URBAN DESIGN STUDIO 2022
Theme B: LOW CARBON

日本橋東2050

Nihombashi east 2050

Designing LOWCARBON Urban Neighborhood
SITE: Nihombashi East, ChuoWard

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低炭素を目指した2050年の地区デザイン

対象地：日本橋東地区（中央区）

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要約｜Summary

東京都中央区日本橋の敷地における 2050 年の地区再生戦略を作った。二酸化炭素の排出量を減らすまちづくりを通じて低炭素社会を実現することを目的とし、カーボンマップ、数値流体計算による風解析など定量的な手法で分析した上、建物、オープンスペース、道路、インフラを含めた総合的な都市デザイン案を作成した。

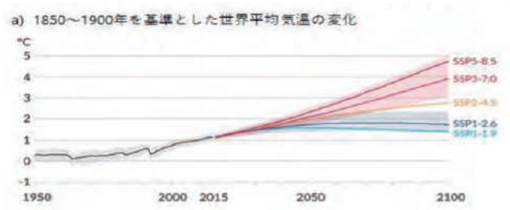
In this studio, we develop an urban regeneration strategy and urban design proposal for buildings, open spaces, streets and infrastructure of the designated model neighborhood in Nihombashi East, ChuoWard, Tokyo. To design and assess our proposal, we also utilized Carbon Mapping and Computational Fluid Dynamics (CFD) methodology.

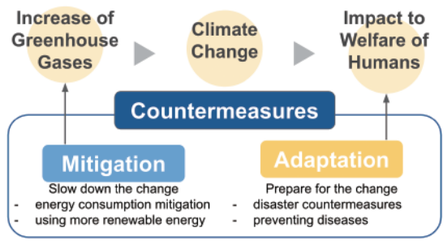
01　1 気候変動の懸念と低炭素社会の必要性

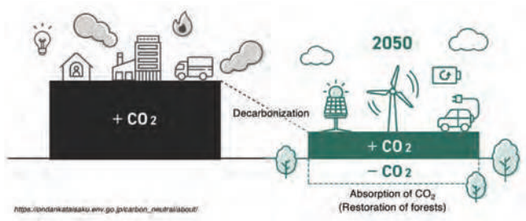
Climate Change Risk and the Necessity of a Low Carbon Society

現代生活や経済・社会システムは安定的で豊かな環境の基盤の上に成立している。しかしながら人間活動の増大は、地球環境へ大きな負荷をかけており様々な形で地球環境の危機をもたらしている。気候変動問題はその中の一つで、IPCC レポートによると、2100 年までに気温は 3.2 度上昇する可能性がある。
気候変動にともない、海面の上昇、災害の激甚化、暑熱などさまざまな問題が複合的に起こり、人間文明の存続が危ぶまれる。気候変動の原因は「間違いなく」人間の過剰な活動にともなう、二酸化炭素の過剰な排出である。よって、特に人が集中している都市部において、右側のグラフに示した都市計画の手法で二酸化炭素の排出量を減らすことで、持続可能な人間社会の実現に貢献できる。

The increase in human activities, is placing a heavy burden on the global environment and is causing a global environmental crisis in various forms. According to the IPCC report, the temperature is likely to increase by 3.2 degrees Celsius by 2100. With climate change, the survival of human civilization is threatened by a combination of various problems. The cause of climate change is "undoubtedly" the excessive emission of carbon dioxide due to excessive human activities. Therefore, reducing carbon dioxide emissions, especially in urban areas, will lead to the realization of a sustainable human society.







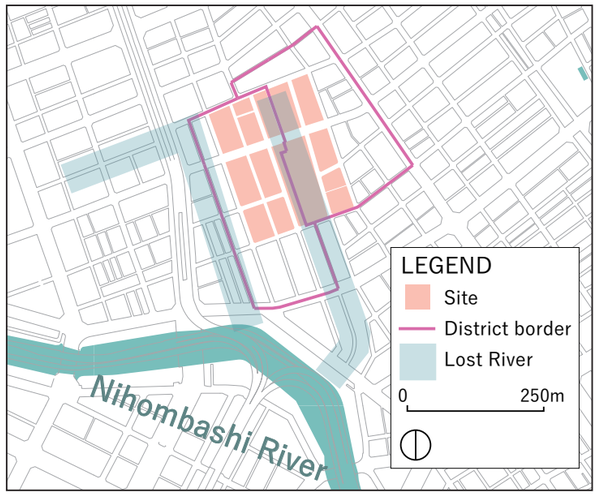
01　2 日本橋の文脈を読む｜Context of Nihombashi

低炭素都市の検討対象として、日本橋東地区を取り上げる。対象地域の概要を示す。

出典：三井不動産(2019), 都心とウォーターフロントを結ぶ舟運ネットワーク

近世：日本橋は交通・物流の要所であり、問屋街が発達。水路網を使って船荷が運び込まれた。
近代：徐々に水運から陸運へ移行。道路網を整備するため、水路や河川は埋立･暗渠化され、周辺はビジネス街へと変わっていく。
現代：公共空間への関心の高まりを背景に、高速道路を一部地下化し、水運を復活させようとする動きがある。

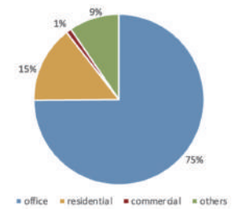
Early Modern：Nihombashi acted as a hub for water transport, a means of mass rapid transit, and was developed as an Edo merchant district.
Modern：It showed a gradual shift from water to land transport. Waterways and rivers are reclaimed and culverted to make way for road networks.
Post Modern：Against a background of growing interest in public space, there are moves to partially underground highways and to revive water transport.



対象敷地は堀留町、小舟町にまたがる 13 街区、約 5 ha　である。江戸時代には 2 本の運河があり、水運を利用して物流を担う船荷問屋が多く集まる街だった。
現在でも建物の多くが低中層であり、建物全体の　75％がオフィス、15％が住宅として利用されている。

The site comprises 13 blocks spanning Horidomecho and Kobunacho, covering an area of approximately 5 ha, which was home of many shipping wholesalers who used water transport in Edo period.
Today, most of the buildings are still low and mediumrise, with 75% of the total building stock used as offices and 15% as housing.

500 employees
1100 residents
FAR **320%**
BCR **48%**



02 検討手法｜Methods

Plan Alternatives → Scenario Making → CO2 Calculation → Urban Design → Assessment

左に示す流れで検討した。最終的には将来のシナリオにもとづく複数案を提示し、その評価をする。

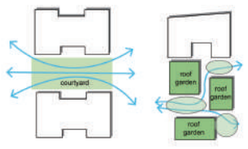
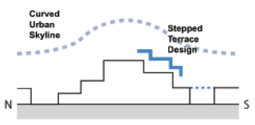
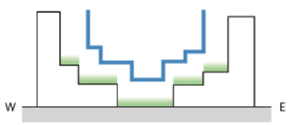
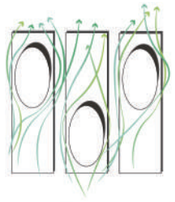
We consider the flow shown on the left. Several proposals based on future scenarios are presented and evaluated.

03 プランニング案の比較・評価｜Plan Alternatives and Assessment

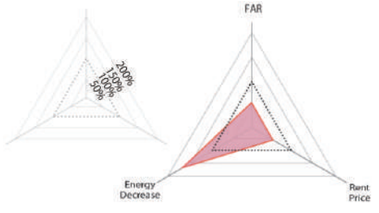
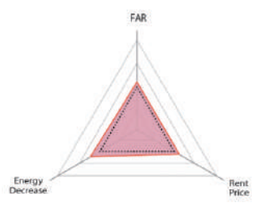
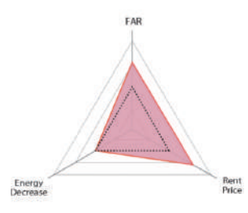
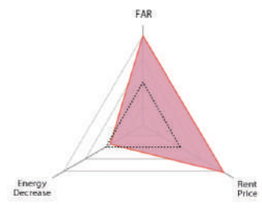
地区における低炭素都市像を検討するにあたり、地区の開発像を明確にする。
容積・用途割合・人口密度が異なる 4 案を検討・比較した。
その結果、開発をする上でのコンセプト・スケール感が整理され、最終的に高容積・低容積の 2 案へ統合された。

In studying the lowcarbon urban vision for the district, the development image of the district was clarified. Four proposals with different volumes, use ratios, and population densities were examined and compared.
As a result, the concept and scale of development were sorted out, and finally integrated into two proposals, one with a high volume and the other with a low volume.

プランニング案の比較 ¦ Plan Alternatives

	Human Scale	Business As Usual	Medium Size Green Development	Mosaic
Urban Form				
Concept	開発需要が下がり、低層住宅街となる案 Proposal of lowrise residential area with lower demand for development	エキスパートジャッジの結果、開発される見込みが高い 2 街区で再開発。他は個別建て替え Expert judges result in redevelopment in two areas with high development prospects. The others will be reconstructed individually	中程度の開発需要を見込んだ案。基壇部を緑化し、開発対象地全体が公園のようになる Proposal of moderate development demand. The base will be greened and the entire subject site will resemble a park	開発需要の増大により、再開発が進んだ案 Proposal of redevelopment due to increased demand for development
Design Strategy				
	住民向けの中庭や街区内の公園などにより十分な採光を得る Courtyard and roof garden are designed to get more daylight and public spaces	階段状のテラスデザインとすることで山型のスカイラインに The curvilinear skyline has been designed	公園に向かって下がるテラスデザイン、ルーフガーデンの設置 The building is designed on a staircase that lowers toward the center	タワーの配置により風の道を創出し、暑熱に適応 The placement of the towers creates wind paths and adapts to the heat
Data	**600** employees (2100) **1500** residents (+830) FAR: **180**% BCR: **45**% Max Bldg. Height: **20**m	**3900** employees (+200) **900** residents (+230) FAR: **350**% BCR: **48**% Max Bldg. Height: **90**m	**4800** employees (+1100) **1450** residents (+780) FAR: **490**% BCR: **50**% Max Bldg. Height: **144**m	**6700** employees (+3000) **3000** residents (+2230) FAR: **640**% BCR: **65**% Max Bldg. Height: **100**m

プランニング案の評価 ¦ Assessment of the Alternatives

	Human Scale	Business As Usual	Medium Size Green Development	Mosaic
				
	CO2 排出量に対するリターンが最も高い、低炭素実現のため最も望ましいシナリオ Highest return/CO2 value preferable result for low carbon	低炭素を実現しながらも、エリアの価値を向上させることができる Enhance area value while archieving carbon emission mitigation	比較的良いバランスだが、エネルギー消費を減らすためにさらなる策が必要 Relatively good but need some more strategies to decrease energy consumption.	CO2 排出量の増加を抑えながら、非常に大きな経済効果を生み出すシナリオ Very high $ return while the carbon emission increase being limited

	Human Scale	Business As Usual	Medium Size Green Development	Mosaic
SOCIAL				
Open Space Access	◎	△	◎	○
Consideration to Region	◎	△	◎	△△
ENVIRONMENTAL				
Energy Comsumption	◎	◎	○	△
Wind Path	△	△	◎	◎
ECONOMIC				
Rent Price Validity	◎	△	△△	△
FAR	○	◎	△	○

低層開発シナリオでは、オープンスペースにアクセスしやすい・周辺地域への好影響など、社会的側面で特に評価できる一方で、開発を抑制するため、金銭的リターンが見込めない場合がある。高層開発シナリオでは、タワーを中心とした開発で地区に風の通り道ができ、経済効果も大きいが、再開発などに伴いエネルギー消費量が大きくなる。

While the lowrise development scenario can be particularly valued for its social aspects, such as easy access to open space and positive impact on the surrounding community, it may not provide a financial return because it discourages development. In the highrise development scenario, towerbased development creates breezeways in the district.

04 2 案をとりまく2050年における社会前提の整理｜2050 Socio Economic Context

上記のシナリオは敷地の現状を踏まえて作成したものであり、シナリオを具体化する前に、将来の社会経済状況の分析に基づき、シナリオの設定を確認する必要がある。2050 年の社会状況は不確実であるため、2 案のどちらが実際に起きるかは分からない。そこで 2 案に対し、前提となる社会状況を個別に設定し、明確化した。設定した社会像は、以降の CO2 排出量の計算や、都市デザインの前提にもなる。

The above scenarios were developed based on the current status of the site, and the scenario settings need to be confirmed based on an analysis of future socioeconomic condition, before creating the scenario details. Since the social situation in 2050 is uncertain, it is not known which of the two alternatives will actually occur. Therefore, we have clarified the social conditions that are assumed for each of the two alternatives.

Common Issue

SOCIAL
東京都の人口が 1300 万人を割り込む区部でも 40% 以上の高齢化率

The poplation of Tokyo will be below 13,000,000
Over 40% aging rate even in metropolitan area

ENVIRONMENTAL
気温：2022 年と比べて +0.4 °C
降雨：豪雨時の降水量が＋20%
通風：2040 首都高日本橋区間地下化により風が流れやすくなる

Temperature: +0.4°C from 2022
Rainfall: +20% precipitation during heavy rainfall
Wind: In 2040, the undergrounding of the Nihonbashi section of the Metropolitan Expressway will facilitate wind flow

ECONOMIC
日本の市場規模が半減する可能性

Japan' s market size halved

Social Condition Assumption1

SOCIAL
ミニマル社会、モノ消費からコト消費
Minimalist society, consumption of things to consumption of things
ENVIRONMENTAL
ソフト的な環境適応策
soft environmental adaptation measures (green, walkability for the elderly)
ECONOMIC
住宅用途拡大、商業用途縮小（公共空間周辺は増加）、オフィス需要縮小
more residential space, less commercial use but more commercial use adjacent to public space, shrinking office demand

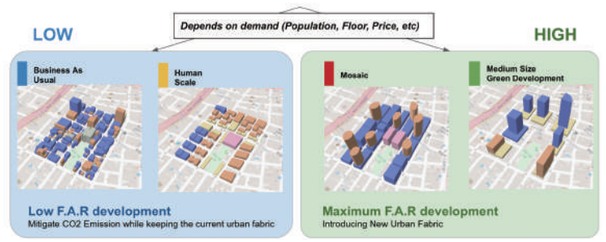
Social Condition Assumption 2

SOCIAL
競争社会、さらなる都心への移住
competitive society, further migration towards urban centres
ENVIRONMENTAL
ハードなインフラと付随する環境適応策
hard infrastructure and accompanying environmental adaptation measures
ECONOMIC
オフィス需要堅調、業務・生活環境の改善
demand for office space remains strong; improved work and living environment that secures worklife balance

プランニング案の統合 ¦ Integrating the Alternatives

この2つの異なる社会経済文脈に適合するように、4つのシナリオを2つに統合した。
1. 現状の容積程度の案
2. 現在の最大容積まで開発する案

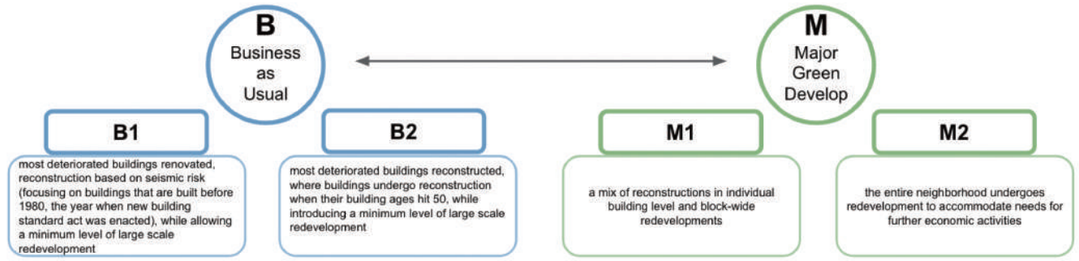
Conclusively design 2 final proposals for urban design
1. Low F.A.R. development
2. Maximum F.A.R. development

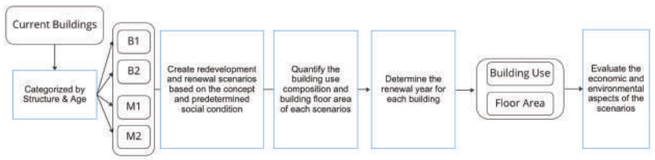


05 シナリオの具体化｜Details of the Scenarios

２０５０年のシナリオに基づくシナリオ設定｜Creating Scenarios

2050 年時点で想定される 2 つの社会的コンテクストを具体化するため、B･Mそれぞれの幅の中でさらに二つの異なるシナリオコンセプトを作成した。
Two scenarios were developed within each of the B and M contexts to create concrete form to each of these contexts envisaged for 2050.





左のフローチャートに示される手順でシナリオごとに建物更新方法･建物用途･延べ床面積･建物更新年を設定し、それらに基づき経済･環境面での評価を行った。

The procedures shown in the flowchart on the left were used to set the building renewal method, building use, total floor area and year of building renewal for each scenario, and the economic and environmental aspects were assessed based on these.

更新方法（建て替え、リノベ、再開発）の決定基準｜Means of Renewal (Renovation, Reconstruction, Redevelopment)

上のシナリオコンセプトに基づいて、B1をリノベーション基軸に、M2を再開発基軸に設定し、建替棟数、再開発街区が段階的に増加するようにB2とM1を設定した。

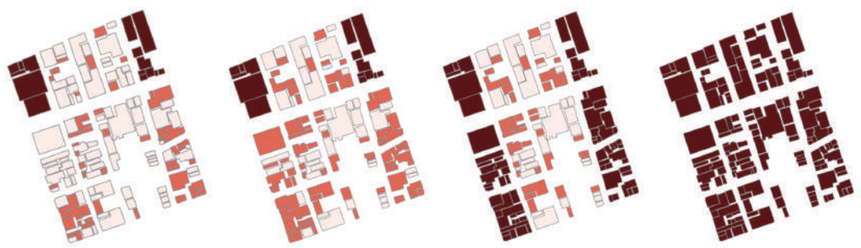
Based on the scenario concept above, B1 is set as the renovation extreme and M2 as the redevelopment extreme, with B2 and M1 set so that the number of buildings to be rebuilt and redevelopment zones increase in stages.

	B1	B2	M1	M2
Redevelopment	All buildings in blocks A1 and A5 15 buildings in total	All buildings in blocks A1 and A5 15 buildings in total	If more than 60% of the area of the building floor area in the block is subject to reconstruction in the B2 scenario, all buildings in the block will be redeveloped 74 buildings in total	All buildings 154 buildings in total
Reconstruction	･All wooden buildings ･Steel-framed buildings (before 2000) ･RC construction (before 1980) 57 buildings in total	･All wooden buildings ･Steel-framed buildings (before 2000) ･RC construction (before 1989) ･All buildings below three storeys 96 buildings in total	Buildings subject to reconstruction in the B2 scenario other than those mentioned above. 46 buildings in total	0 buildings in total
Renovation	Other than the above 82 buildings in total	Other than the above 43 buildings in total	Other than the above 34 buildings in total	0 buildings in total

更新方法マップ｜Map of Renewal Method

更新基準に基づき、各シナリオの建物ごとの更新方法をプロットした。
Based on the renewal criteria, the means of renewal for each scenario is plotted.

renovation
reconstruction
redevelopment



更新後の床面積・用途の設定｜Floor Area + Building Use Algorithm

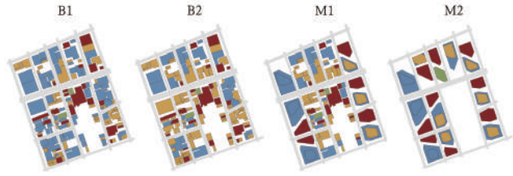
各シナリオにおいて、更新後の面積と用途を以下の表のように設定した。
再開発及び建替による採算性を考慮して、再開発･建替では延べ床面積を増大させている。
建物用途については、想定する2050年の社会経済状況に基づき、建替･再開発において適宜用途を変更している。

In each scenario, the area and use after renewal are outlined in the table below.
The total floor area is increased in the redevelopment and reconstruction scenarios in order to take into account the profitability of the redevelopment and reconstruction.
With regard to the building use, the building use is adjusted in the reconstruction and redevelopment based on the assumed socioeconomic situation in 2050.

Means of renewal	Total floor area of building after renewal	Updated building use			
		B1	B2	M1	M2
Redevelopment	Floor space required to meet 600% FAR	Apply the current proportion of uses in the block to the redeveloped building.	same as on the left	same as on the right	･South of block A3: hotel. ･High-rise buildings in blocks around the park: offices at the base, residential at the upper levels. ･Low-rise buildings in blocks around the park: commercial ･Three blocks west of the site: low-rise buildings: commercial, high-rise buildings: office
Reconstruction	Current building area × (current number of storeys x 1.2 rounded up)	Office as main use ･The area and shape of the footprint makes it difficult to convert to residential use: office. ･Not next to the park + contains commercial, residential or office uses: commercial on the ground floor and residential above. ･Not next to the park + contains residential and office uses: office on the ground floor and residential above. ･Next to the parks: commercial on the first and second floors, residential above. Commercial as main use Status quo Residential as main use ･currently residential use only: residential use. ･contain other uses: same provisions as for offices. Others Status quo	same as on the left	same as on the left	
Renovation	status quo	status quo	status quo	status quo	

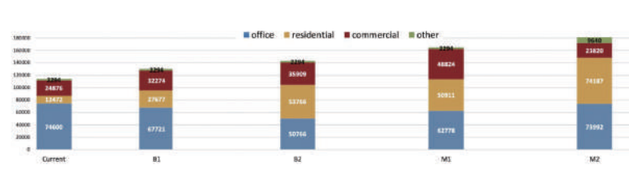
用途のマッピング｜Building Map Use

各シナリオの2050年時点での建物用途をプロットした。
The building uses at 2050 for each scenario are plotted.



用途別床面積｜Area of Each Building Use

各シナリオの2050年時点での用途別床面積を算出した。 The floor area by use is calculated for each scenario as of 2050



更新時期の設定｜Reconstruction Year Conditions

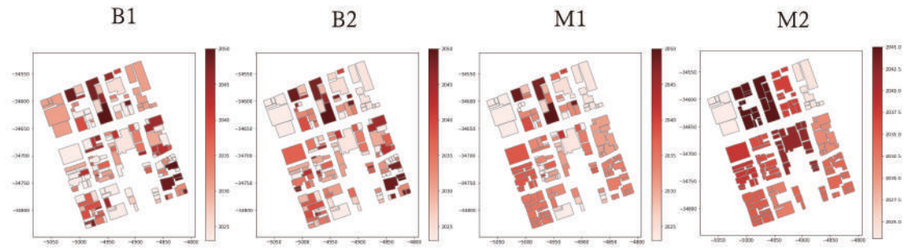
更新する建物の更新開始年を、築年数を基準に以下のように設定した。
The year of building renewal begin for each scenario is set as follows, based on the age of the building.

Means of renewal	Algorithm for determining the year of renewal for each building.			
	B1	B2	M1	M2
Redevelopment	Same as on the right	Same as on the right	Same as on the right	Average of building construction years per block (weighted by total floor area) + 50 years *However, those to be redeveloped before 2023 will be redeveloped in 2023 and those to be redeveloped after 2050 will be redeveloped in 2050.
Reconstruction	Building construction year + 50 years *However, those to be demolished before 2023 will be demolished in 2023 and those to be demolished after 2050 will be reconstructed in 2050.	Same as on the left	Same as on the left	
Renovation	Building construction year + 30 years *However, those to be renovated before 2023 will be renovated in 2023 and those to be renovated after 2050 will be renovated in 2050.	Same as on the left	Same as on the left	

建物取り壊し年｜Year of Building Removal (for Reconstruction or Redevelopment)

各シナリオの更新開始年を、遅いものが濃い赤色になるようにプロットした。

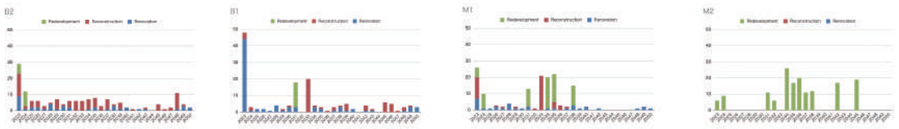
The year of building renewal begin for each scenario is colorcoded so that the later ones are darker red.



年別建替 / リノベ棟数｜Number of Buildings Reconstructed/Renovated by Year

各シナリオの更新建物数を年別に算出した。

The number of buildings renewed for each scenario is calculated by year.



賃料と二酸化炭素排出量の計算｜How to calculate Rent Price and CO2 emissions

賃料及び二酸化炭素排出量は、先行研究で示されている係数を各シナリオにおける延べ床面積に乗じることによって算出される。
賃料は住宅用途の場合は築年数に応じて、それ以外の場合は延べ床面積に応じて算出され、二酸化炭素排出量は各用途に応じて算出される。
なお、建替やリノベーションによって建物の環境性能が向上することを前提として、建替の際は0.6、リノベーションの際は0.9を乗じている。

Rent prices and carbon CO2 emissions are calculated by multiplying the coefficients. Rent prices are calculated based on the age of the building in the case of residential use, and based on the total floor area in other cases, while CO2 emissions are calculated for each type of use. Assuming that the environmental performance of the building will be improved by reconstruction or renovation, the amount is multiplied by 0.6 for reconstruction and 0.9 for renovation.

$$\text{Rent Price(JPY)} = \text{TFA} \times \text{factors}^{(*1)}$$

*1：shown below

For residential TFA	
Building age[year]	Rent Price[JPY/Tubo]
New (Age < 10)	17,500
Middle (10 <= Age < 20)	14,800
Old (20 < Age)	13,300
For ex residential TFA	
Building size[Tubo]	Rent Price[JPY/Tubo]
Super large (200 <= TFA_exR)	20,300
Large (100 <= TFA_exR < 200)	17,200
Middle (50 <= TFA_exR < 100)	15,200
Small (TFA_exR < 50)	12,900

$$\text{CO2 emissions(kg)} = (\text{Elec demand} + \text{Thermal lord}) \times \text{Emission factor}^{(*2)} \quad (*1)$$

*1；TFA × factors(shown below) × (0.6 if rebuilt, 0.9 if renovated)

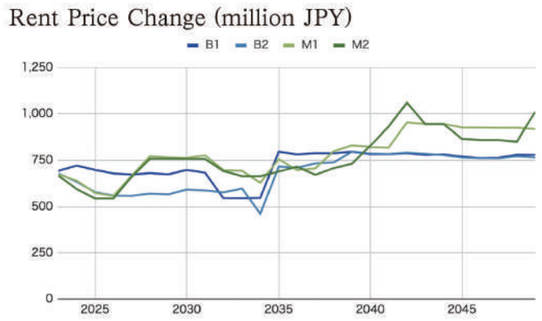
*2：0.2

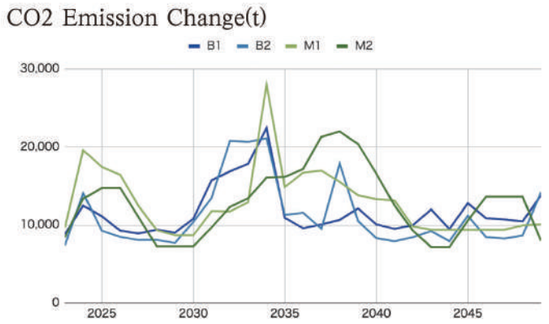
			Office(standard)	Office(w/OA)	Hospital	Hotel	Shop	Sports facility	Residence
Elec demand(kWh/m2y)			156	189	170	200	226	250	21
Thermal load	Hot water supply	(kWh/m2y)	2.6	2.1	93.0	93.0	26.7	1017.4	34.9
		(Mcal/m2y)	2.2	1.8	80	80	23	875	30
	Air conditioner (hotter)	(kWh/m2y)	36.0	68.6	86.0	93.0	40.7	94.2	23.3
		(Mcal/m2y)	31	59	74	80	35	81	20
	Air conditioner (cooler)	(kWh/m2y)	81.4	153.5	93.0	116.3	145.3	94.2	9.3
		(Mcal/m2y)	70	132	80	100	125	81	8

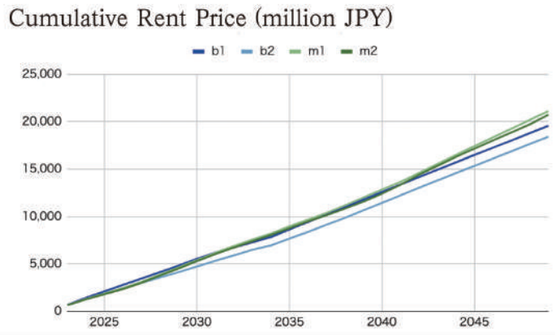
各シナリオごとに、賃料及び二酸化炭素排出量を算出し、二者及び賃料あたりの二酸化炭素排出量の年ごとの変動と累積値をグラフで表した。
なお、建替では２年間、再開発では５年間の工期を想定しており、その期間には賃料は0円、二酸化炭素排出量は別途延べ床面積に応じて決定される「建設に伴う排出量」として計算されている。

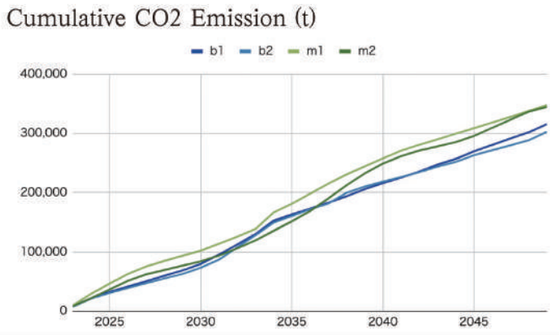
For each scenario, rent prices and CO2 emissions are calculated according to the above formulas, and the graph below shows the results of three calculations: rent prices, CO2 emissions, and CO2 emissions per unit of rent, as annual changes and cumulative values.
Note that the construction period is assumed to be two years for reconstruction and five years for redevelopment, during which time rents are zero and CO2 emissions are calculated as "construction emissions," determined separately based on the total floor area.

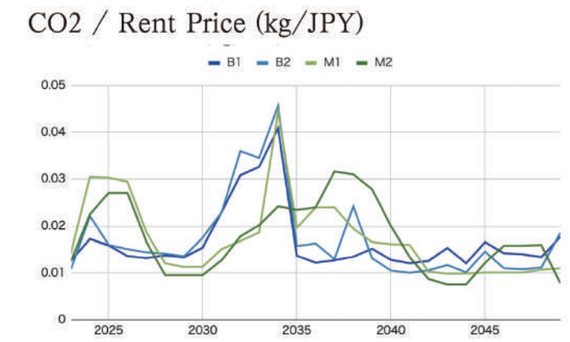
計算結果｜Results

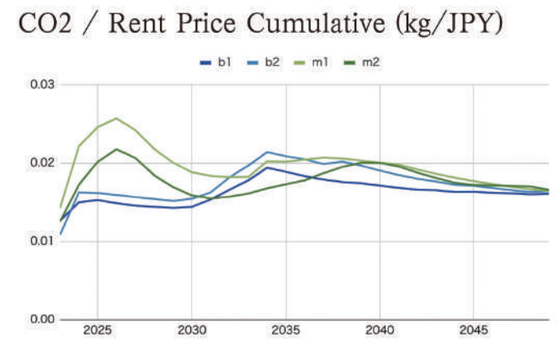












合計賃料あたりの合計 CO2 排出量をみると、大規模な再開発を行う M 型は建替・リノベを組み合わせる B 型シナリオよりも初期にかかるコストが大きい。
建替に伴う CO2 排出や、建替時期に賃料が入らないことも鑑みると、B 型のなかで比較すると B1 の方が経済・環境的に優れている（B1 の詳細をデザイン）
M 型の中で比較すると、２０５０年時点では M1 の方が経済・環境面で優れた案であるが、今後 M2 の賃料が高く安定することも踏まえると、長期的には M2 の方が経済・環境的に優れた案であると推察できる。（M2 の詳細をデザイン）

In terms of total CO2 emissions/rent, M scenarios, which involves largescale redevelopment, has higher initial costs than the B scenarios, which combines rebuilding and renovating. Taking into account the CO2 emissions associated with reconstruction and the fact that no rents are received during the reconstruction period, B1 is more economically and environmentally superior when compared within B scenarios. (B1' s detailed design will be introduced). When compared within M scenarios, M1 is the overall beeter than M2 in 2050, but taking into account that rents in M2 will be high and stable in the future, it can be inferred that M2 is the more economically and environmentally efficient in the long term. (M2' s detailed design will be introduced)

06 都市デザイン｜Urban Design

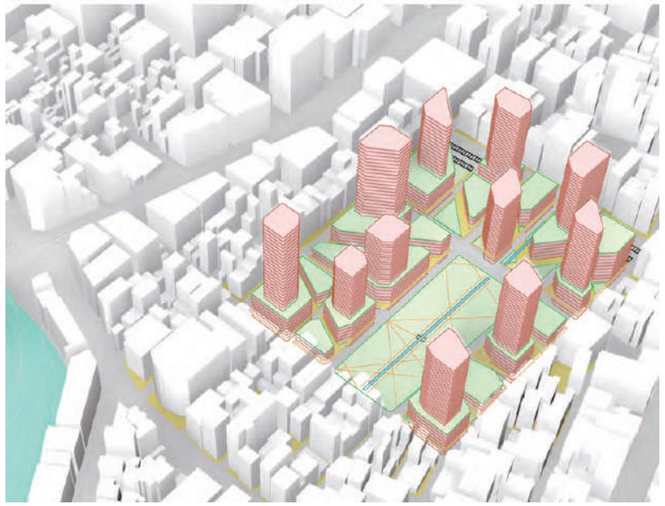
M案 High F.A.R｜

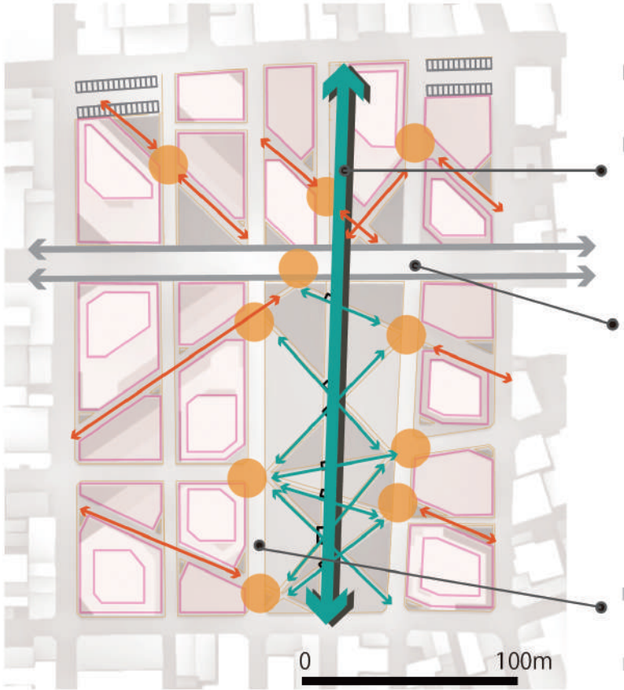
全街区で最大の開発を想定。（F.A.R 600%）

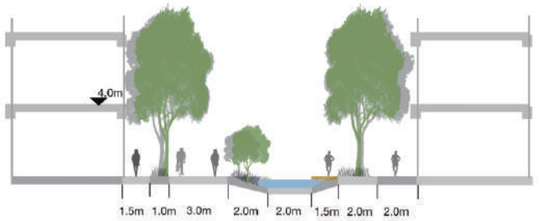
・南北方向のオープンスペース

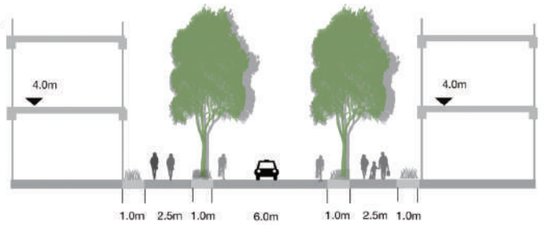
・建物基壇部の緑化により、緑地の多層化
・タワーをモザイク状に配置し、風の道を創出。
気候変動の影響を緩和・適応し、過ごしやすい街区とする。

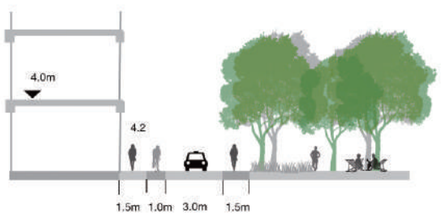
Development all blocks (F.A.R 600%).
Create more open space and multilayered green space through greening of the building plinths.
Creation of wind paths by arranging the towers.
This mitigate and adapt to the effects of climate change and make the area more pleasant to live in.











LEGEND
- Proposed Redevelopment
- Proposed Nord
- Path in Block
- Path in Park
- Existing path

Function

LEGEND
- Residense
- Office
- Commercial
- Hotel

Building height

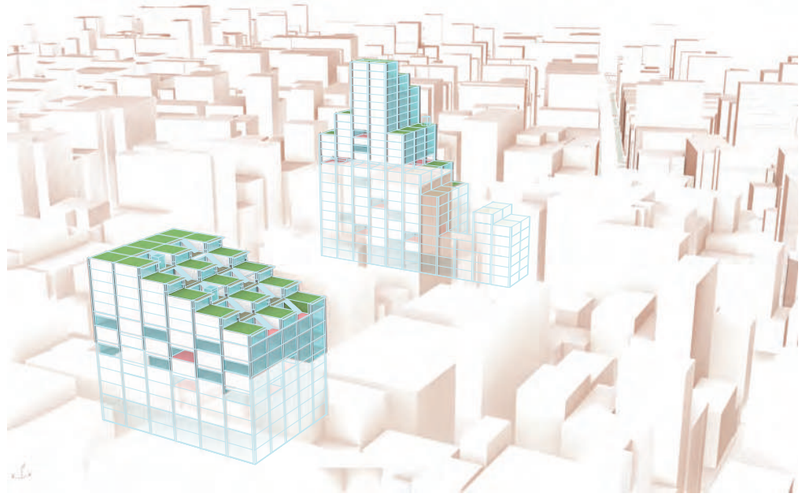
LEGEND
- ~20m
- 21-75m
- 76~100m
- 101~120m

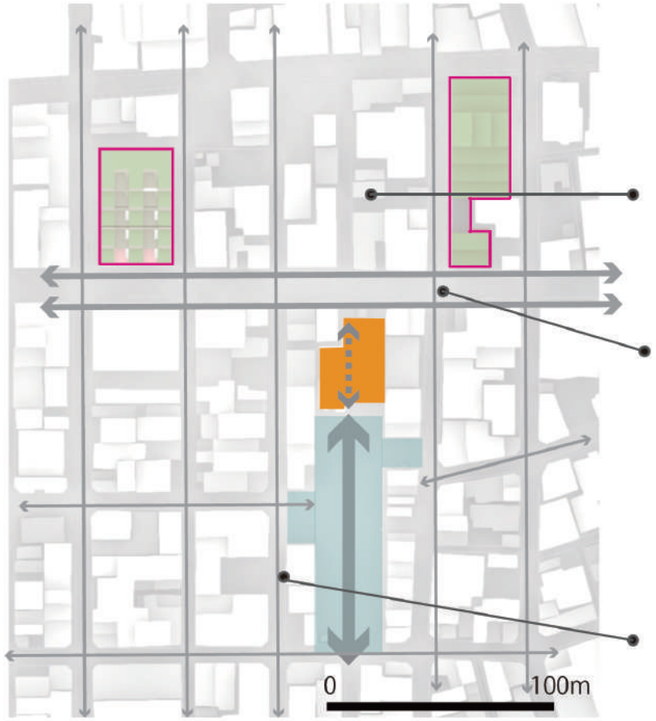
B案 Low F.A.R｜

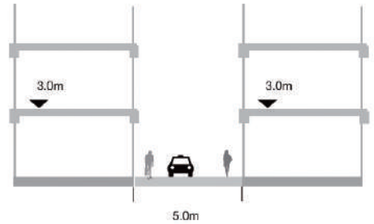
2 街区での再開発を想定
（F.A.R 600%）

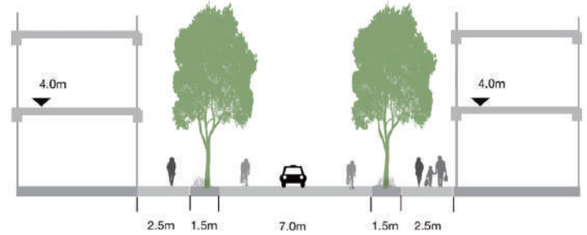
・太陽光を最大限に得るため、南面に向かって傾斜する形態とし、自然光を活用した低炭素戦略をはかる。

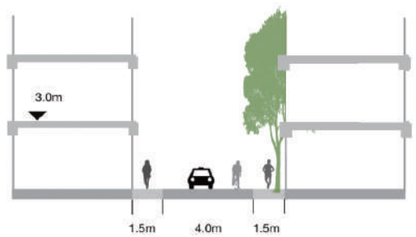
Development in 2 blocks (F.A.R 600%).
The buildings are sloped toward the south to maximize sunlight, which implement a lowcarbon strategy by utilising natural light.





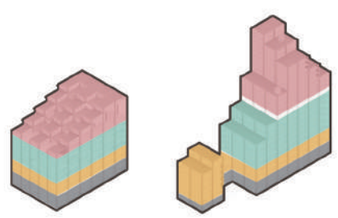






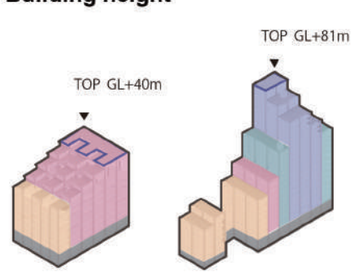
LEGEND
- Proposed Redevelopment
- Existing public facility
- Existing park
- Existing path

Function



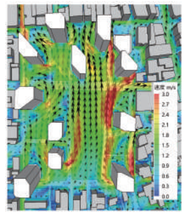
LEGEND
- Residense
- Office
- Commercial
- B.F Parking

Building height

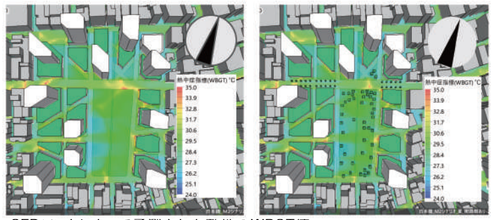


LEGEND
- B.F
- ~24m
- 25-40m
- 41~60m
- 61~81m

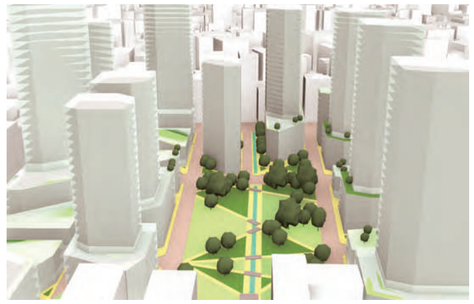
ビルをモザイク状に配置することで、風の道が創出されていることが確認できる。また WBGT 値を踏まえた植樹により、環境の改善が見られる。
By arranging the buildings in mosaic pattern, we confirm that the path of the wind is created.

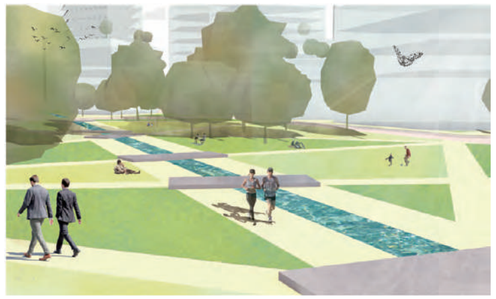


CFDソフトによって予測された敷地の風速
（気象庁の観測値を元に、南から3.0m/sの風が吹いている状況を仮定）
Wind speeds at the site predicted by CFD software

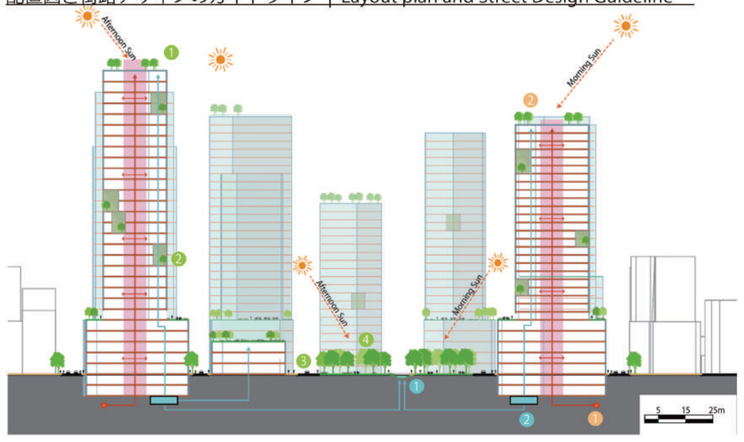


CFDソフトによって予測された敷地のWBGT値
左：特に植樹を施さなかった場合　右：一部に植樹を施した場合
WBGT at the site predicted by CFD software.





配置図と街路デザインのガイドライン｜Layout plan and Street Design Guideline



LANDSCAPE STRATEGIES
1. Roof gardens
2. Green gaps inside the buildings
3. Green corridors for pedestrians
4. Redesign the park

WATER MANAGEMENT
1. Artificial water system as the axis of the park
2. Set underground impounding reservoirs to support water use

ENERGY STRATEGIES
1. Energy center to support energy use inside the buildings
2. Collect solar energy to support energy center

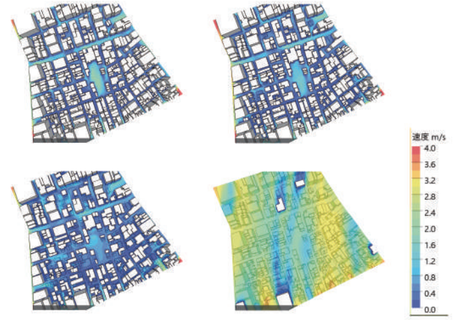
評価｜Assessment

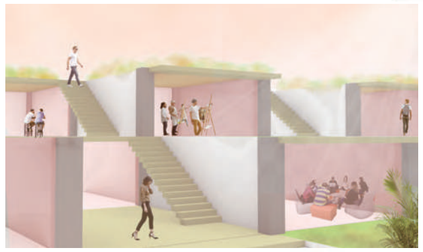
SOCIAL	ENVIRONMENTAL	ECONOMIC
・人口（床面積に対する収容可能人数） 住民　2968 人（+495%） 従業員　3700 人（-1%） ・歩きやすい街路空間の形成 Population: 3,700 residents, 2,968 employees, Creation of walk-friendly street spaces	・日本橋川の河川水を活用したエアコン ・緑地の整備による生態系サービスの活用 ・ビル風・影による涼しい環境の創出 'Air conditioner' using river water from river, Utilization of ecosystem by developing green spaces, Creation of cool environment	・賃料は大幅に上がる（+70%）不確実性あり ・人口が増え、周辺での経済効果が高まる。 ＊つくるための初期投資が必要 Rise in rent prices.Population increases, and the economic effect in the surrounding area increases.

メリット：地区が高密度となり、長期的な視点で見た賃料の増大が見込める。
Strength: The district will become denser, and rent prices are expected to increase over the long term.

デメリット：開発をする上での初期投資が大きく、リスクが高い。
Weakness: The initial investment for development is large and high-risk.

よって2050 年までの短期的な視点で見れば、M 案のような大規模開発は CO2 経済効率が悪いと言える。
From a short-term perspective up to 2050, it can be said that large-scale development such as Plan M has poor CO2 economic efficiency.



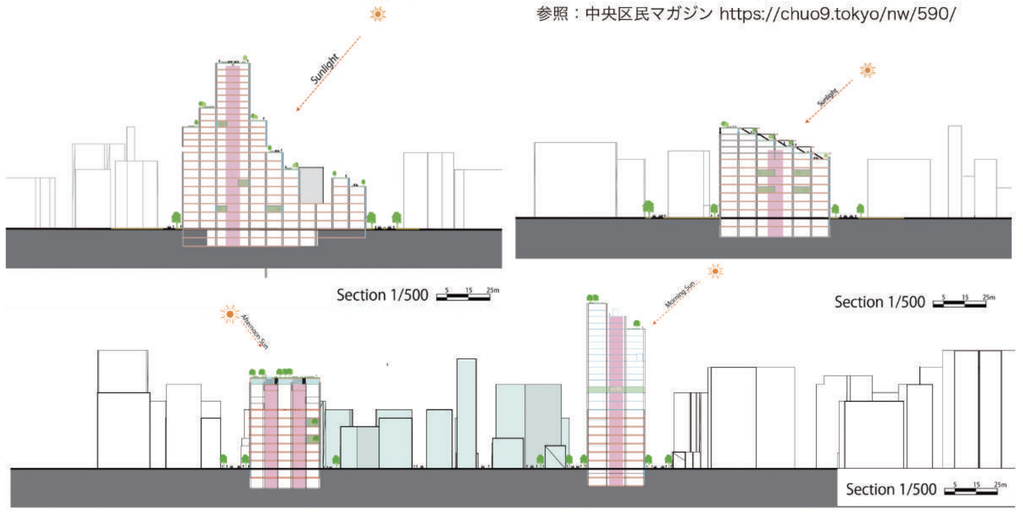


他のシナリオにおける CFD 解析結果との比較から、

・通りに面する建物の高さを揃える
・フットプリントを細くする
ことが、夏における地上付近の風速を高める上で有効だと分かり、計画に反映した。
その結果、再開発した 2 ヶ所において周辺の風速が微増した。

The wind speed around the two redeveloped sites slightly increased.

堀留児童公園の改修（進行中）
参照：中央区民マガジン https://chuo9.tokyo/nw/590/



評価｜Assessment

SOCIAL	ENVIRONMENTAL	ECONOMIC
・人口（床面積に対する収容可能人数） 住民　1106 人（+121%） 従業員　3619 人（-3%） ・周辺における既存景観の保全 Population: 2544 residents, 2146 employees, Conservation on existing sceneries	・自然光を活用した照明・エアコン ・東西の通りに面する建物の高さを揃え、風が通りやすくする Utilization of natural sunlight for lighting, Alignment on the heights of the buildings facing streets to make it easier for wind to pass through.	・住宅の供給量が増える、賃料が微増 The supply of housing and the rent prices will increase.

メリット：投資のリスクが低い。（地区の現状に近いため、小さな投資を繰り返せば良い）
Strength: The initial investement costs least for low-risk.

デメリット：2050 年以降も検討に加えれば、大規模開発に比べた際の CO2 経済効率が悪い。
Weakness: Considering the period beyond 2050, economic efficiency is worser.

いずれにせよ、日本橋東地区の開発案を検討する上では、本地区の役割をより広域視点で考える必要があるだろう。
In any case, when considering development plans for the Nihombashi East area, it will be necessary to consider the role of this area from a broader perspective.