

DIGGING DEEPER

MONACO 2070



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A bold vision for the Principality

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CP110

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I. The State of Monaco Today

Monaco is a European microstate, sandwiched between France and the Mediterranean Sea. Almost 40,000 people cram into about two square kilometers of land, an area smaller than that of Central Park in New York. These numbers make Monaco the second-smallest country in the world, as well as the most densely populated independent nation. The city and the state are one and the same, and both fall under the control of Prince Albert II, member of the House of Grimaldi which has ruled Monaco since 1297. The almost absolute power of the reigning prince ensures efficient implementation of policy. This allows us to not limit ourselves in regards to the feasibility of the recommendations put forth in this vision.^{2,3}

In some sense, Monaco is already the perfect city. Residents do not pay income tax or any kind of property tax. The unemployment rate hovers around two percent. The gross domestic product per capita is well over \$100,000 USD, the third-highest total among any country in the world. Life expectancy at birth is over 89 years, and absolutely zero residents live below the poverty line. While Monaco is not a member of the European Union, it still enjoys some of its benefits through agreements with France, namely the Euro currency and an open border. Ease of access, idyllic views of the Mediterranean, and the famous Monte Carlo Casino ensure hundreds of thousands of tourists pass through the principality every year.^{2,3}

In large part because of the tax policy, Monaco is a known haven for the super-rich. As Anne-Marie d'Hauterive writes, "Choosing to reside in Monaco is to declare one's affinity for luxury."⁴ However, while the city has an abundance of wealth, it does not have an abundance of housing. While the government offers a "housing-capitalisation contract," an entitlement to public housing for Monegasque residents, the vast majority of housing is on the private market. As the global rich grow richer, demand for housing is also rising. Of course, any form of outward expansion is limited by either the city's political boundary with France or its natural boundary with the sea. Increased demand and severely constrained supply means that housing costs are shooting up, in some cases forcing longtime residents out⁵. This vision's primary goal is to address the crises of housing shortage and affordability within the principality.

² Monaco Statistics

³ CIA World Factbook

⁴ d'Hauterive 2001

⁵ Cox

II. Planning Before 2020

In 1861, Monaco's treaty with France guaranteed its independence but also significantly reduced its territorial claims. With just a tiny strip of land, Monaco was left with no natural resources. All the city had to offer was the beautiful scenery of the Mediterranean Sea. With no natural beaches, Monaco needed some kind of competitive advantage over other nearby resorts, and it found one through a focus on promoting luxury. Thus, the reigning princes decided early on to invest in high-class tourism with the construction and expansion of the Casino de Monte-Carlo. While Monaco has diversified somewhat in the 150 years since, the casino still funds the monarchy, and tourism and retail make a large portion of the country's economic activity.^{6,7}

Monaco is vastly different from other cities in that it is also its own independent state. If the city fails, there is no higher level of government that can bail it out. Therefore, the reigning princes have historically taken a "sustainable" approach to planning to ensure the city's very survival. Losing what makes Monaco unique—its architecture, the luxurious lifestyle, or its natural beauty—would be end of Monaco, not only in terms of political independence, but also in terms of being a well-functioning city that cares for its natural environment and is an attractive place to live.⁶

As a resort town, Monaco has had to balance the needs of its permanent residents with the demands of tourism. Tourism in other parts of the world can have drastic consequences for the environment, particularly in vulnerable areas such as coastlines, and Monaco has tried hard to reduce its impact.⁹ For example, ongoing land infill projects include the relocation of marine wildlife and the installation of artificial habitats.¹⁰ When the railroad tracks and train station were relocated underground, it was mandated that 55% of the freed land remain open space.⁷



Casino de Monte-Carlo, c. 1910⁸

⁶ d'Hauterive 2005

⁷ d'Hauterive 2001

⁸ Gilletta

⁹ The Global Development Research Center

¹⁰ Neate

Monaco has also traditionally favored multifunctional land use. Stade Louis II, built in 1977 and home to AS Monaco, the city's professional soccer team, sits above of a parking garage, a public Olympic-sized swimming pool, offices, and an open gymnasium—all of which sits above land reclaimed from the sea.¹¹

III. Planning At 2020¹²

Monaco's current plan shares many characteristics with the plans of other "progressive" cities of Europe and North America. One such characteristic is having broad goals, with little substance on how to actually achieve them. For example, the "four pillars of sustainable development" are listed as:

- Managing natural heritage
- Implementing a climate and energy plan
- A policy for a sustainable town
- Mobilising the Monegasque community

However, that rhetoric is not completely empty. The city has in fact committed itself to being carbon neutral by 2050, and Monaco participates in many multinational partnerships, such as the Kyoto Protocol and the Paris Agreement. The reigning prince himself, H.S.H. Prince Albert II, even has his own foundation that helps fund projects and initiatives dedicated to understanding and limiting the effects of climate change—ranging from sustainable forest management in Myanmar, to the Sustainable Yachting Network closer to home.¹³

Another important aspect of the plan is titled "Soft Mobility," where the goal is "to reduce traffic in the neighbourhoods of Monaco whilst maintaining the development of business activity." Here, Monaco gets "smart", with a reference to the "next-generation data" that drives its bus-tracking system, or describing its focus on multimodal transport as "inventive." The city is trying to reduce its transportation footprint, such as offering parking permit discounts to those who drive electric vehicles, providing public escalators and elevators to encourage walkability, and implementing an electric bike-sharing program. However, the city still has over 15,000 public parking spaces, or almost one for every two residents. Despite the fact that Monaco's super-rich, including the prince himself, love to show off their fancy sports cars, this number should almost certainly be reduced.

¹¹ AS Monaco

¹² All information in this section is sourced from the "Policy & Practice" section of the official website of the Gouvernement Princier, en.gouv.mc, unless otherwise noted.

¹³ Prince Albert II of Monaco Foundation

While all of the above look like reasonable aims and good policy, the biggest issue facing Monaco today is a severe housing shortage and skyrocketing housing costs. Because of the nature of its borders, Monaco is already forced into density-oriented development. While that means that concerns over the effects of urban sprawl that have troubled other cities are off the table, it also means that there is just not enough space to fit everybody who wishes to live in the city. There is a notable lack of discussion on housing in the current plan.



Rendering of Urbanization En Mer¹⁴

That is not to say that Monaco is not trying. Older buildings, including the famous villas, are being knocked down and replaced by taller, denser, housing. The most ambitious development is a project entitled “Urbanization En Mer,” a land infill project that will add six hectares to the city. Sixty thousand square meters of indoor space will be built, including apartments and standalone housing, shops, and a parking garage, along with a green park and a coastal promenade. In total, housing is to be built for around 1,000 new residents, and the bulk of the cost is burdened by private developers. As mentioned earlier, environmental concerns are addressed with the curved shape of the infill that is intended to not block currents, as well as the installation of 3D-printed artificial coral reefs. Around 750,000 tons of material imported from France and Italy are currently being dumped into the sea, and the project is expected to be completed by 2025.^{15,16,17}

¹⁴ Freeze frame from “Monaco Offshore Urban Extension - Construction Methods”

¹⁵ L’Info-Chantiers En Temps Réel À Monaco

¹⁶ Neate

¹⁷ Scott

IV. Motivation for Vision 2070

Monaco can be seen as the perfect city, top of the charts in almost every economic and public health metric. Yet it is only perfect for perfect people. The beauty and character of Monaco should be enjoyed by everybody who wishes to enjoy it, not just by the supremely wealthy. According to Monaco Statistics, 86 percent of all of the city's workers, from bankers to retailers to casino dealers to janitors, live outside of Monaco itself.¹⁸ Of course, the urban lifestyle is not for everybody, but affordability should not be a barrier for those who wish to reside where they work.

There is no reason why Monaco can not become a city accessible to everybody, regardless of class, while simultaneously preserving the landscape that attracts so many to its streets.



A traditional Monegasque villa, not yet replaced with the modern development behind it.²¹

Obviously, with not enough housing to meet even luxury demand, in a city where even millionaires can no longer afford rent, it may seem quite infeasible that Monaco can provide additional housing for an entirely new population.¹⁹ Yet the reigning princes have never shied away from an infrastructural challenge, be it the numerous land infill projects, the Oceanographic Institute built in to the side of the rock, or the Forum Grimaldi, a modern convention center built partially underground.²⁰

What is the solution? The easiest answer, for most cities, would be outward expansion into empty space, yet this is clearly impossible in Monaco's case. While land infill is a clever idea, the city can only encroach so far into the sea before environmental and financial costs become too great. The next best solution that follows is density. Monaco has plenty of its old, famous villas that could easily be demolished and replaced by new high-rise condominiums. However, the city has already ventured too far down this path—as development has quickened in recent years, residents have voiced complaints over constant construction, as well as the disregard the government has shown for preserving traditional architecture.^{19,22} Therefore, if Monaco can not grow out, and it can not grow up, it can only grow down.

¹⁸ "Focus: Private-sector employees"

¹⁹ Cox

²⁰ d'Hautesserre 2005

²¹ Sotheby's Realty

²² de la Baume et al.

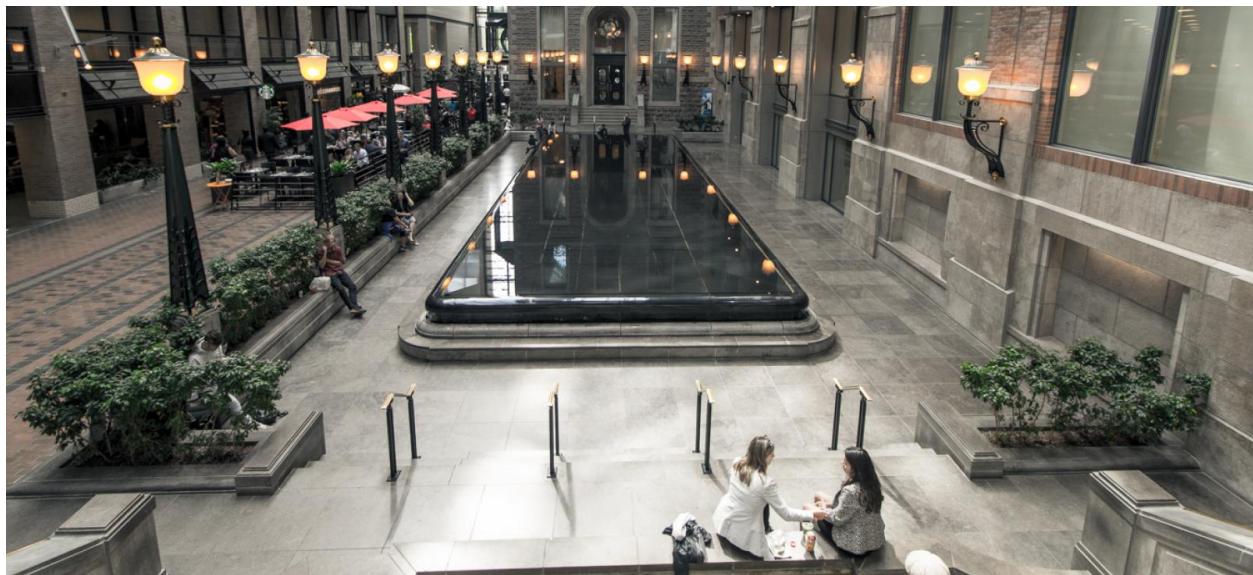
V. Vision 2070 - Digging Deeper

To create enough living space for an open Monaco, this vision proposes that the reigning princes from 2020 through 2070 and beyond support development of underground housing for all ranges of incomes. If the government agrees with our recommendation, the sheer power and wealth of the royal family will be enough to see this project through.

Who would want to live underground? At first thought, the idea seems preposterous. Humans are not chipmunks or badgers—we are accustomed to seeing the sun rise and set and breathing fresh air. However, an increasing trend in cities is the development of underground space for direct human use, and for more than just a subway system.

The most notable example is in Montreal, whose below-ground network is so wide it is known as the “Underground City.” More than 20 miles of pedestrian corridors link subway stations, shops, and office buildings throughout the city’s downtown.²³ A 1991 report, published 25 years after the opening of the subway, cited the network as a “success in terms of efficiency and comfort”:

The greatest point in its favor is its direct link with many subway stations, but other advantages can be noted: separation of pedestrians from cars, resulting in fewer accidents; avoidance of unpleasant extremes of outside weather (rain, snow, wind, cold); and enhanced commercial activity...²⁴



The Underground City of Montreal, formally known as RÉSO²⁵

²³ Tousignant

²⁴ Boivin

²⁵ Metta

Of course, Monaco does not have a subway, and it is far too small for us to propose building one. Instead, connections could be made between new apartments and the long-distance rail station already located underground, or other facilities such as the main convention center or soccer stadium. Monaco is also free from the harsh climate of Montreal, but one study of the Underground City found that outdoor weather actually had very little effect on its usage.²⁶ The example of Montreal shows that people are not afraid to use underground space for more than just necessity.

However, there is quite a large jump between using underground space for running errands and actually living underground. One intermediate step on which research has already been done is office space—most of an employed adult's sunlit hours are not spent at home, but at work. A study of office employees in Singapore, a city already experimenting with underground workspace, found that initial attitudes towards working underground were quite negative, with perception of calmness and safety, negative emotions, and confinement being the three main factors. Yet the paper also noted that many of these preconceptions could be addressed through engineering solutions, and that many people already working underground actually preferred their new environment.²⁷

Finally, while underground housing may seem a novel idea, there actually is precedent. Once again, the main goal of our vision is to provide enough housing for the influx of the super-rich, the class that Monaco has historically catered to, as well as housing for those who work in Monaco that are left excluded by the extraordinary costs. Underground housing has shown to be suitable for both populations. A recent trend in high-class residential areas, from the sprawling Hamptons to densely-packed downtown London, has been the construction of massive basements. Rich homeowners have found above-ground expansion limited by either zoning codes or simply sheer lack of space, and have instead decided to put their new bowling alleys, movie theaters, gyms, or even bedrooms below ground.^{28,29} On the other side of the spectrum, low-income workers in East Asian cities are choosing to live in downtown basements rather than the historically more typical remote suburbs. A study of Beijing's underground housing market concluded that "The ability to walk and/or bike to jobs as well as low rents, both of which allow for the possibility of accumulating savings, is worth making the choice to live in small underground rooms."³⁰ Both of the above cases show that underground housing is not infeasible, especially if built in the right manner.

²⁶ Zacharias

²⁷ Lee et al.

²⁸ "Encore: Housing Costs Inspire London Builders To Create Underground Mansions."

²⁹ Higgins

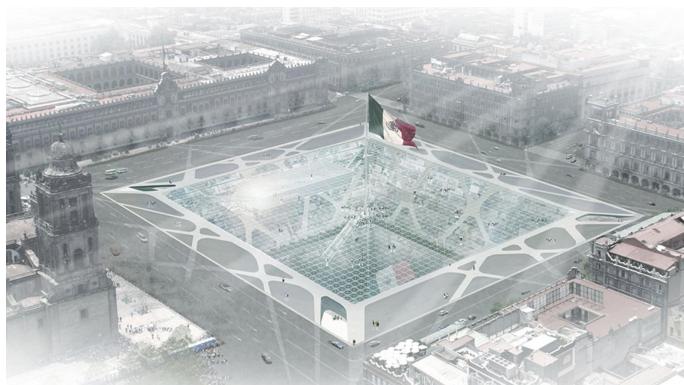
³⁰ Kim

VI. Implementing Our Vision - The Path to 2070

The first step towards opening Monaco is to extend the housing-capitalisation contract to any person currently employed within Monaco's boundaries. Unfortunately, the current plan states "The Prince's Government does not have the remit, except regarding certain priorities for the development of the territory, to intervene on the private real estate market."³¹ This has to change—the reigning princes have their hand in almost everything else in the city, so there is no reason they can not interfere with the housing market as well. Before a massive investment in infrastructure, the state can provide more public, affordable housing by modifying existing structures, such as subdividing large units at the expiration of a lease, or even creating units in unused areas such as basements. This would encourage those foreign commuters who may not currently be able to afford living in the city to move in, thereby getting the city acclimatized to hosting its new population.

However, opening up basements must only be seen as a temporary fix. Monaco can offer much more than Beijing. At the bare minimum, tens of thousands of new units must be built, primarily underground. The biggest challenge will be alleviating the concerns expressed about underground workspaces—confinement, claustrophobia, or negative emotions such as nervousness or loneliness. One possible answer is to connect everything to an open above-ground sunlight source. Monaco has actually already tried this to an extent with its new Forum Grimaldi, constructed partially underground to avoid blocking views of the sea. It has a large glass roof that allows natural light to reach each underground floor.³² Perhaps a model for underground housing can be found in the "Earthscraper," a project designed for

Mexico City. Housing for 5,000 people below ground looks out onto a kind of courtyard with a huge glass window above.³⁴ This sounds promising, but the main roadblock here is actually finding the empty space within the city to put such a window. Almost every square inch of Monaco is developed, and the few areas that are not should remain green space.



Earthscraper, a potential model for housing in Monaco³³

³¹ "Housing", Gouvernement Princier

³² d'Hauterive 2001

³³ BNKR Arquitectura

³⁴ Nash

³⁵ OSTILL/iStock

If new underground housing can't open up to the sky, the next best option is to create the illusion of being above ground. The core idea of the Earthscraper—an empty, central courtyard—could remain, just without an open surface. Instead, artificial light could mimic the sun, and at nighttime, the courtyard goes dark, and traditional indoor lighting takes over. These underground units would be available for all different income levels. The larger and more expensive units could cover multiple floors and perhaps be closer to the surface, and the more affordable units would be smaller and located farther down. All housing would have a window to the "outside", and of course all levels would be accessible by everybody.



The Rock³⁵

Another, secondary, implementation could be to take advantage of Monaco's jagged landscape. For example, one of the city's iconic landmarks is known as "The Rock," home to the royal palace, among other attractions. Within the next fifty years, it is quite possible that we will be able to bore into The Rock, carving out master bedrooms and kitchens along the way. This could become housing for the richest of the rich. For those who see the opening of Monaco's real estate to lower classes as antithetical to the city's tradition of luxury, they can imagine claiming an address as one right below that of Monaco's royal palace, with a beautiful panoramic view of the Mediterranean.

Whatever the final decision is, we have full confidence in Prince Albert II and his successors to see this vision through. Income from Monte Carlo, as well as all of the family's other investments, should be more than enough to fund a project at such scale. By 2070, Monaco will be open for all.

VII. Conclusions

Monaco, a completely urban microstate on the border of France and the Mediterranean Sea, has long survived as a luxury resort town. The city's current plan already calls for noble action in regards to protecting the environment and mitigating the effects of climate change, and we leave plenty of room in this new plan to achieve those targets. We also expect all of the other social programs for which Monaco is well-renowned, such as its health care and education system, to be completely maintained. However, where the current plan fails is housing. Many of the city's residential blocks have long been considered the most expensive in the world., but globalization and the growing number of billionaires have put even higher pressure on housing prices. These pressures provide the opportunity for a new vision—the construction of tens of thousands of underground housing units to satisfy not only the demands of billionaires, but anyone else who wishes to enjoy all that Monaco has to offer. Many workers commute to Monaco from France and Italy every day, and making housing available to them will not only make their lives easier, but will reduce the negative environmental effects of transportation. Thus, "Digging Deeper" refers not only to the literal digging below ground to build new housing, but also the city digging deeper into social class pyramid, beyond just the very top for which it has long catered.

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