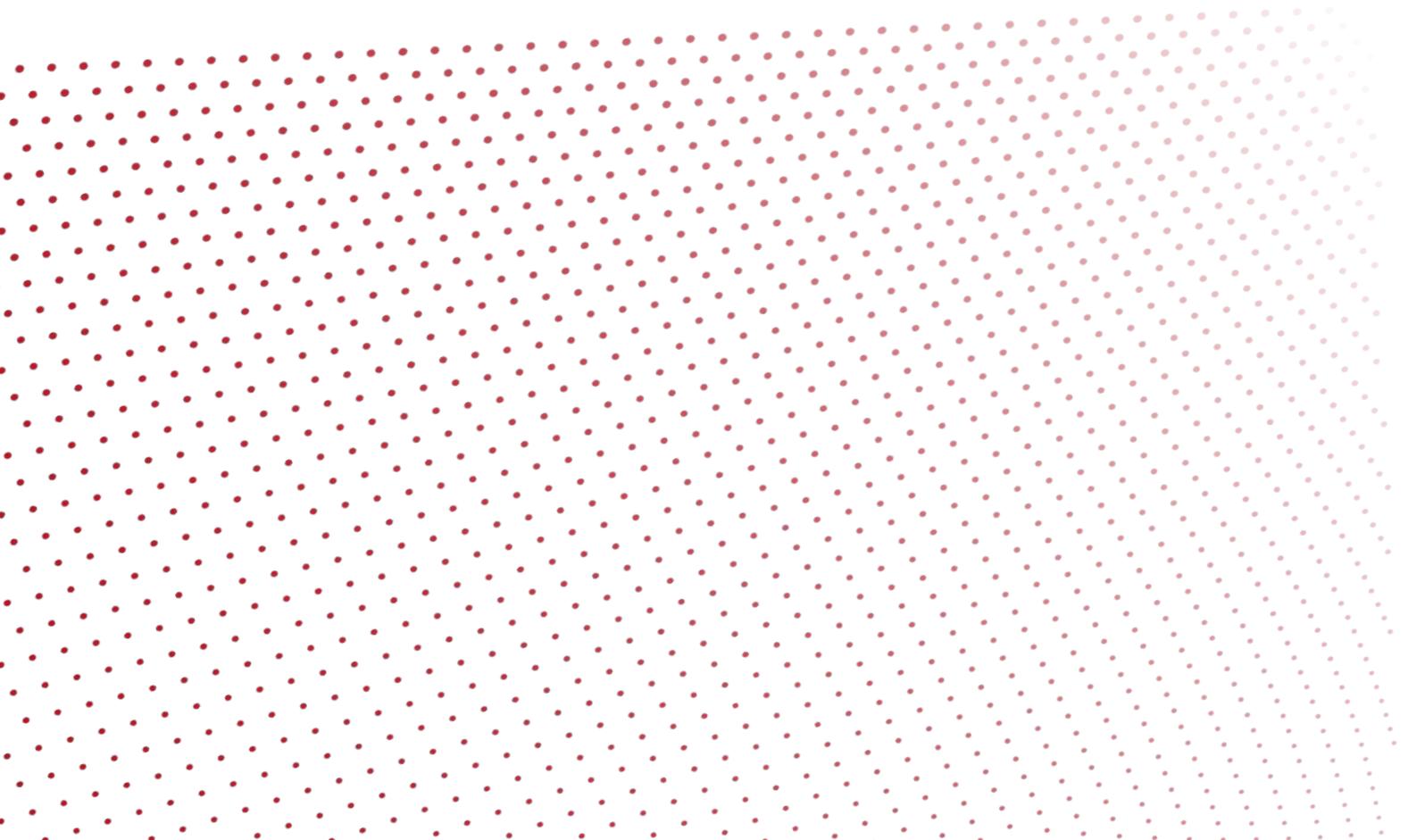
Due to a considerable variability of currencies used in transactions (including USDC, DAI, etc.), only transactions in the platform's native token (SAND) or Ethereum (ETH) were considered. SAND transactions were converted to ETH at the prevailing rate. After the data were cleaned and standardised, they were integrated into the grid which was divided into 16 equal zones to draw conclusions about geographical price variability and corresponding means.

We decided to exclude all transactions with a price lower than 2 ETH. This is a methodological choice based on our experience with Sandbox transactions, where very low prices (i.e. 30, 50 or even 90% lower than normal prices) tend to be friends and family transactions and happen at random.

In order to have an idea of the macro trends, we also analysed the data from January 2021 from NonFungible. Because this is a new market, one cannot guarantee 100% accuracy in the data, however our daily experience of the market gives us confidence that the results give a good idea of the trends and behaviours on the Sandbox.

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Metaverse Real Estate Market



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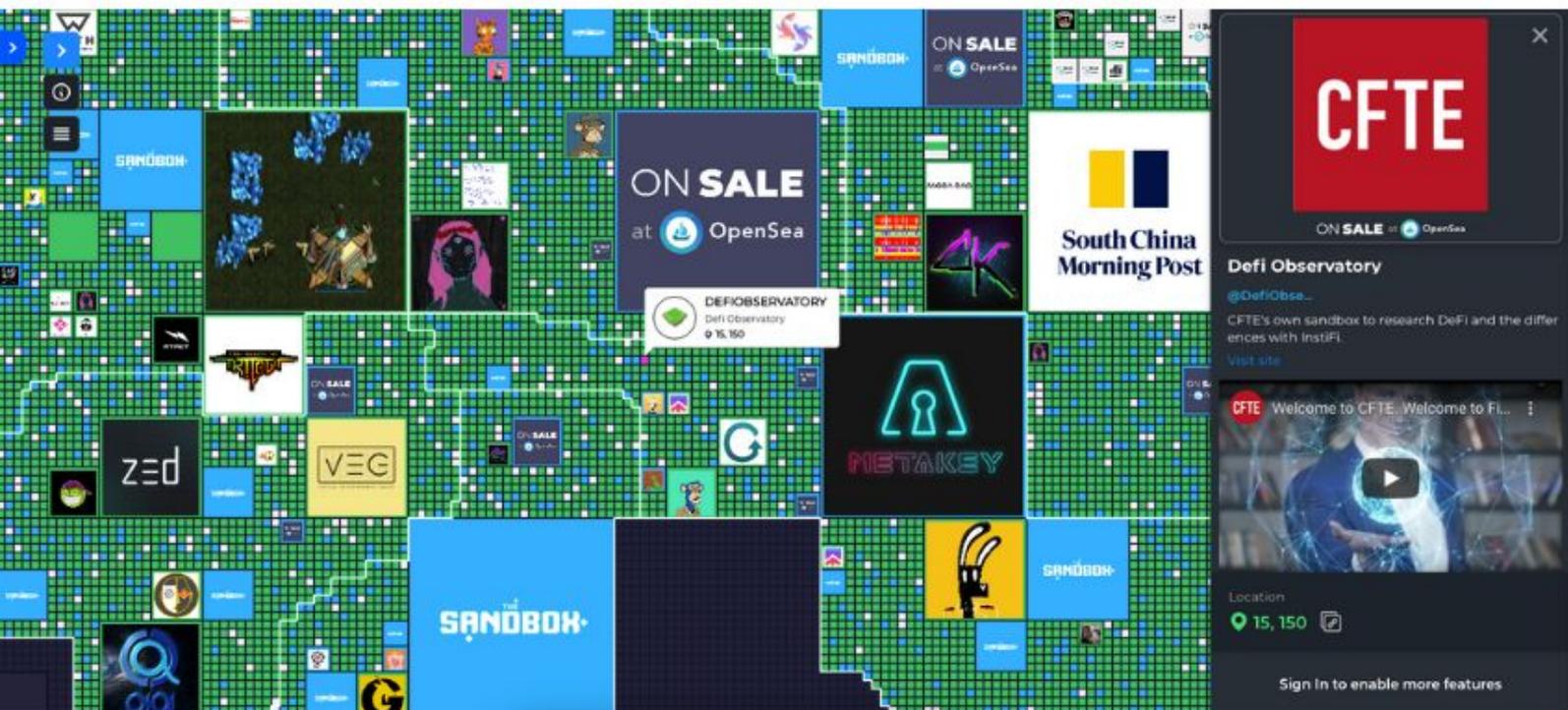
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Metaverse Real Estate Market
Sandbox Heatmap