



DUBAI WORLD CONGRESS
FOR SELF-DRIVING TRANSPORT

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AV City: Case Studies in De-parking San Francisco

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automobile \leftrightarrow architecture & urban design



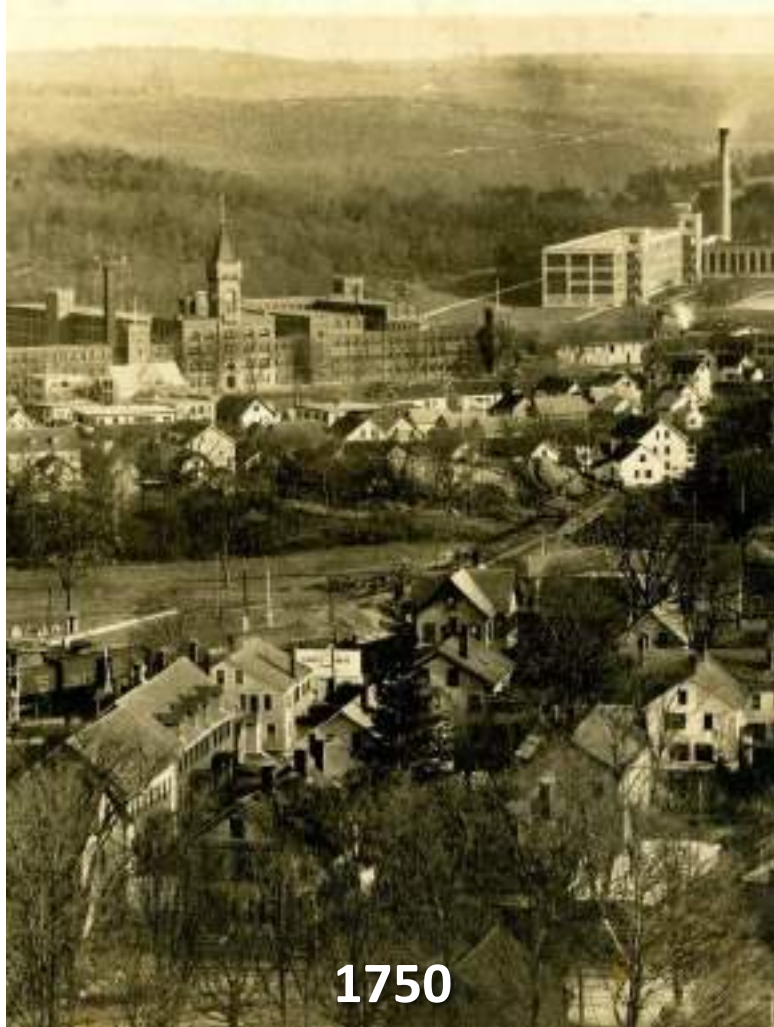
San Francisco as Petri dish



100 year cycle of transportation...



... with profound effects on urbanization



urban design ↔ autonomous vehicles



architecture + automobile = city



Norman Bel Geddes: "Futurama:" General Motors Pavilion, World's Fair 1939



maximizing envelope



Hugh Ferris: Studies for Maximum Mass Permitted by the 1916 New York Zoning Law, 1922

parking drosscapes...

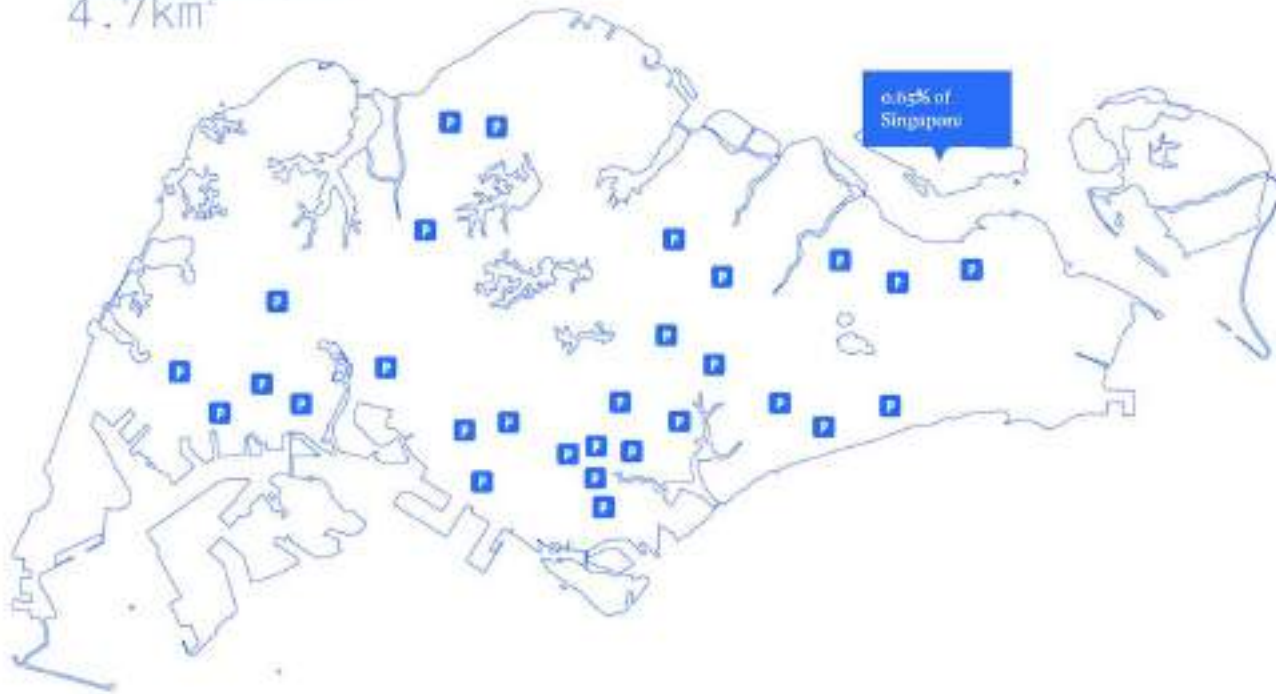


maximizing parking through automation



unparking ...

Tomorrow's
The Area of Total Parking Spots is
4.7km²



Today in Singapore

**Private Cars,
No Sharing Parking.**

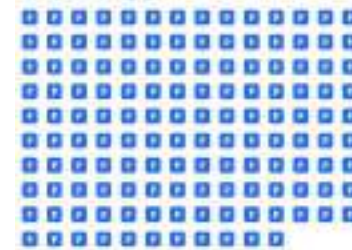
Each person has a private car and has a private reserved parking spot at their home and work location.

Number of Cars



676,000

Total Number of Parking Spots



1,370,000

Tomorrow in Singapore

**Self-Driving Vehicles
Sharing Parking Lots.**

Shared cars are capable of self-driving, share their own pool of space with all passengers on their own time and work location and their own in a public parking spot.

Number of Cars



200,000 (-70% (600k - 700k))

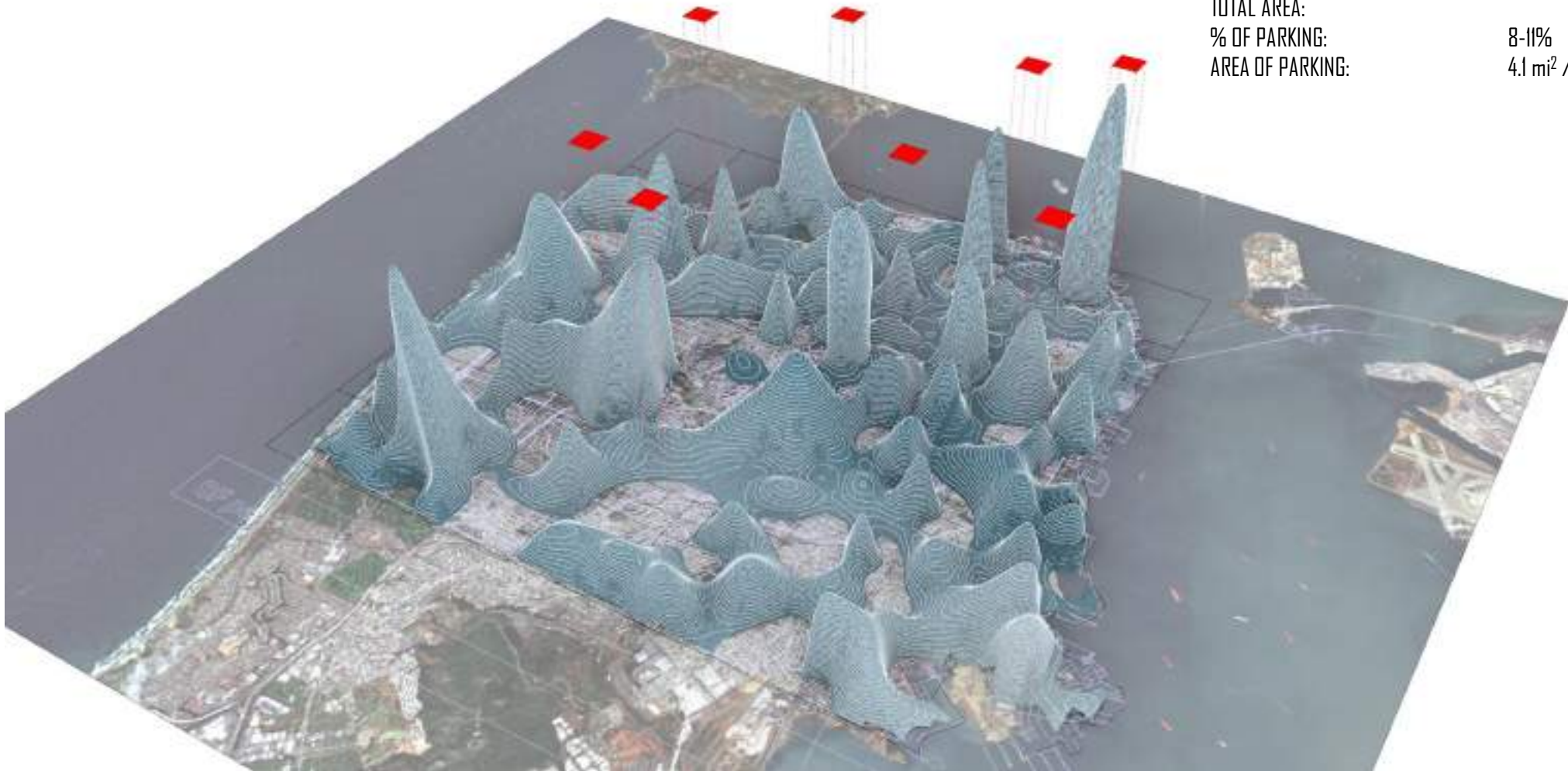
Total Number of Parking Spots



410,000 (-40% (600k - 700k))

Image credit: "Unparking." MIT Sensable City Lab, 2017

redistributing SF's parking landscape



CITY OF SAN FRANCISCO

TOTAL AREA:

49 mi² / 11.25 km²

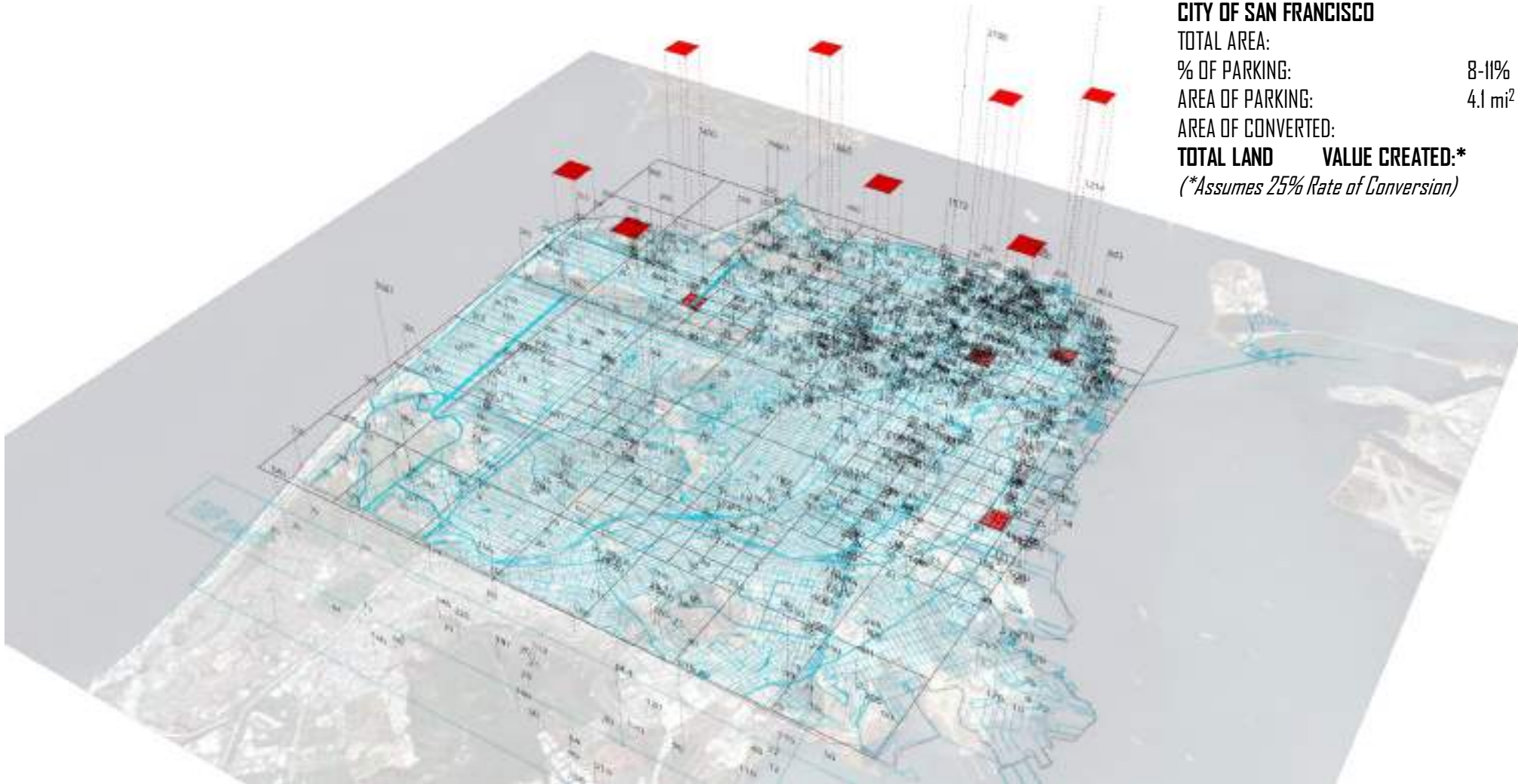
% OF PARKING:

8-11%

AREA OF PARKING:

4.1 mi² / 1.0 km²

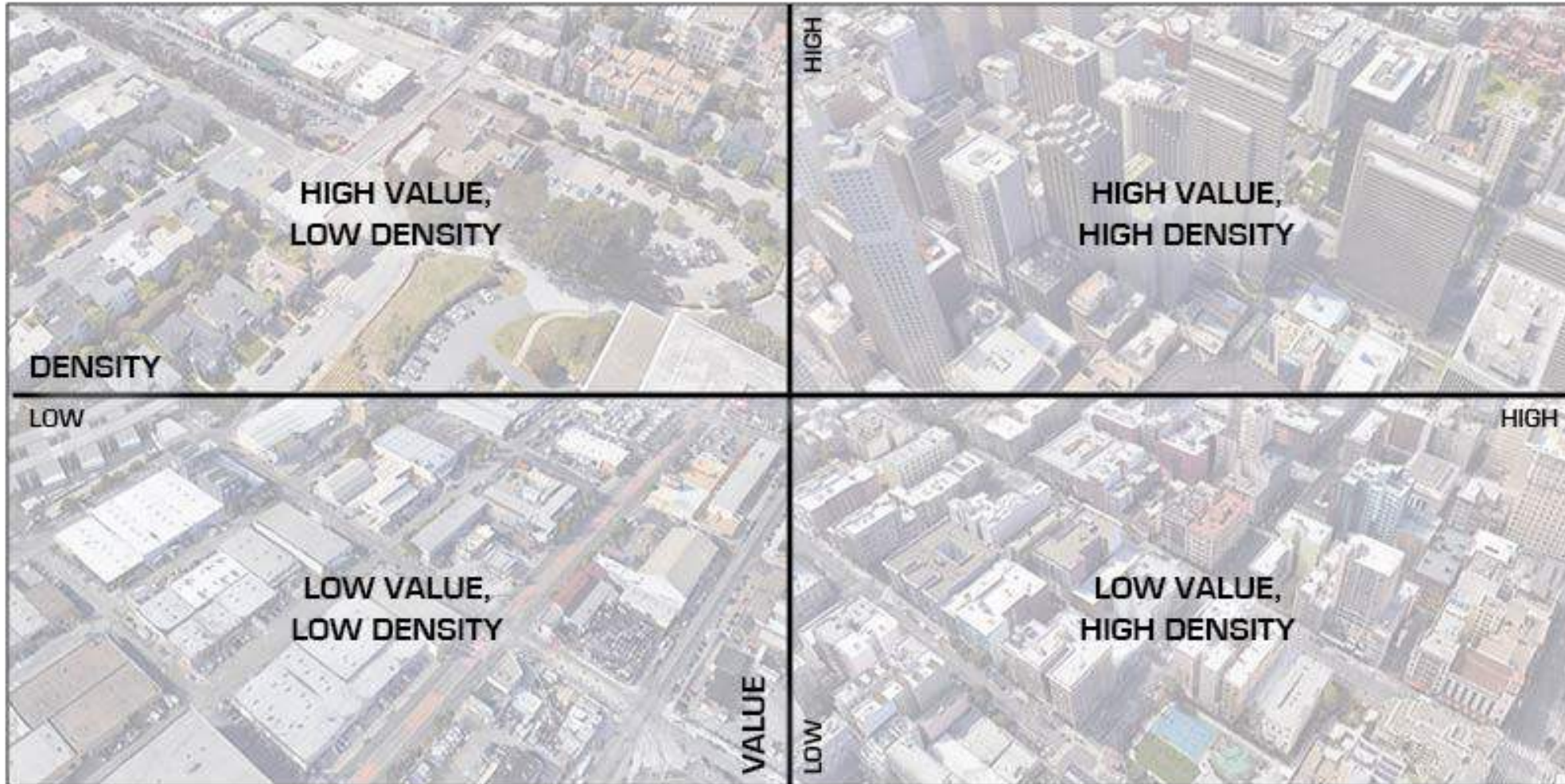
San Francisco: creating ancillary value



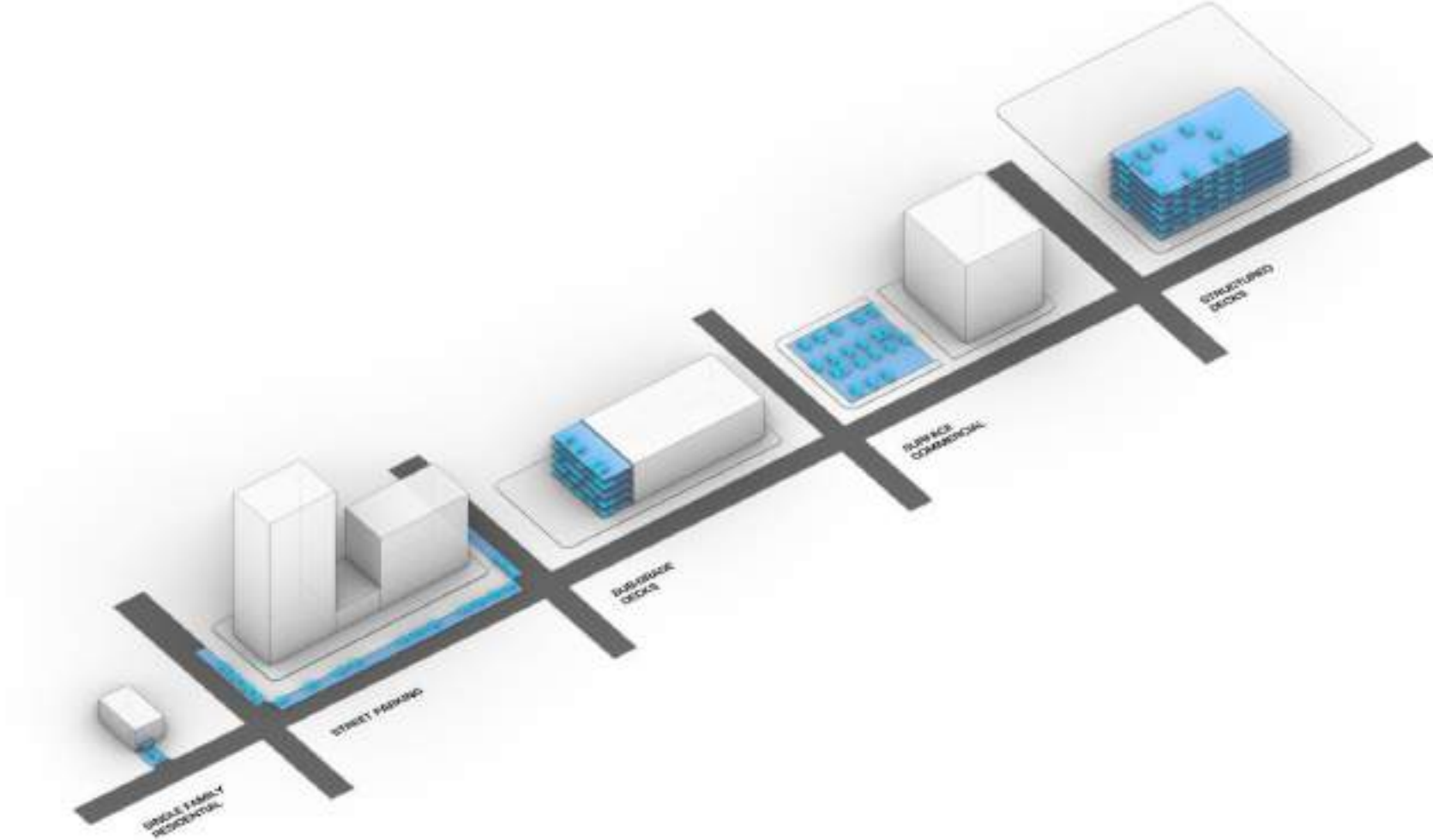
CITY OF SAN FRANCISCO

TOTAL AREA:		49 mi ² / 11.25 km ²
% OF PARKING:	8-11%	
AREA OF PARKING:	4.1 mi ² / 1.0 km ²	
AREA OF CONVERTED:		42-51m square feet
TOTAL LAND	VALUE CREATED:*	\$4.3-5.1 bn
<i>(*Assumes 25% Rate of Conversion)</i>		

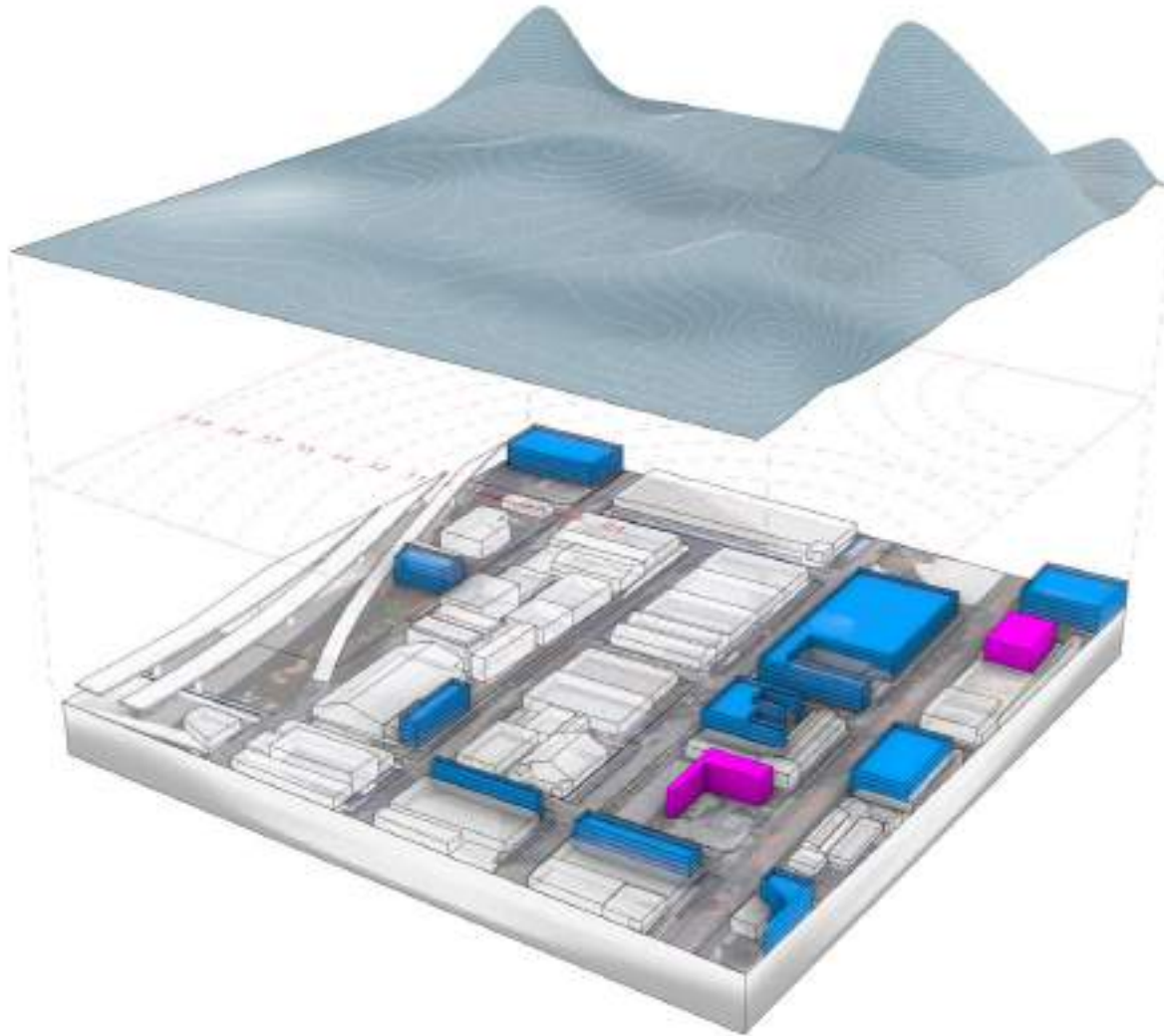
variables: density x land value x parking



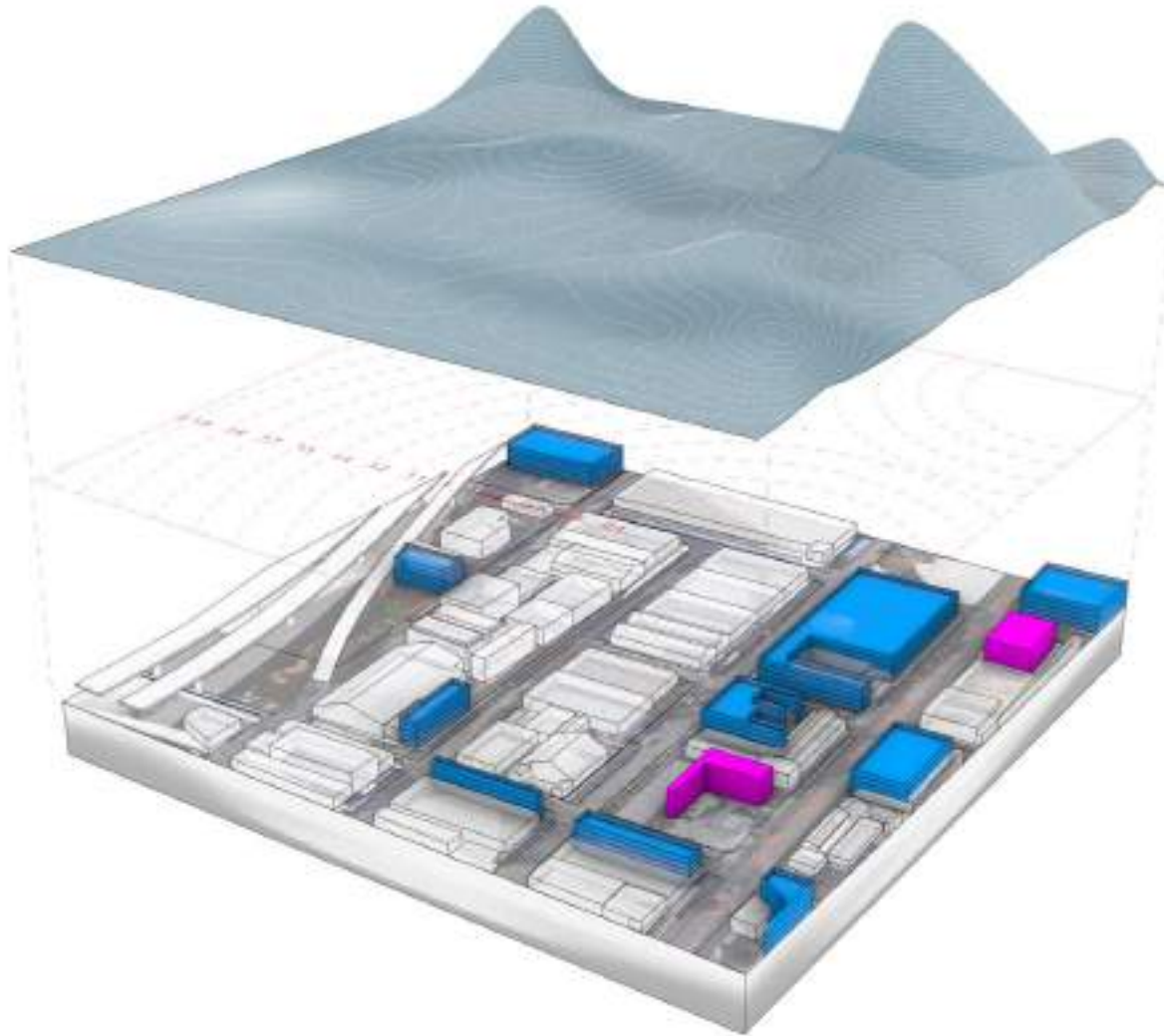
conversion types



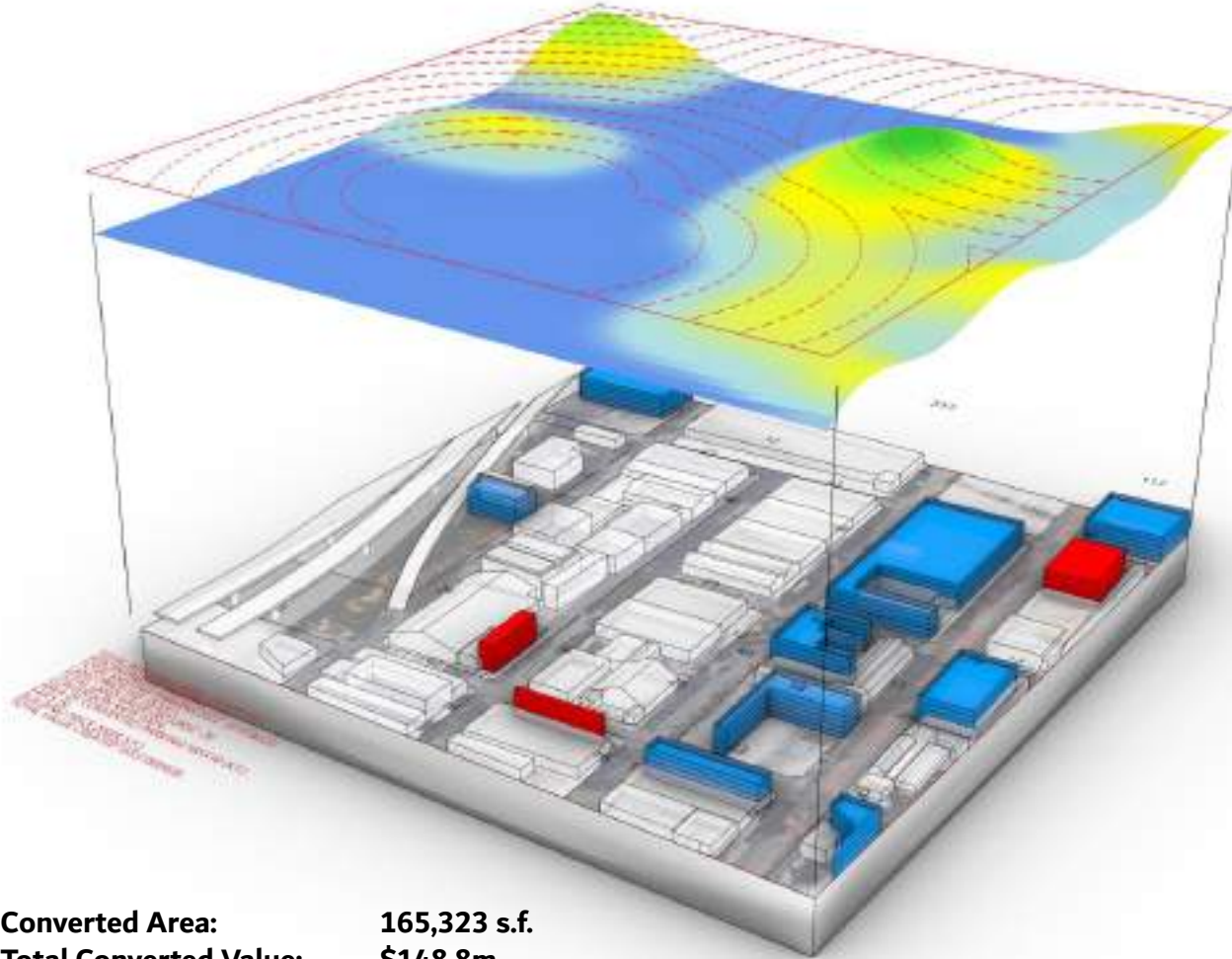
testing conversion strategies



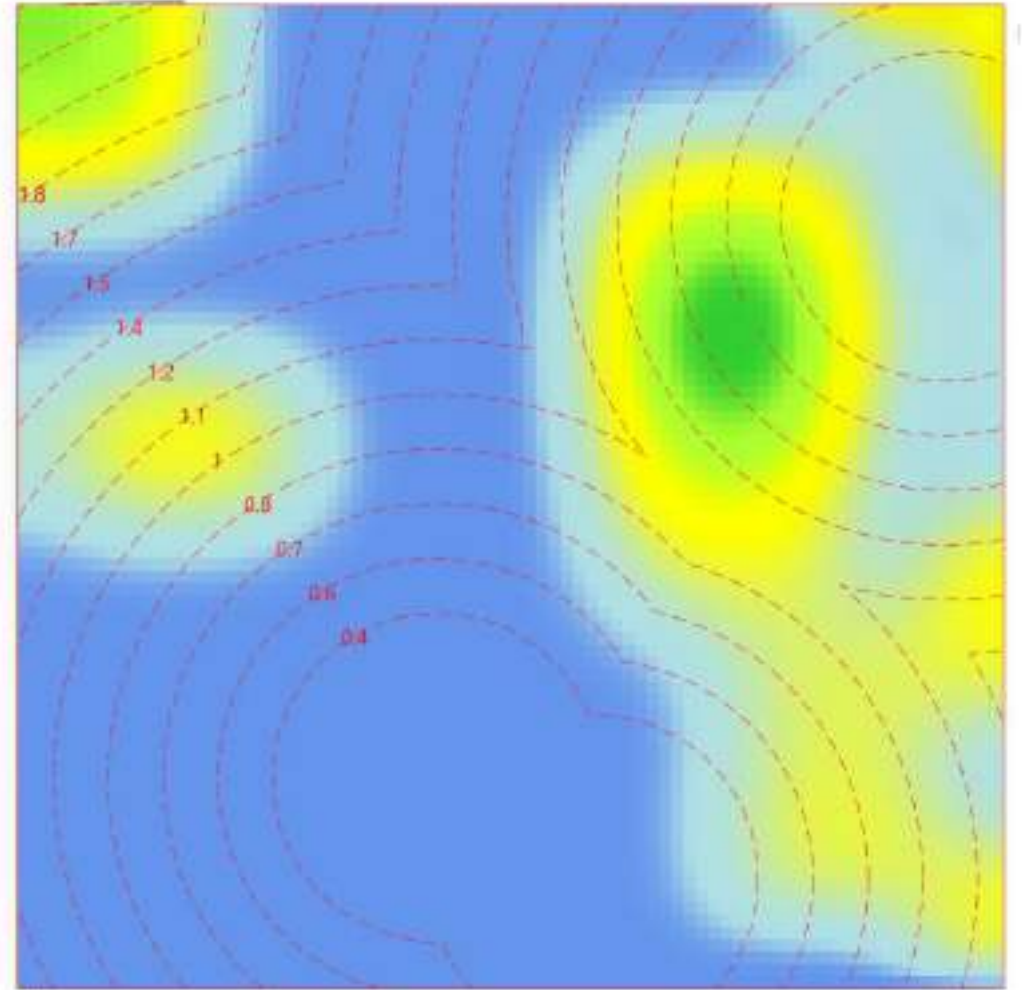
convenience = value



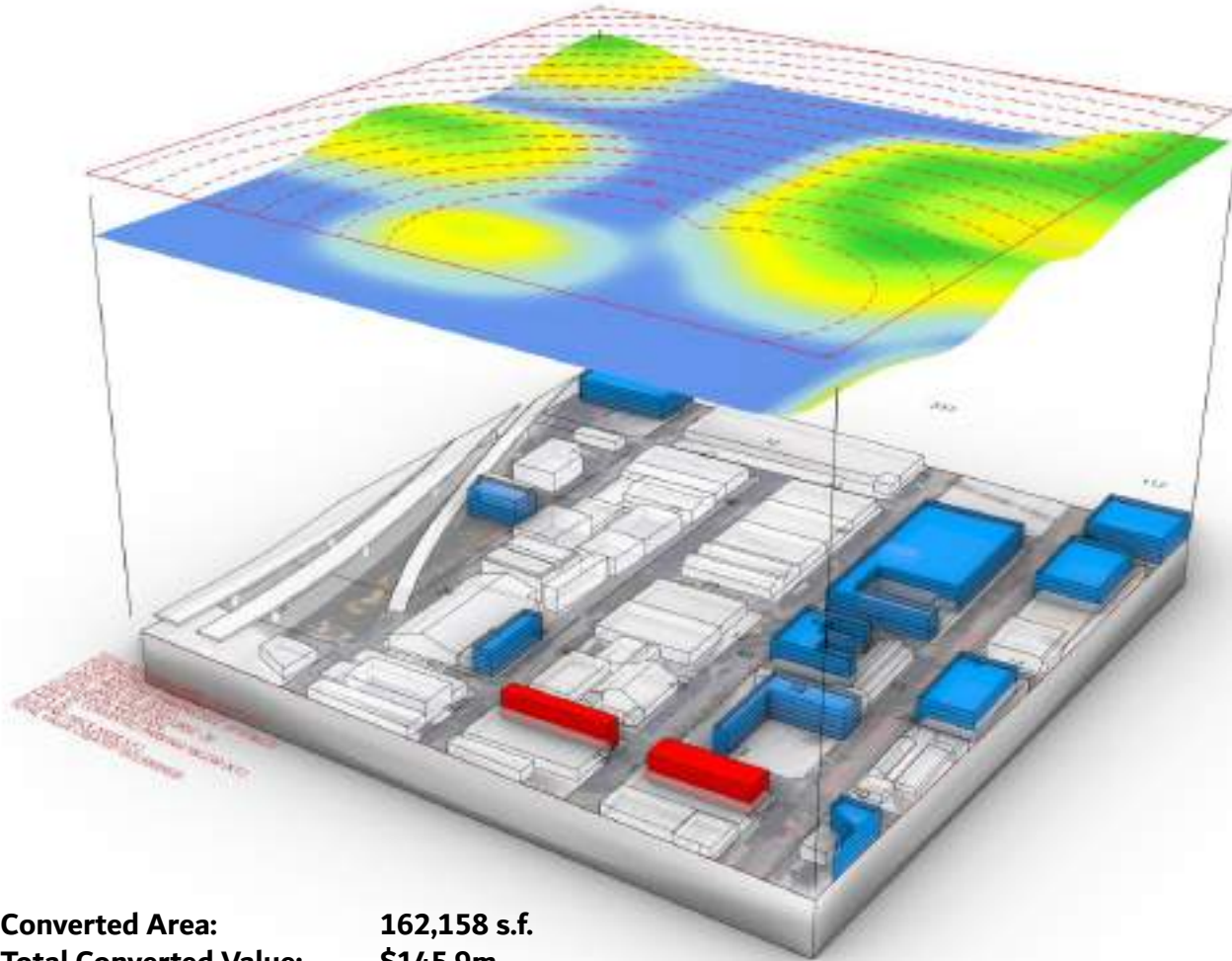
optimizing value x coverage



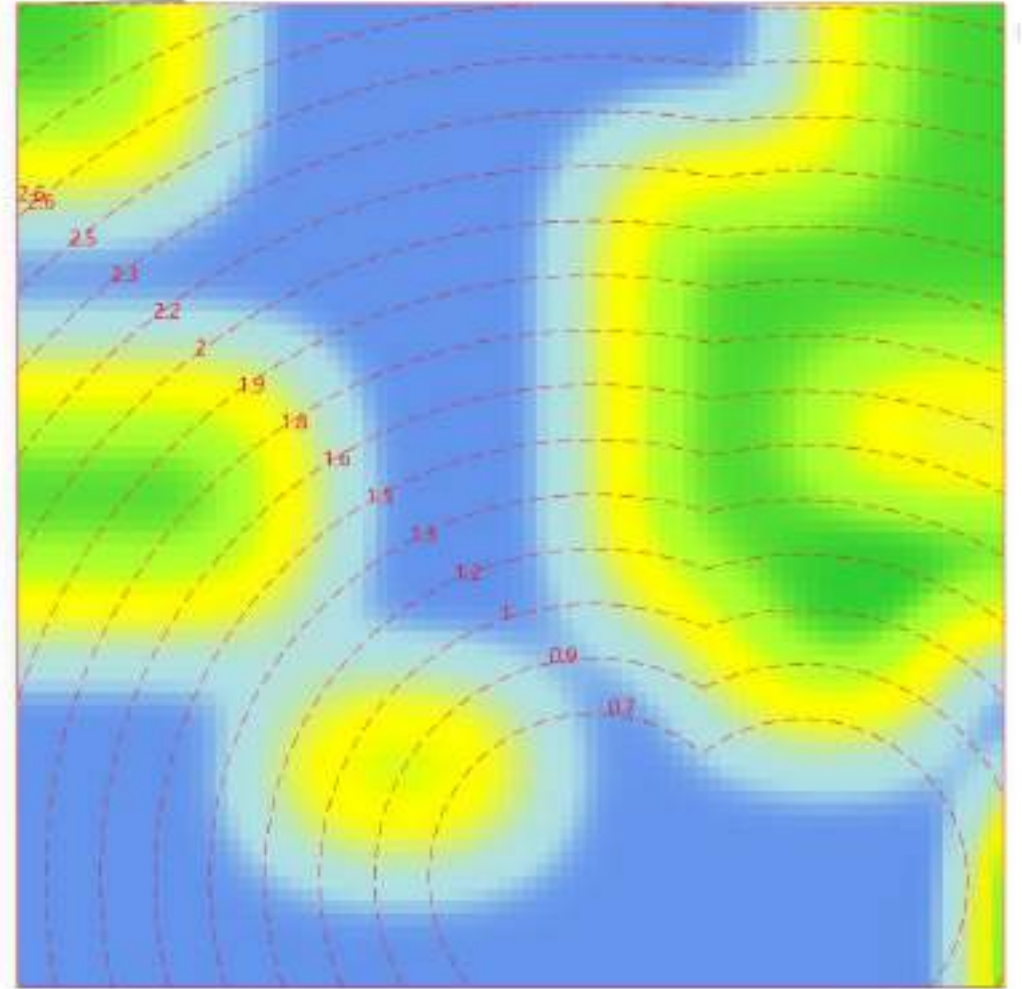
Converted Area: 165,323 s.f.
Total Converted Value: \$148.8m



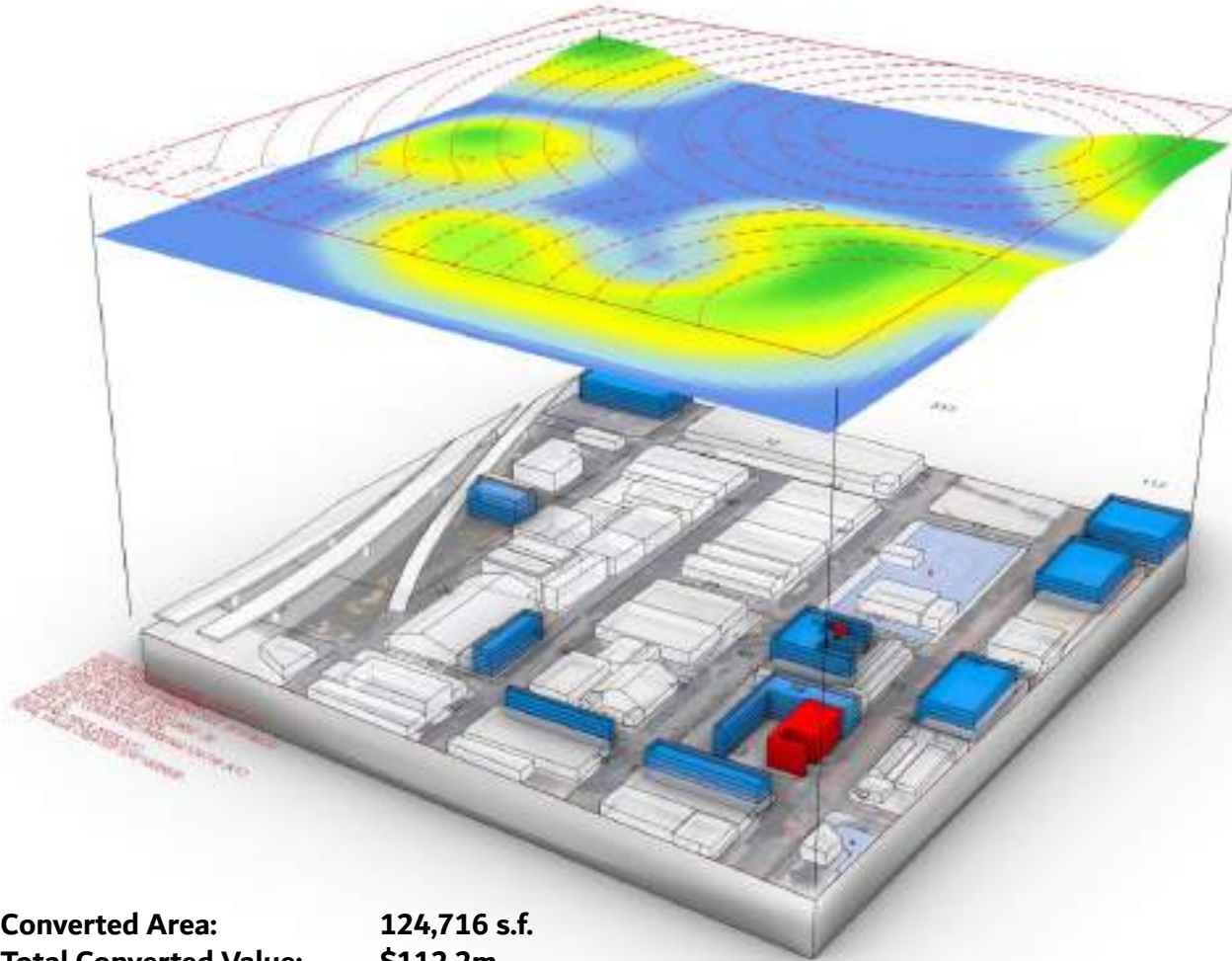
optimizing value x coverage



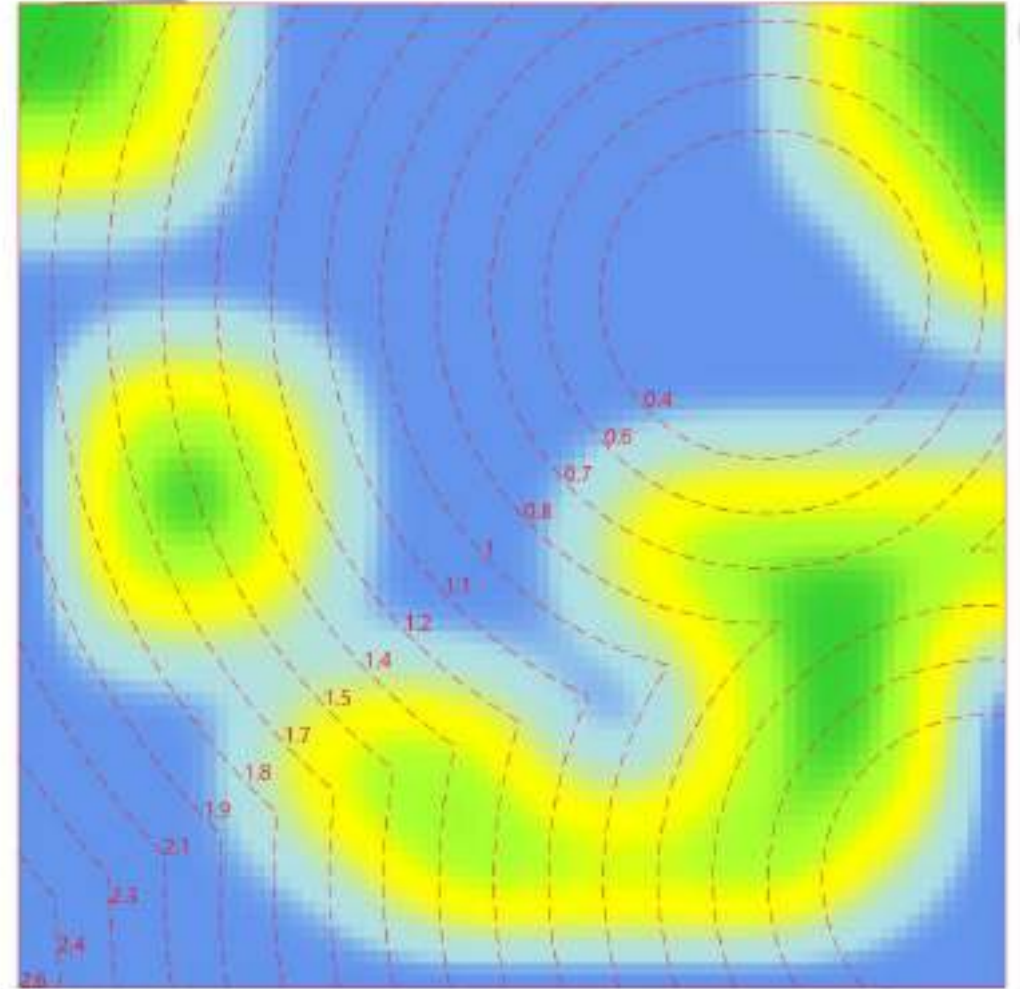
Converted Area: 162,158 s.f.
Total Converted Value: \$145.9m



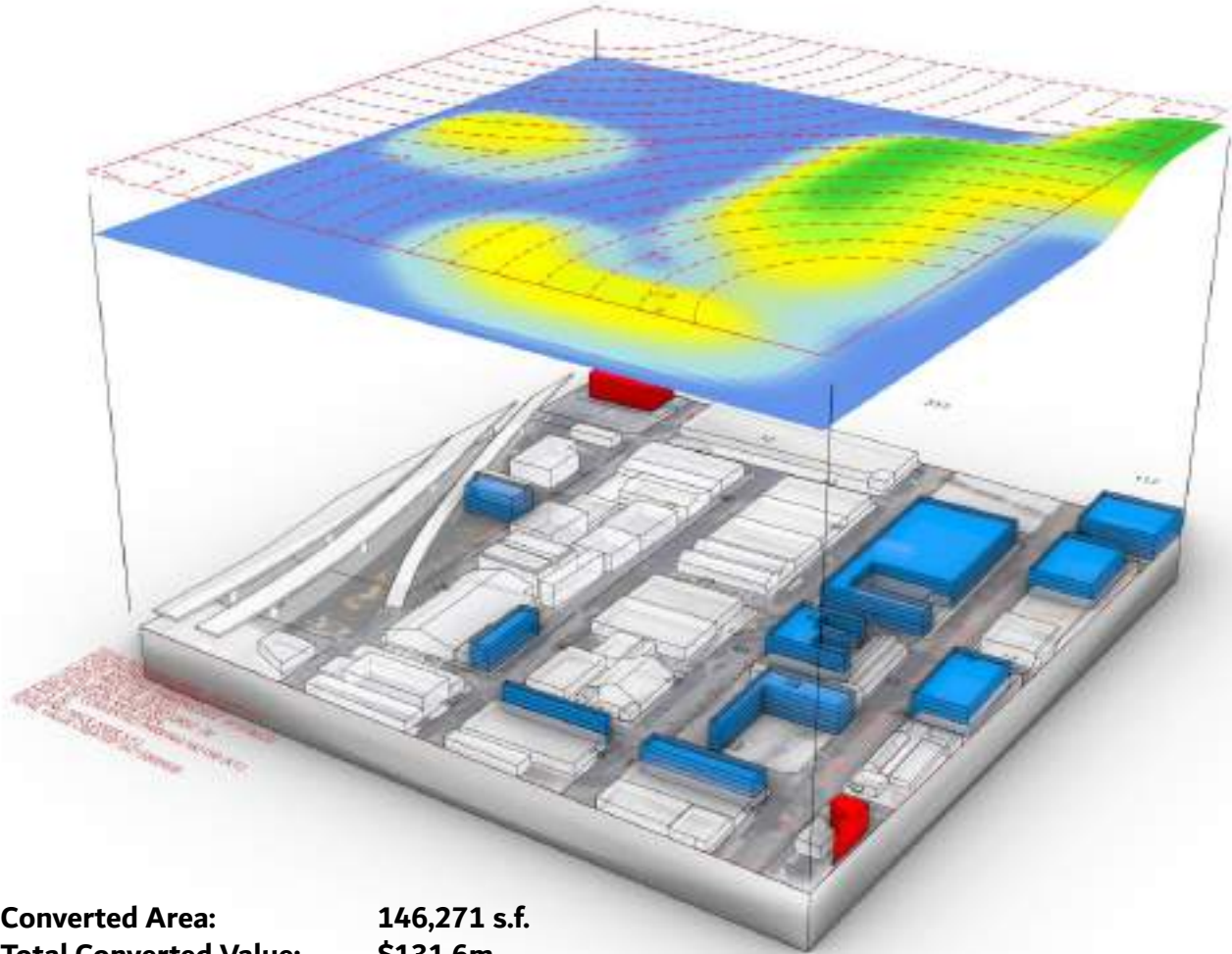
optimizing value x coverage



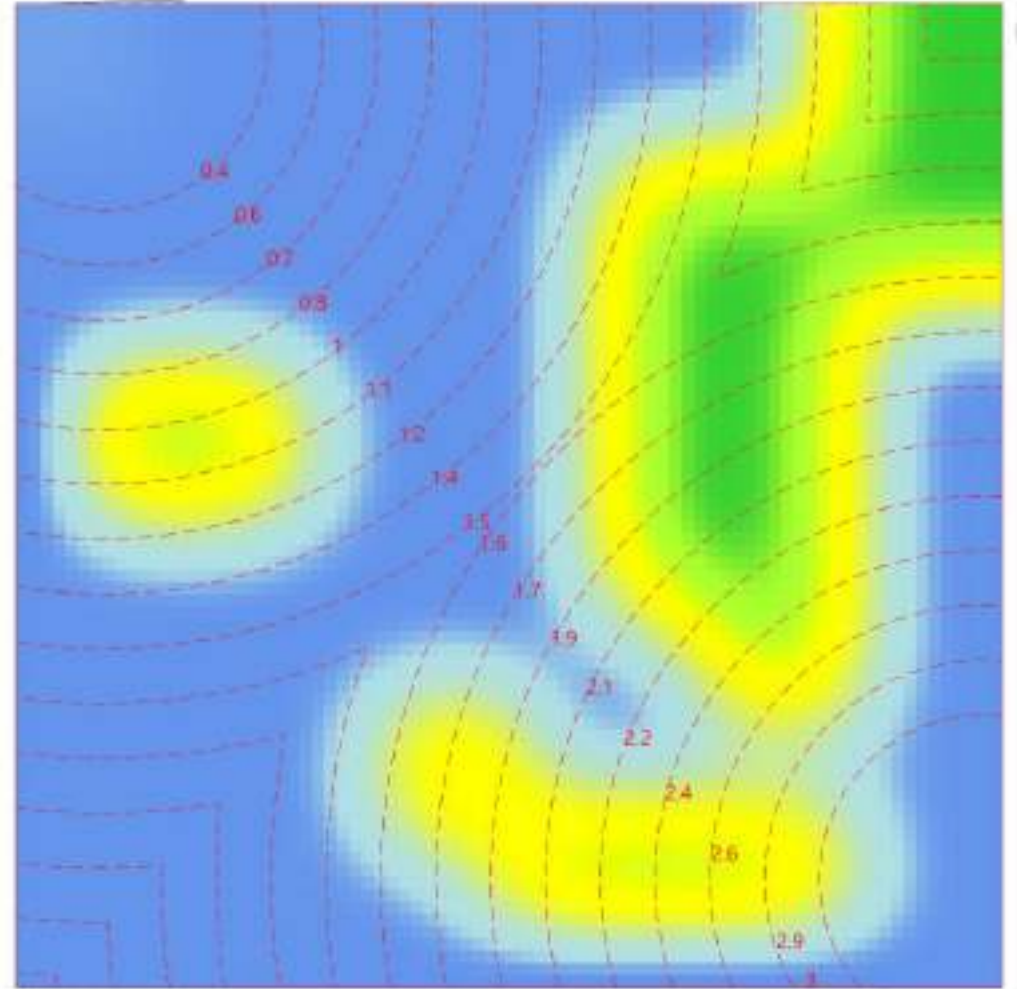
Converted Area: 124,716 s.f.
Total Converted Value: \$112.2m



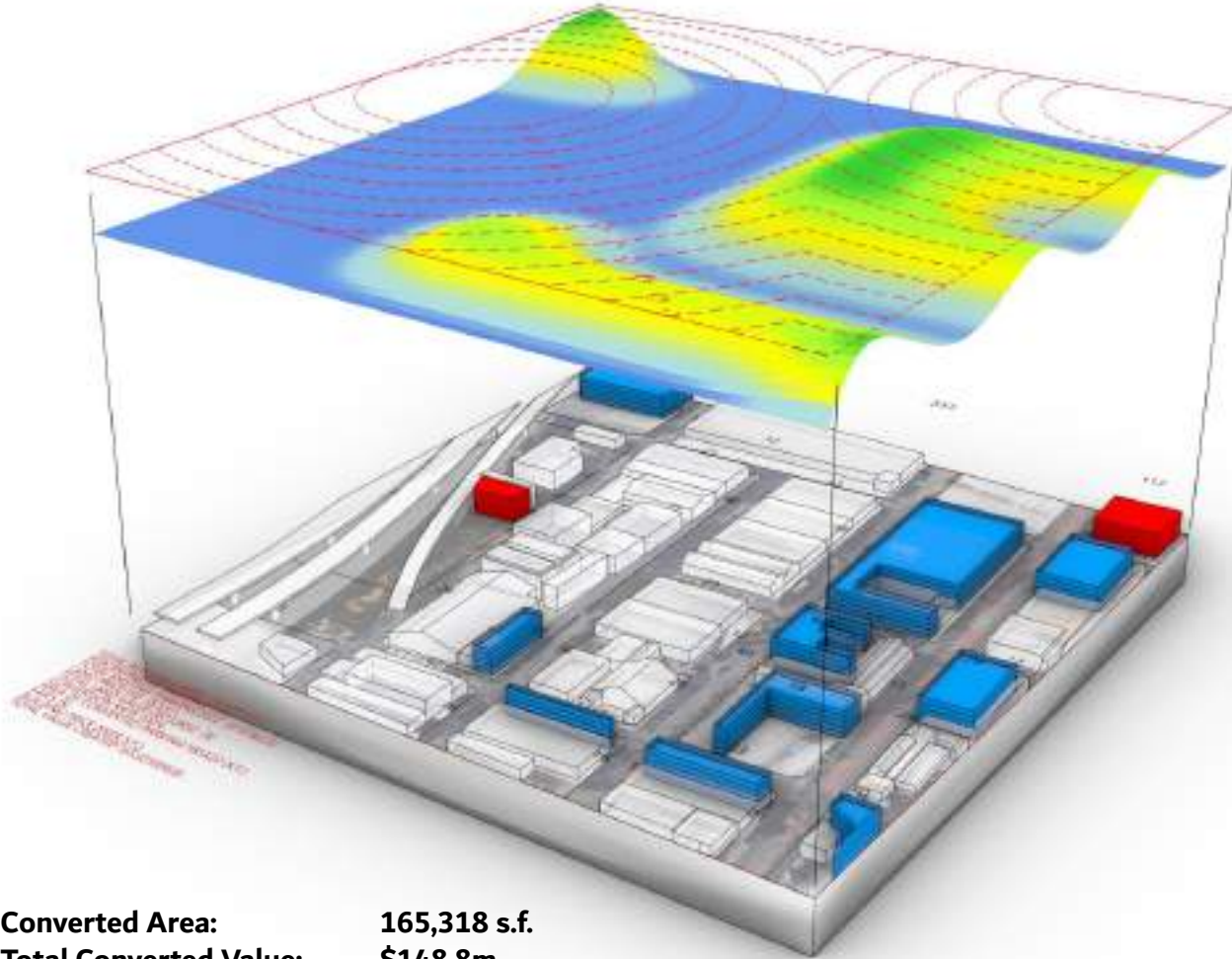
optimizing value x coverage



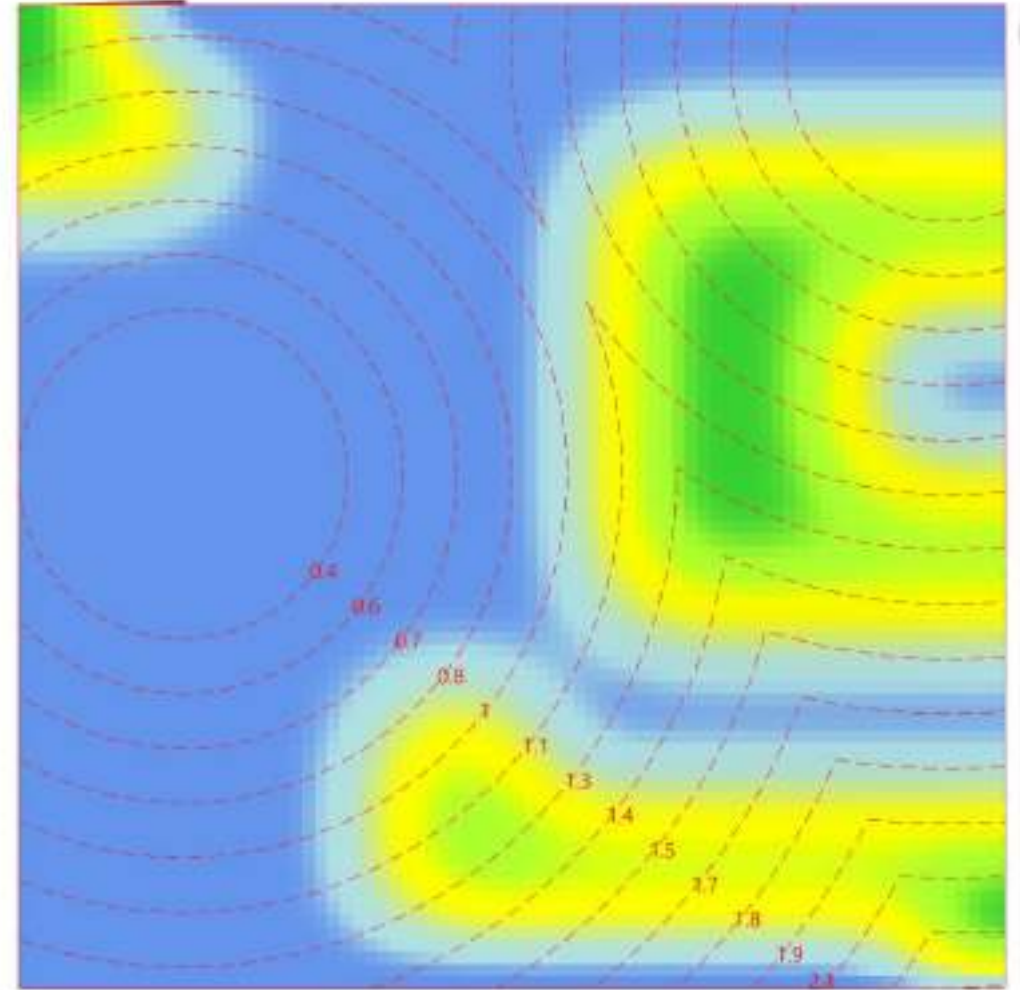
Converted Area: 146,271 s.f.
Total Converted Value: \$131.6m



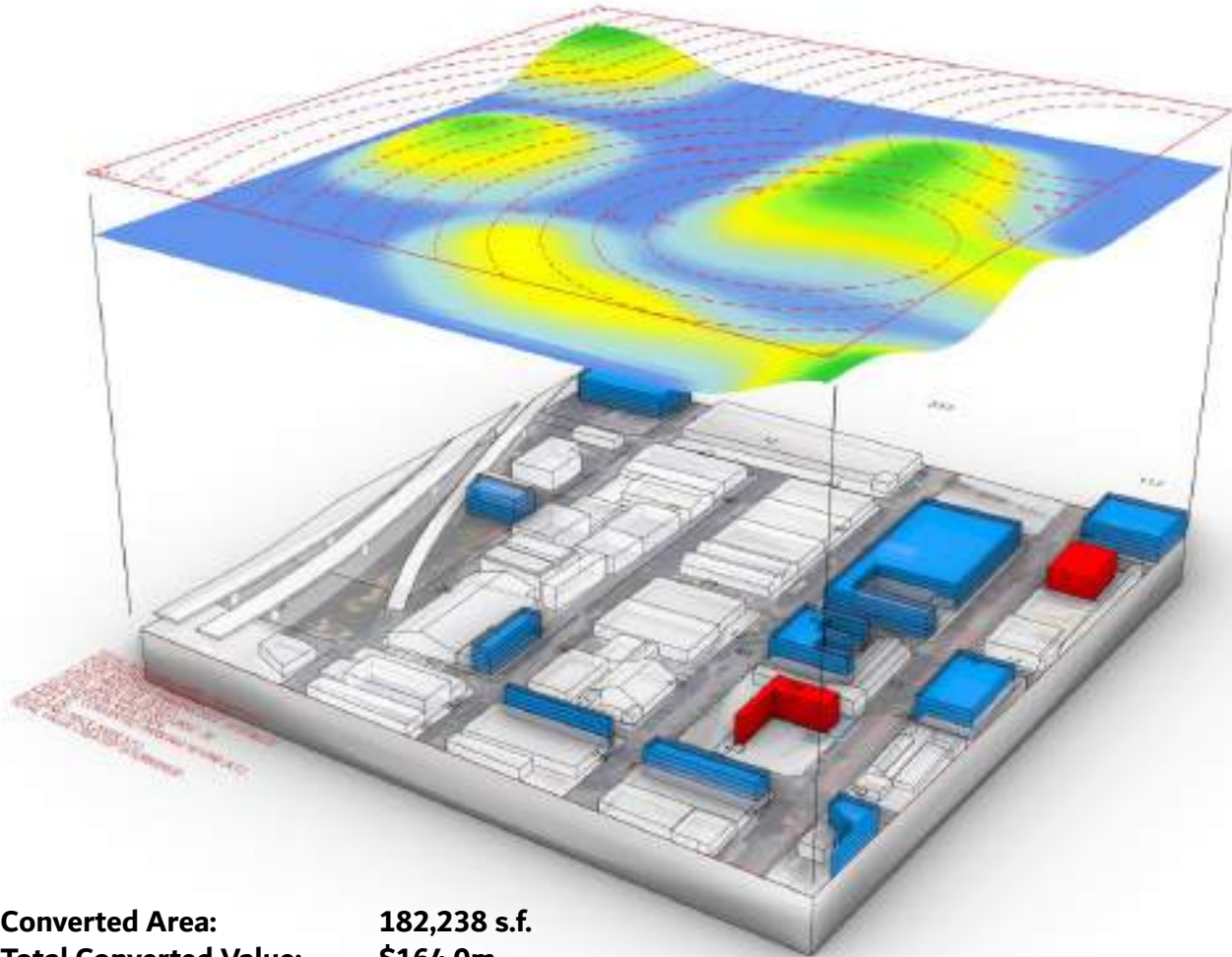
optimizing value x coverage



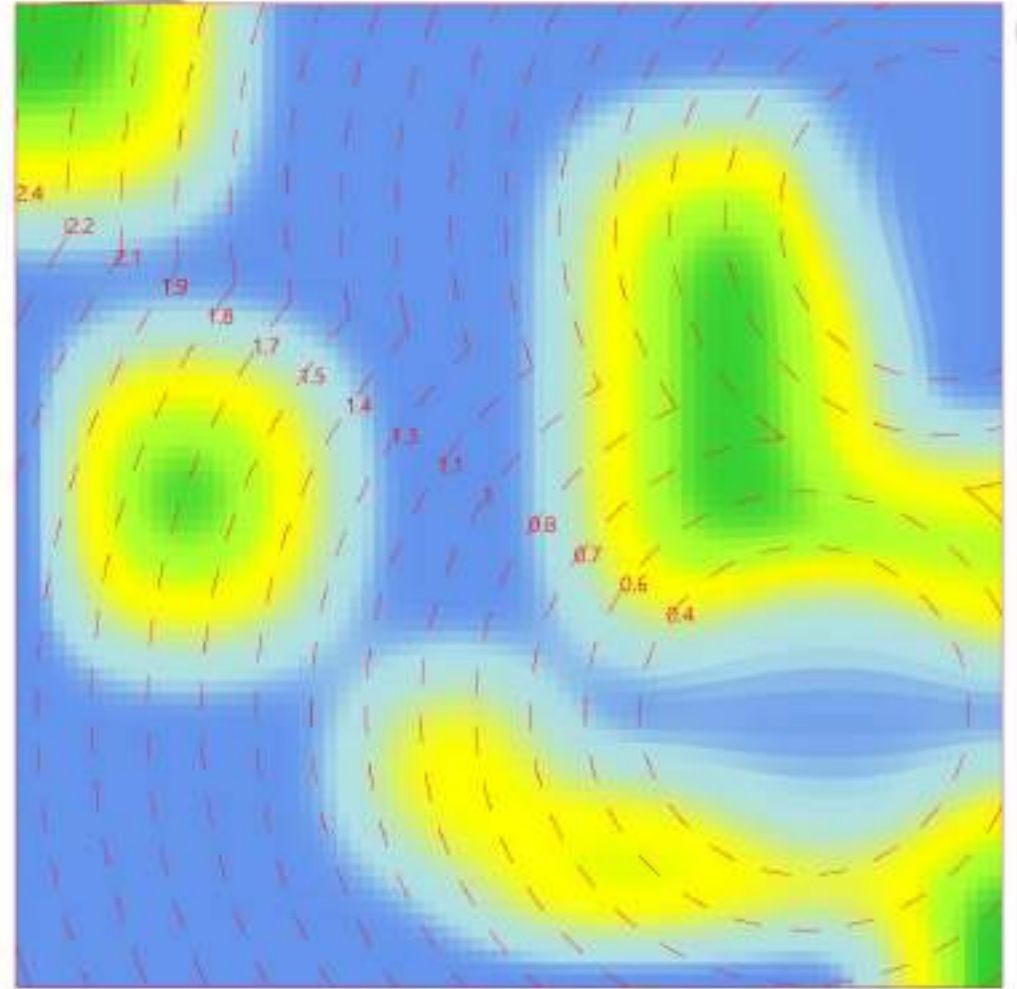
Converted Area: 165,318 s.f.
Total Converted Value: \$148.8m



“optimization” & amplifying value



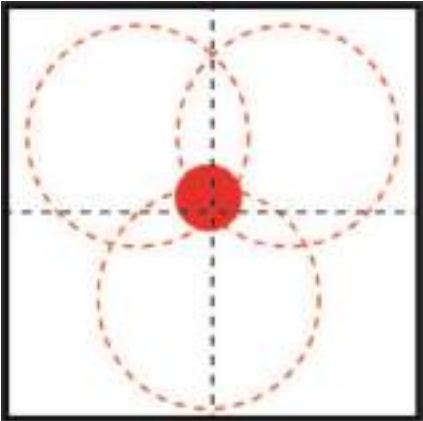
Converted Area: 182,238 s.f.
Total Converted Value: \$164.0m



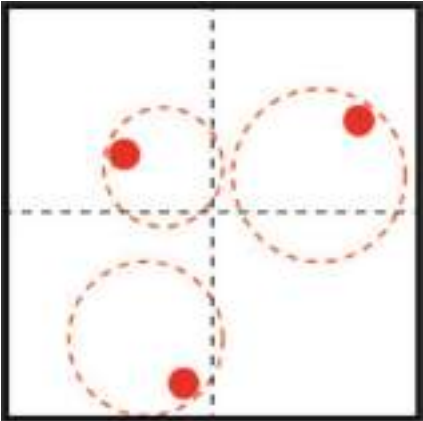
distribution strategy

HIGH VALUE / LOW DENSITY (Laurel Village)

Centralize at nexus of largest/key conversion areas



LAUREL VILLAGE: Low Density, High Value



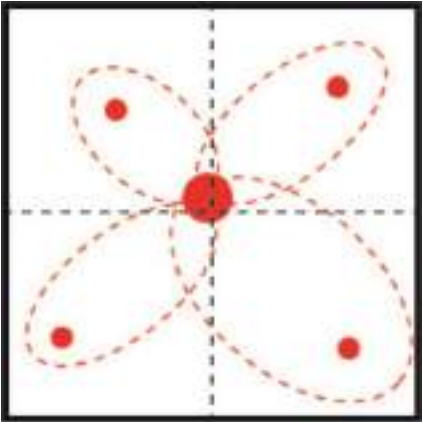
EMBARCADERO: High Density, High Value

HIGH VALUE / HIGH DENSITY (Embarcadero)

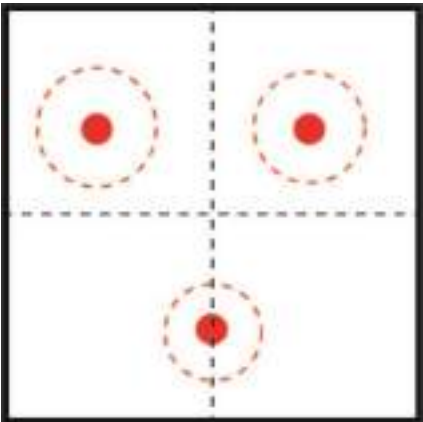
Couple nodes with largest conversion areas

LOW VALUE / LOW DENSITY (Third Street)

Centrally locate bulk of parking within a single node, with micro/satellite locations at periphery



THIRD STREET: Low Density, Low Value

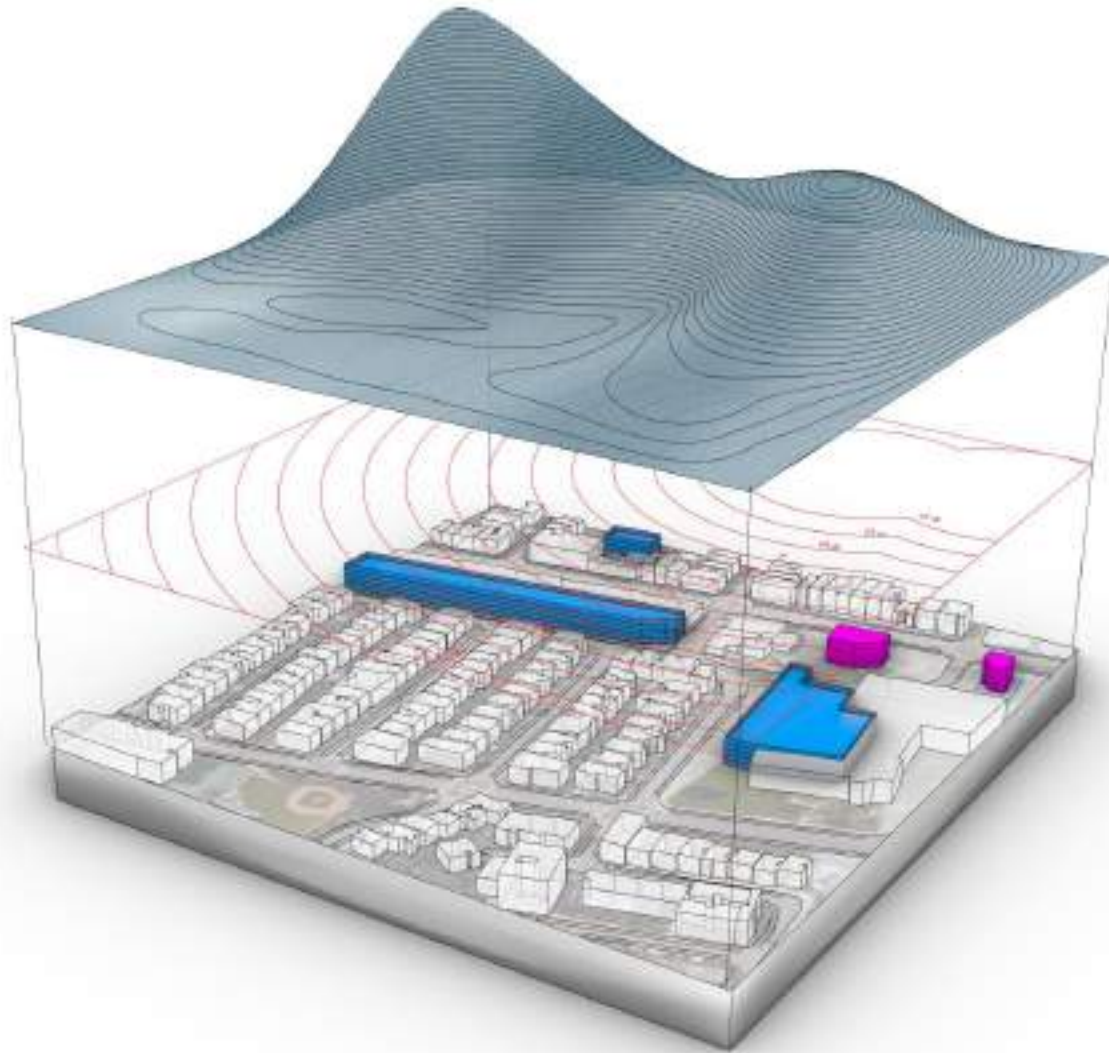


TENDERLOIN: High Density, Low Value

LOW VALUE / HIGH DENSITY (Tenderloin)

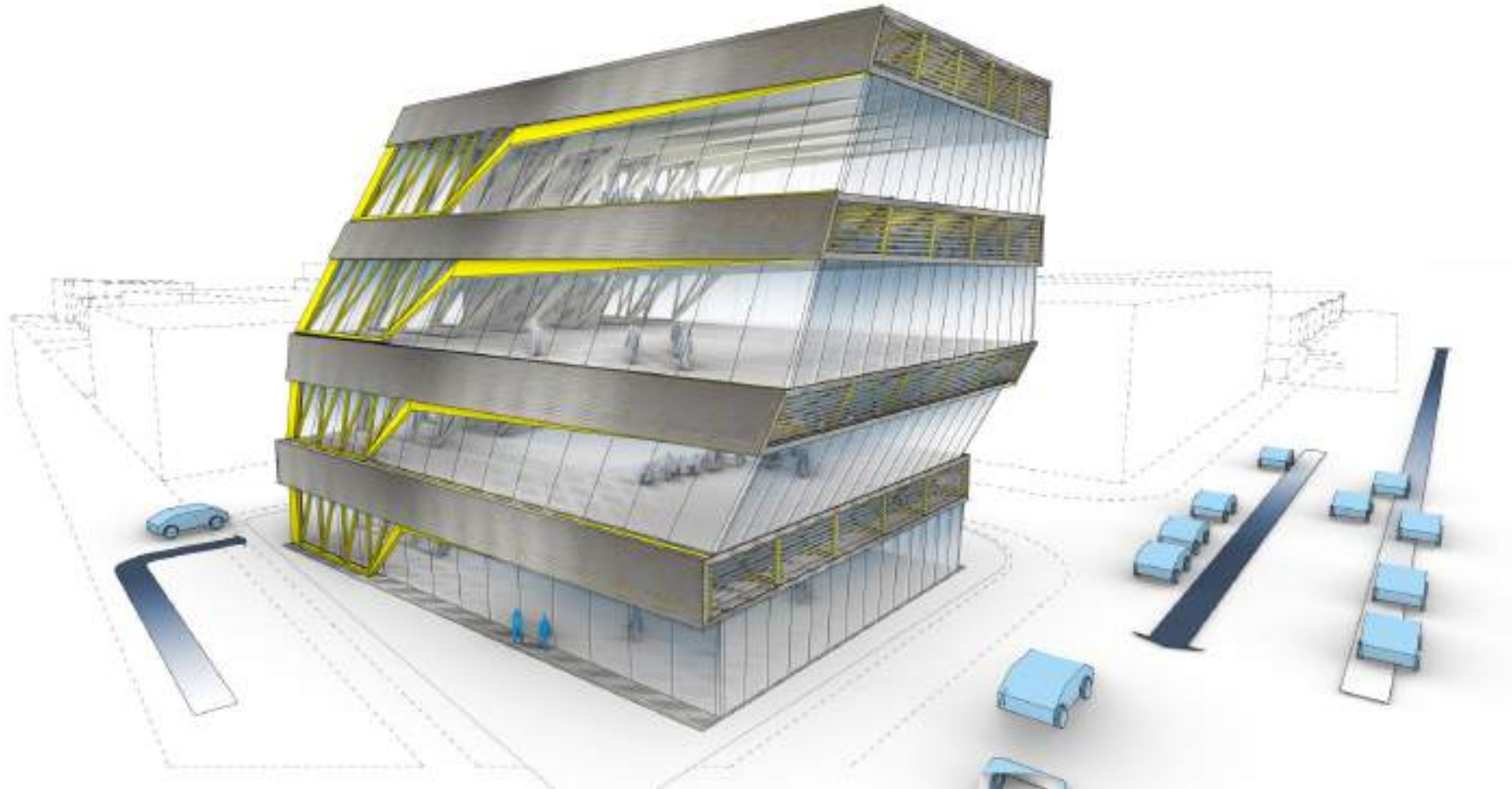
Evenly distribute smaller assemblies around the quadrant, primarily governed by infrastructure.

low density, high value

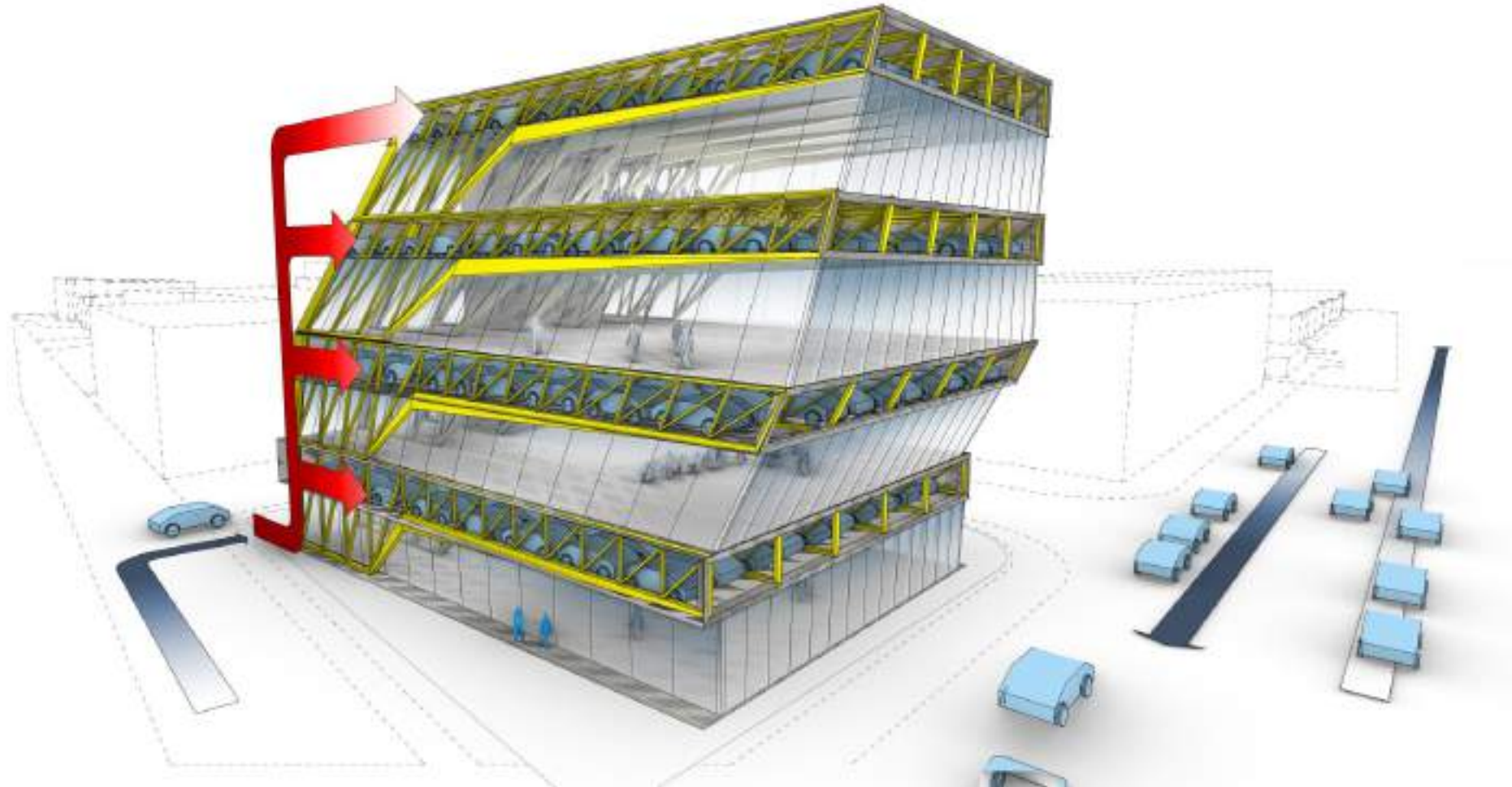


TOTAL AVAILABLE AREA:		152783 (S.F.)
PERCENTAGE OF PARKING:		8.8%
TOTAL EXISTING PARKING:		1888 (# STALLS)
LAND PRICE:		250 (\$/S.F.)
TOTAL LAND VALUE:	\$38,195,750	
CONVERSION RATE:	85%	
AREA OF CONVERTED PARKING:	89098 (S.F.)	
FAR:		5
BUILDING PRICE:	300(\$/S.F.)	
TOTAL VALUE CREATED:		\$133,650,000

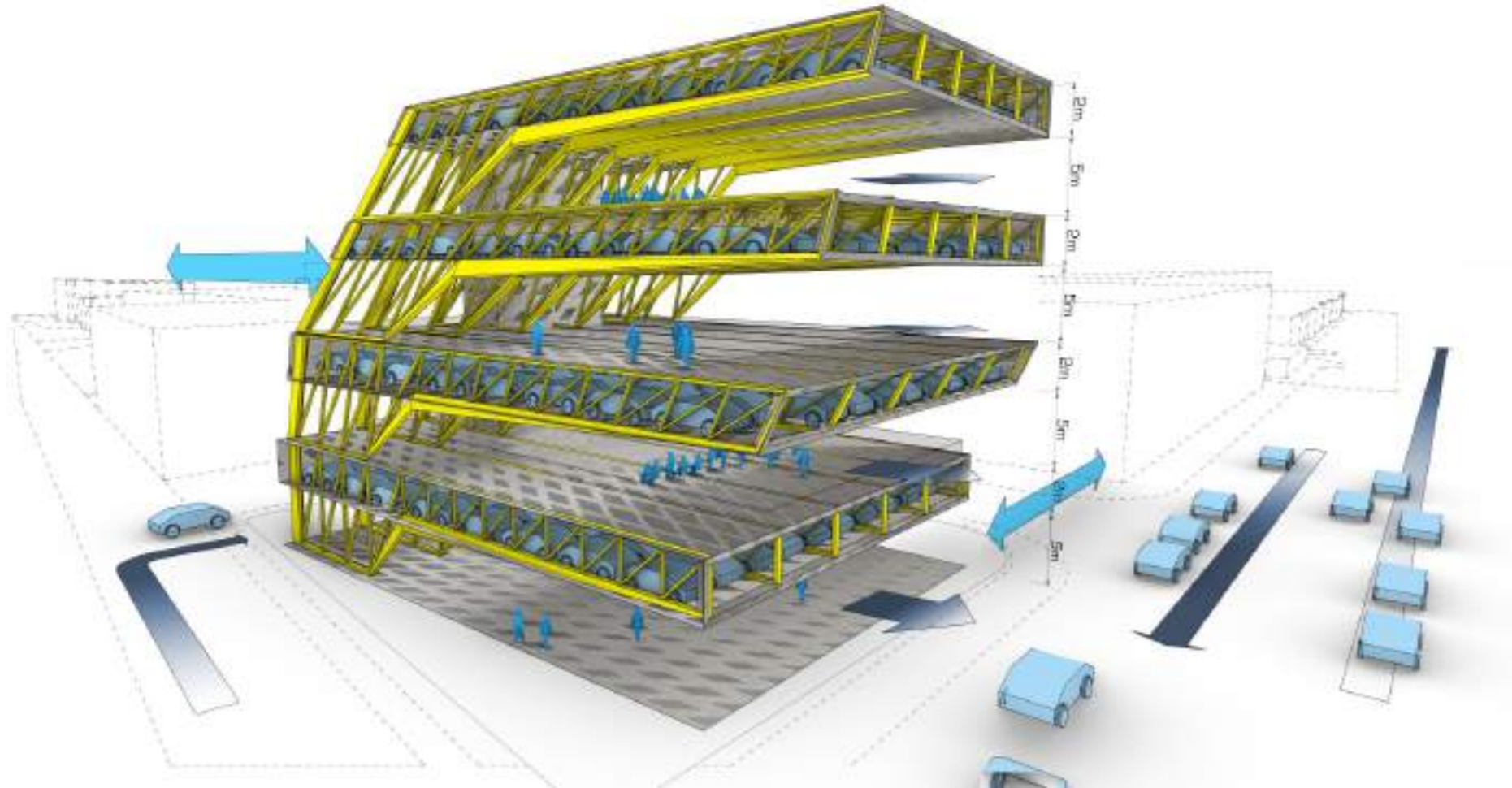
The Community Hall (Level 2)



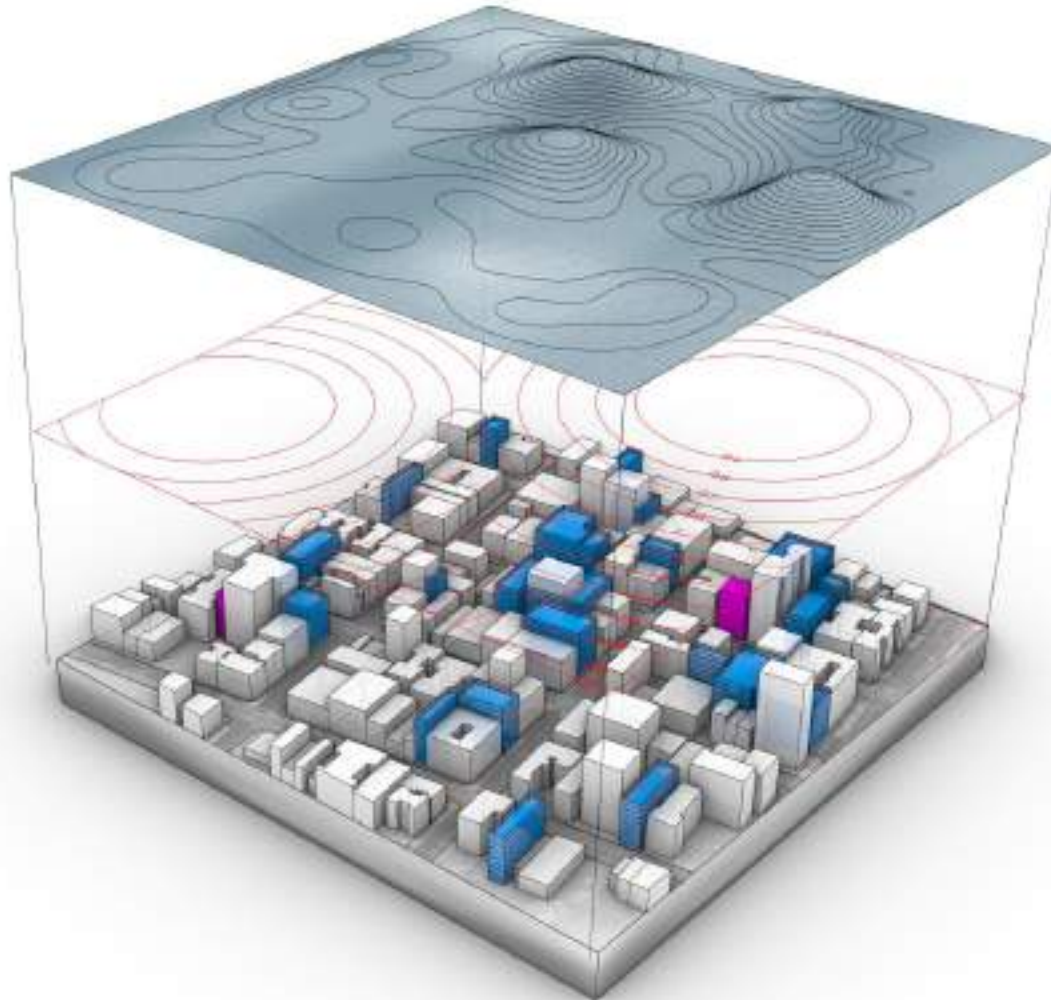
The Community Hall (Level 2)



The Community Hall (Level 2)

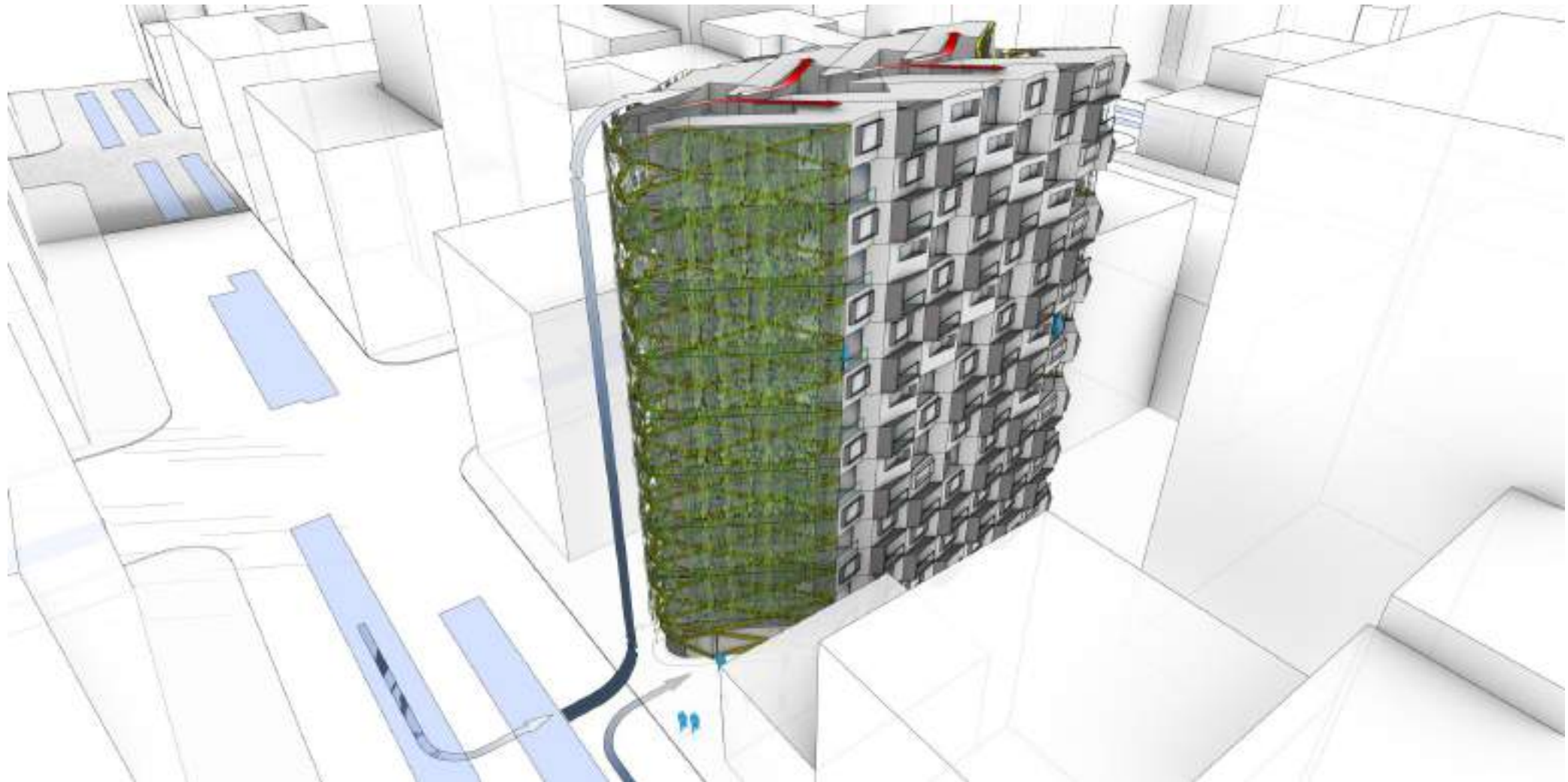


high density, low value

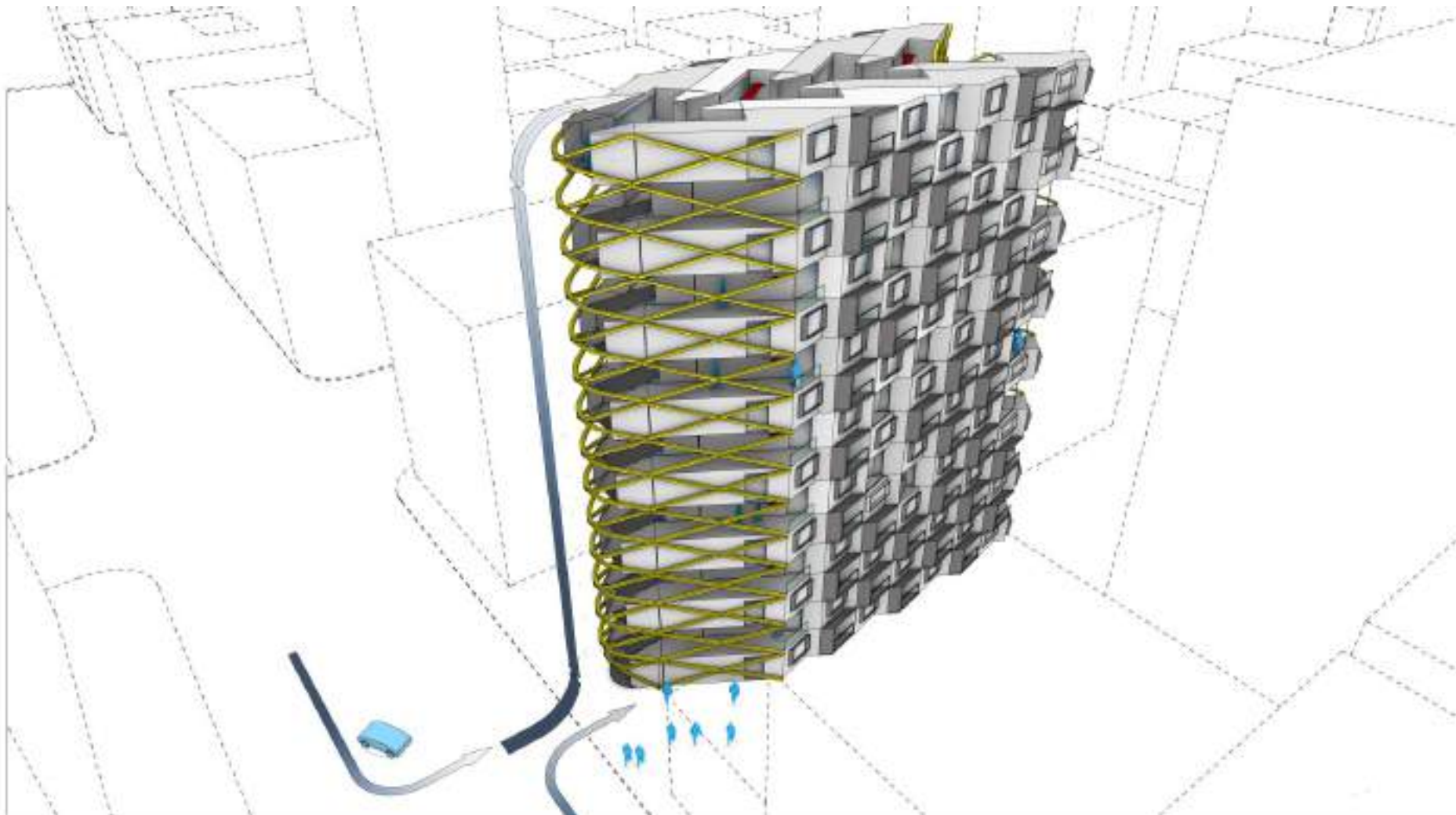


TOTAL AVAILABLE AREA:	146,495 S.F.
PERCENTAGE OF PARKING:	8.4%
TOTAL EXISTING PARKING:	1109 (# STALLS)
LAND PRICE:	150 (\$/S.F.)
TOTAL LAND VALUE:	21974250 (\$)
CONVERSION RATE:	75%
AREA OF CONVERTED PARKING:	136911 (S.F.)
FAR:	7 (\$)
BUILDING PRICE:	200(\$/S.F.)
TOTAL VALUE CREATED:	\$191,670,000

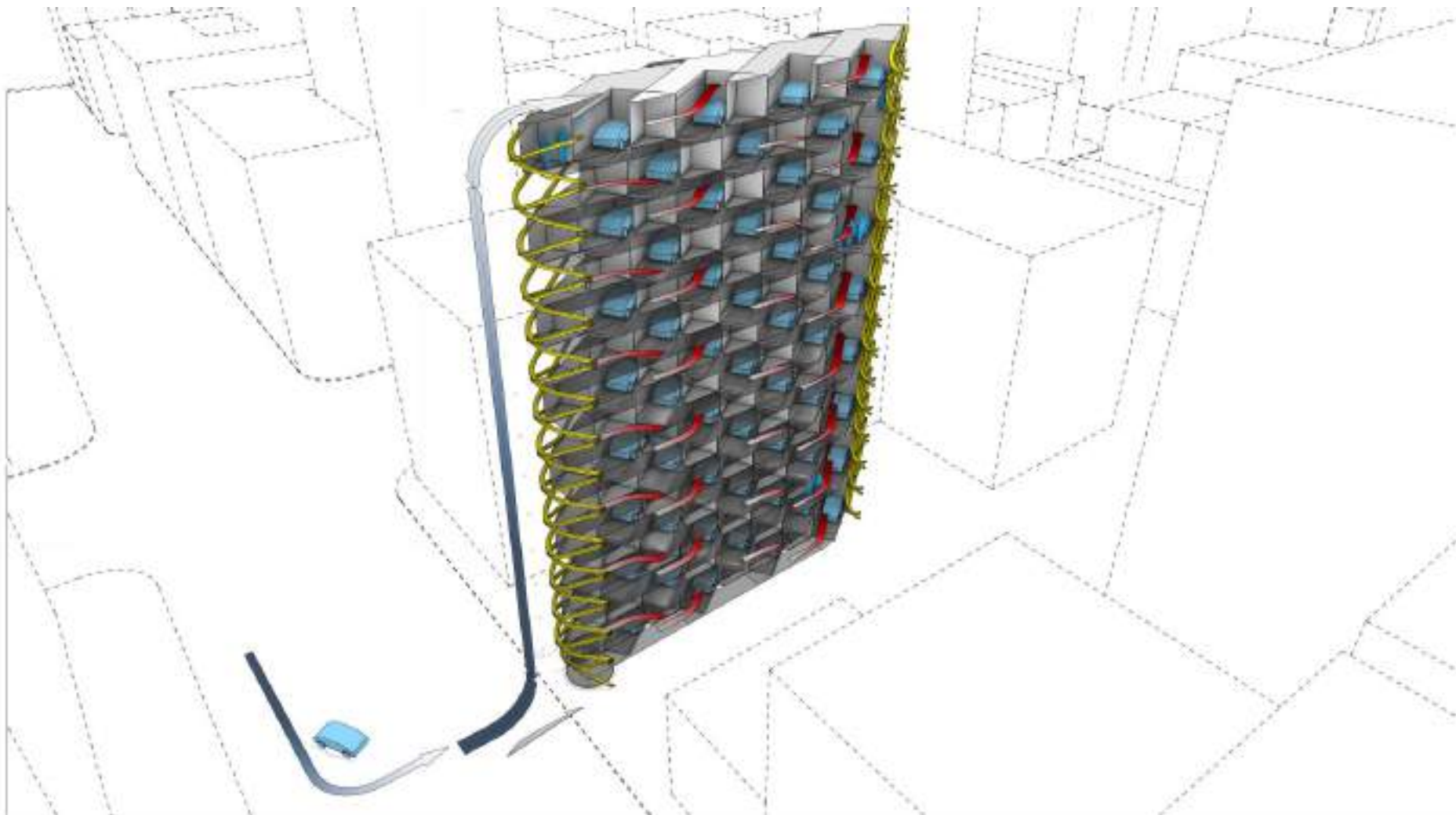
The Mews (Level 3)



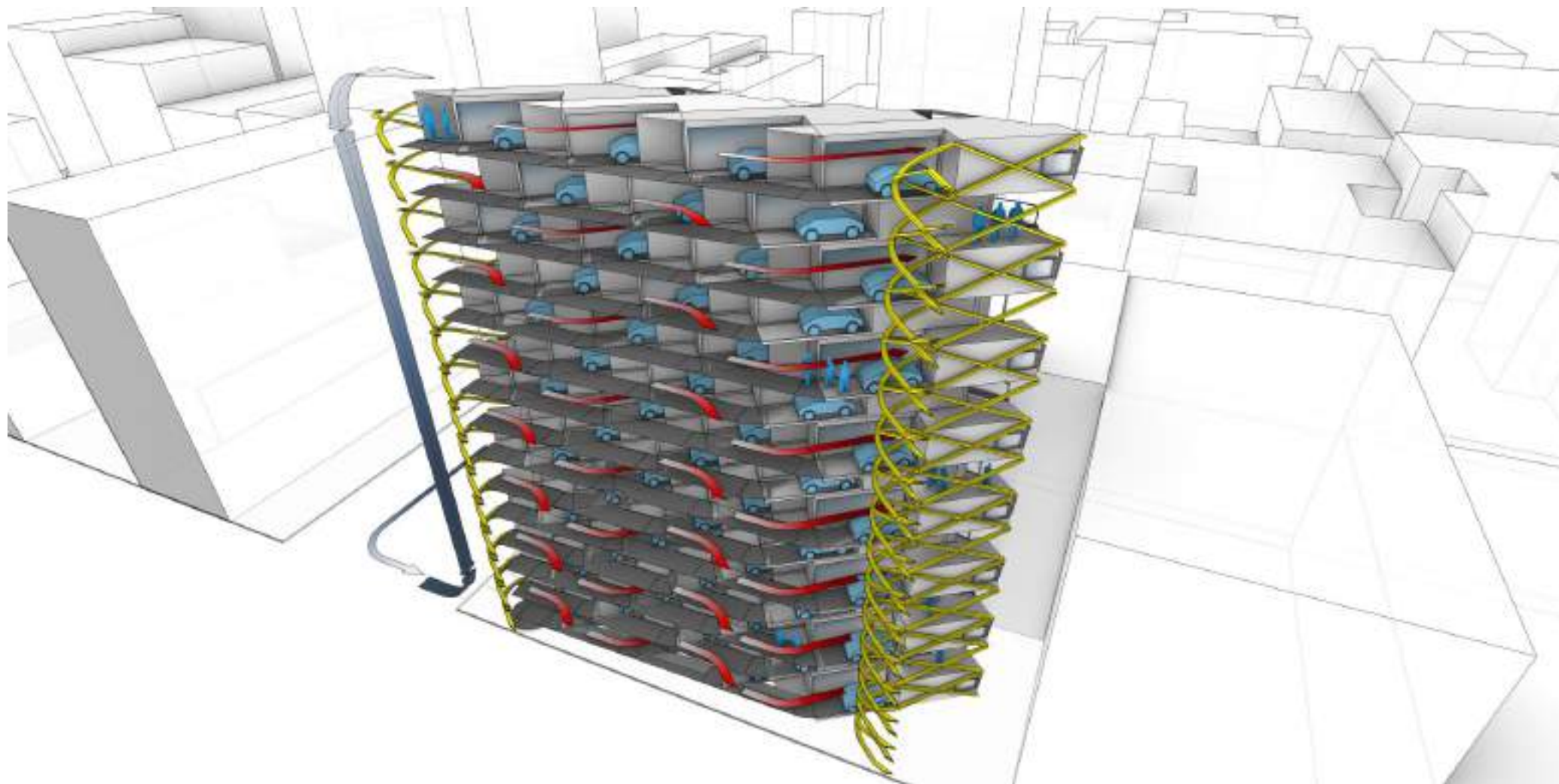
The Mews (Level 3)



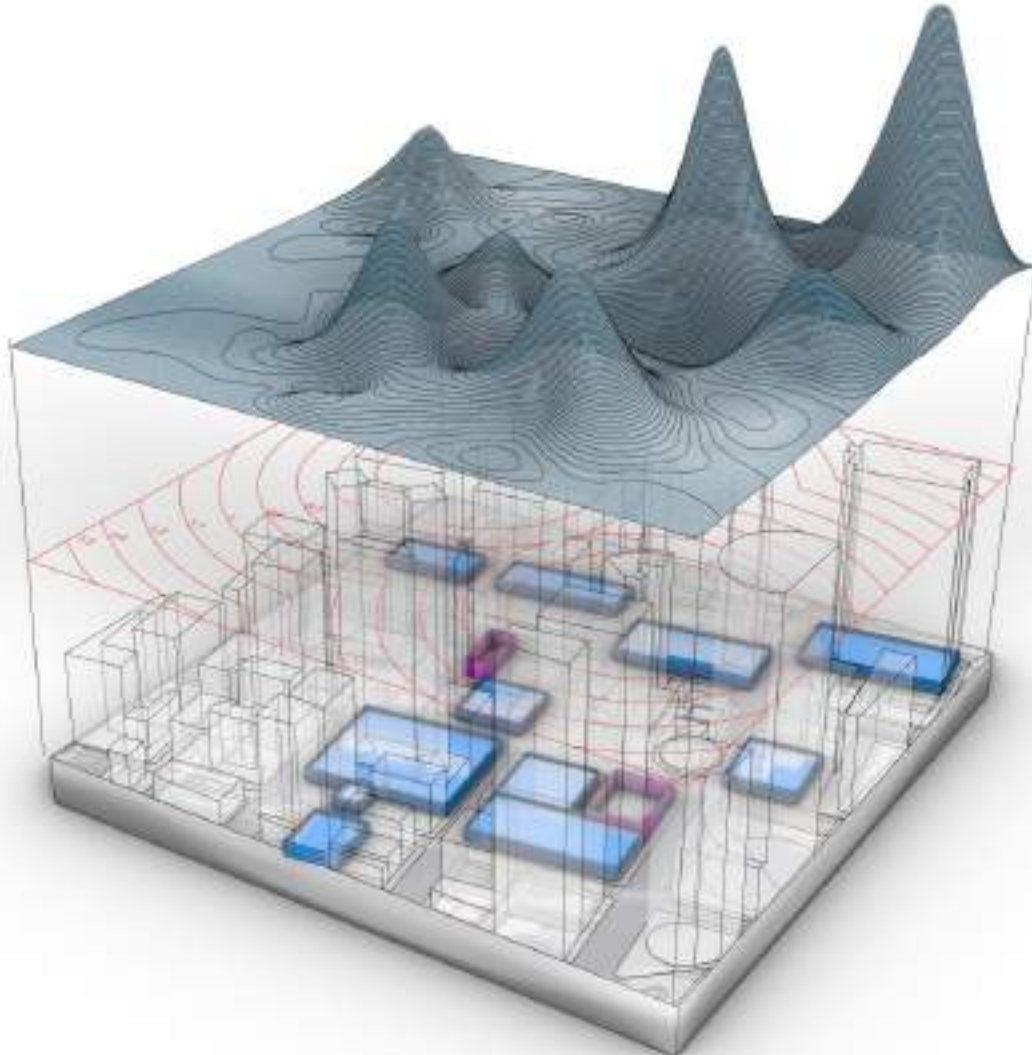
The Mews (Level 3)



The Mews (Level 3)

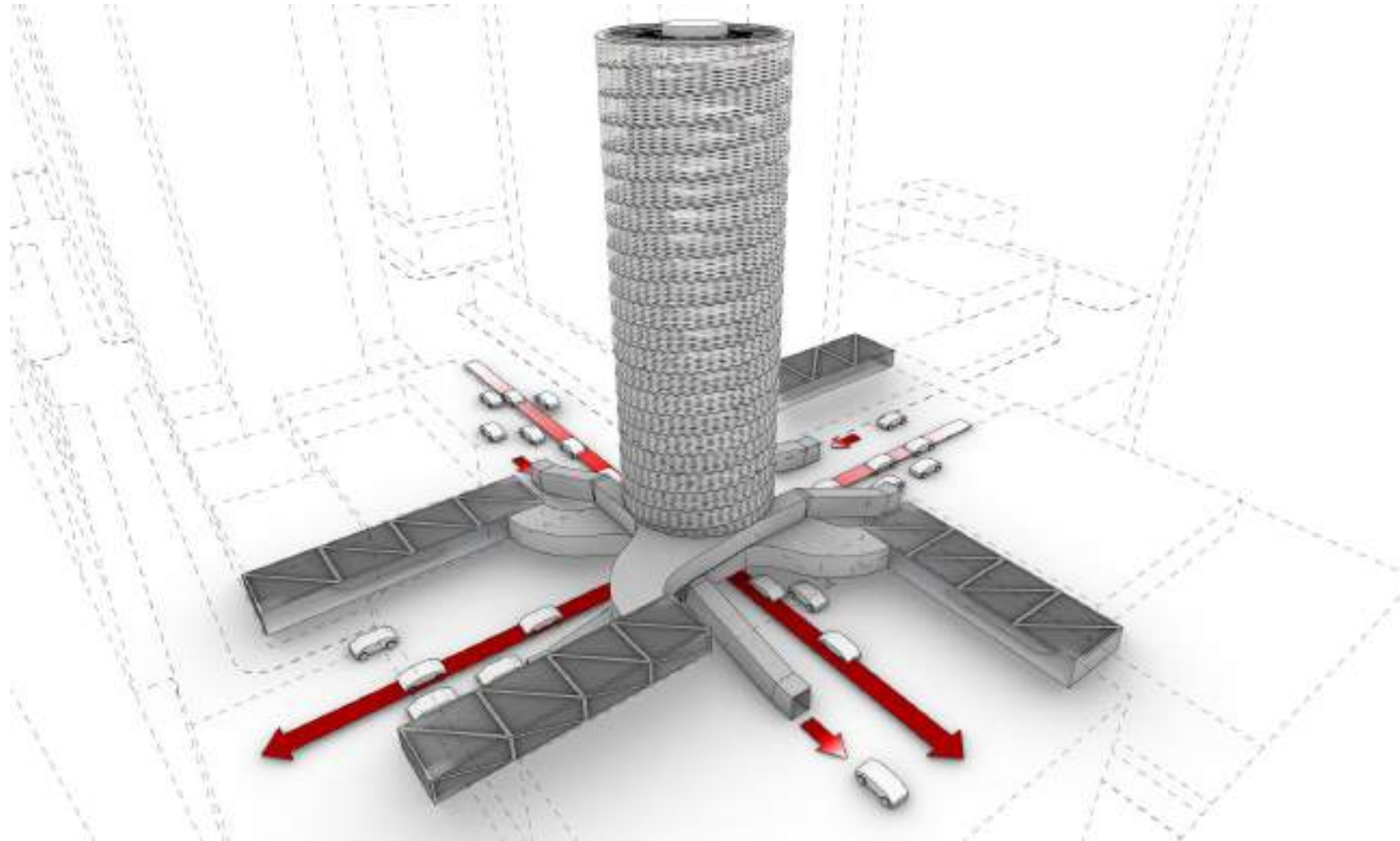


high density, high value

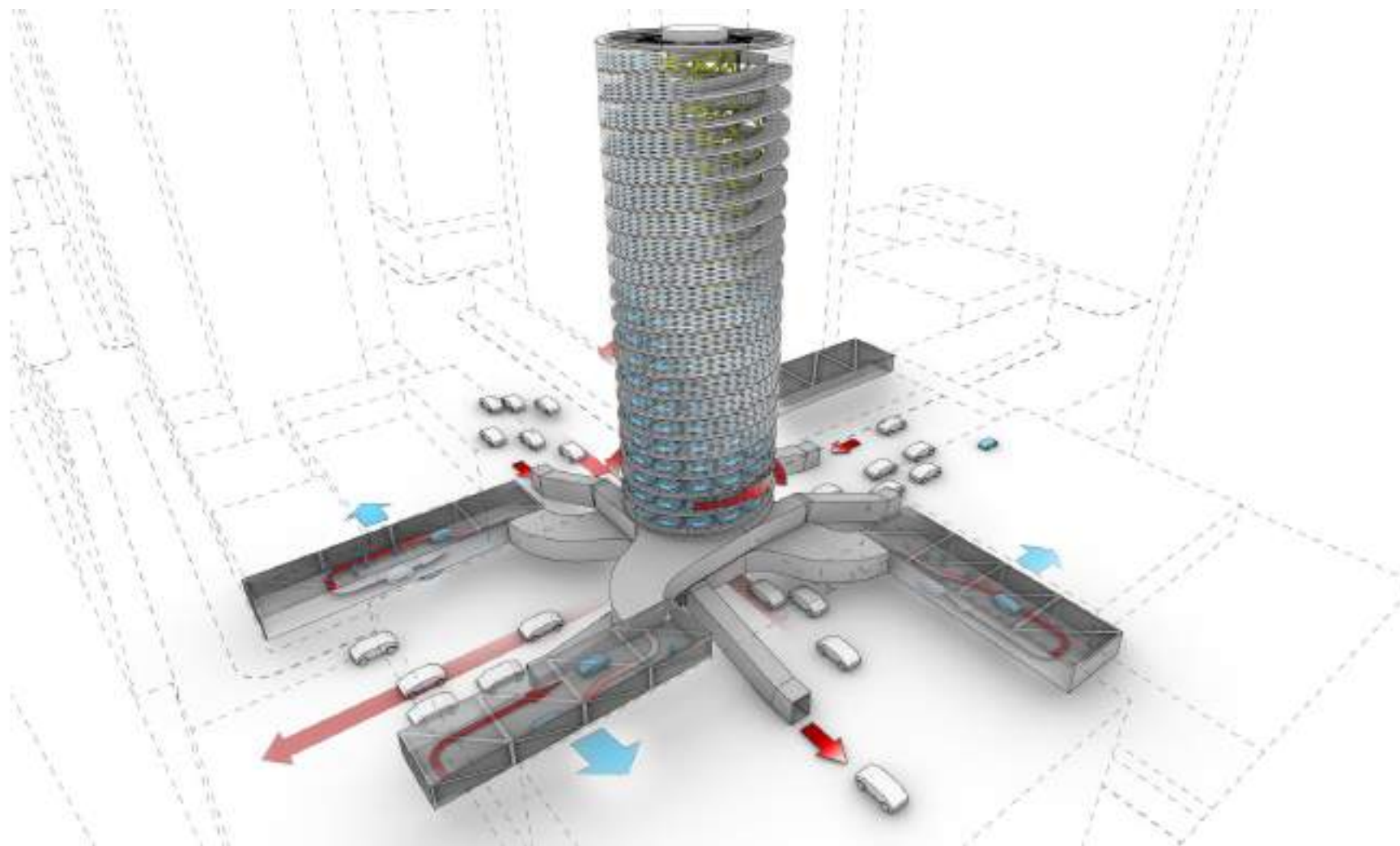


TOTAL AVAILABLE AREA:		317747 (S.F.)
PERCENTAGE OF PARKING:		18.2%
TOTAL EXISTING PARKING:		3110 (# STALLS)
LAND PRICE:		350 (\$/S.F.)
TOTAL LAND VALUE:	111211450 (\$)	
CONVERSION RATE:	85%	
AREA OF CONVERTED PARKING:	251851(S.F.)	
FAR:		3 (\$)
BUILDING PRICE:	300(\$/S.F.)	
TOTAL VALUE CREATED:		\$266,665,500

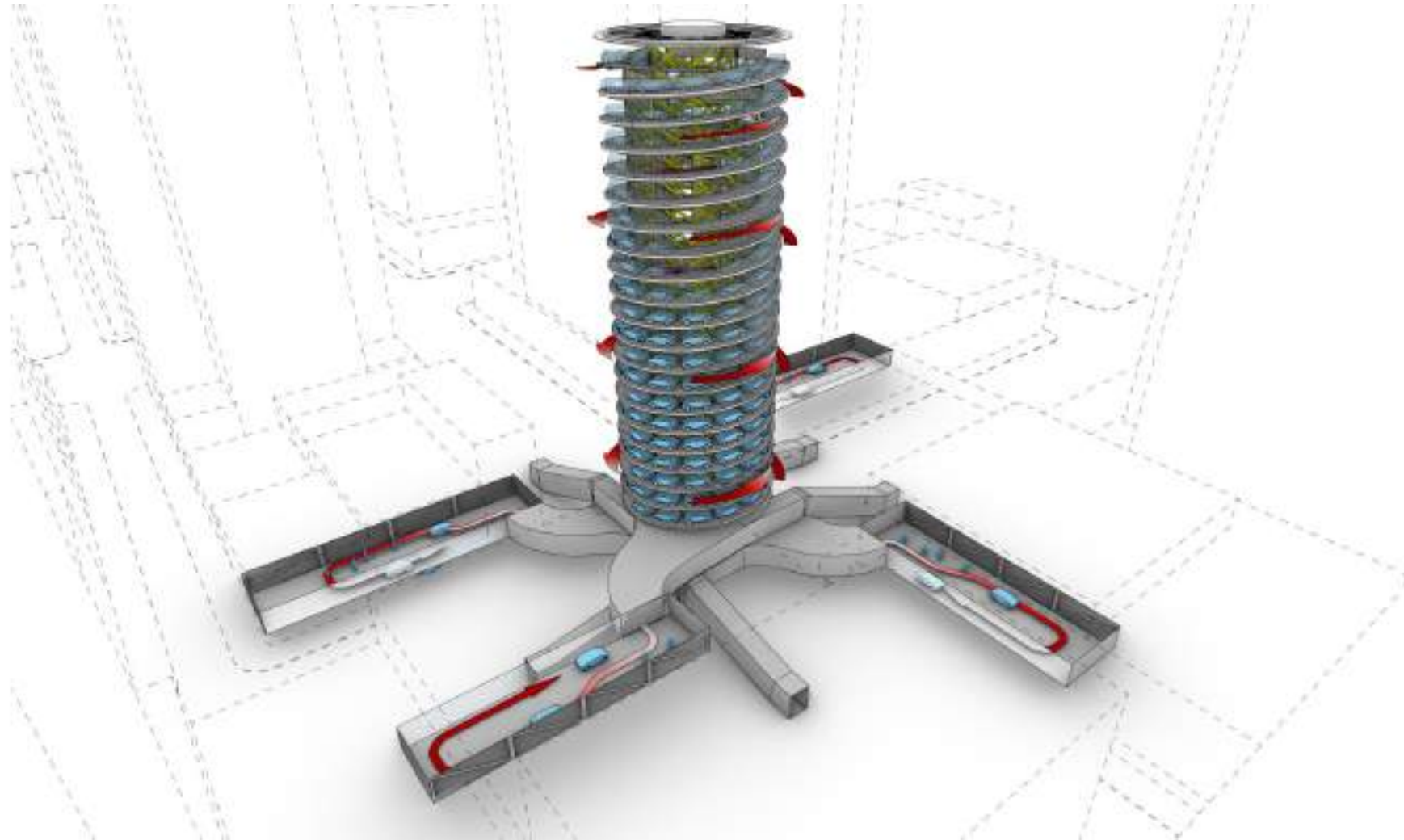
The Lobby (Level 4)



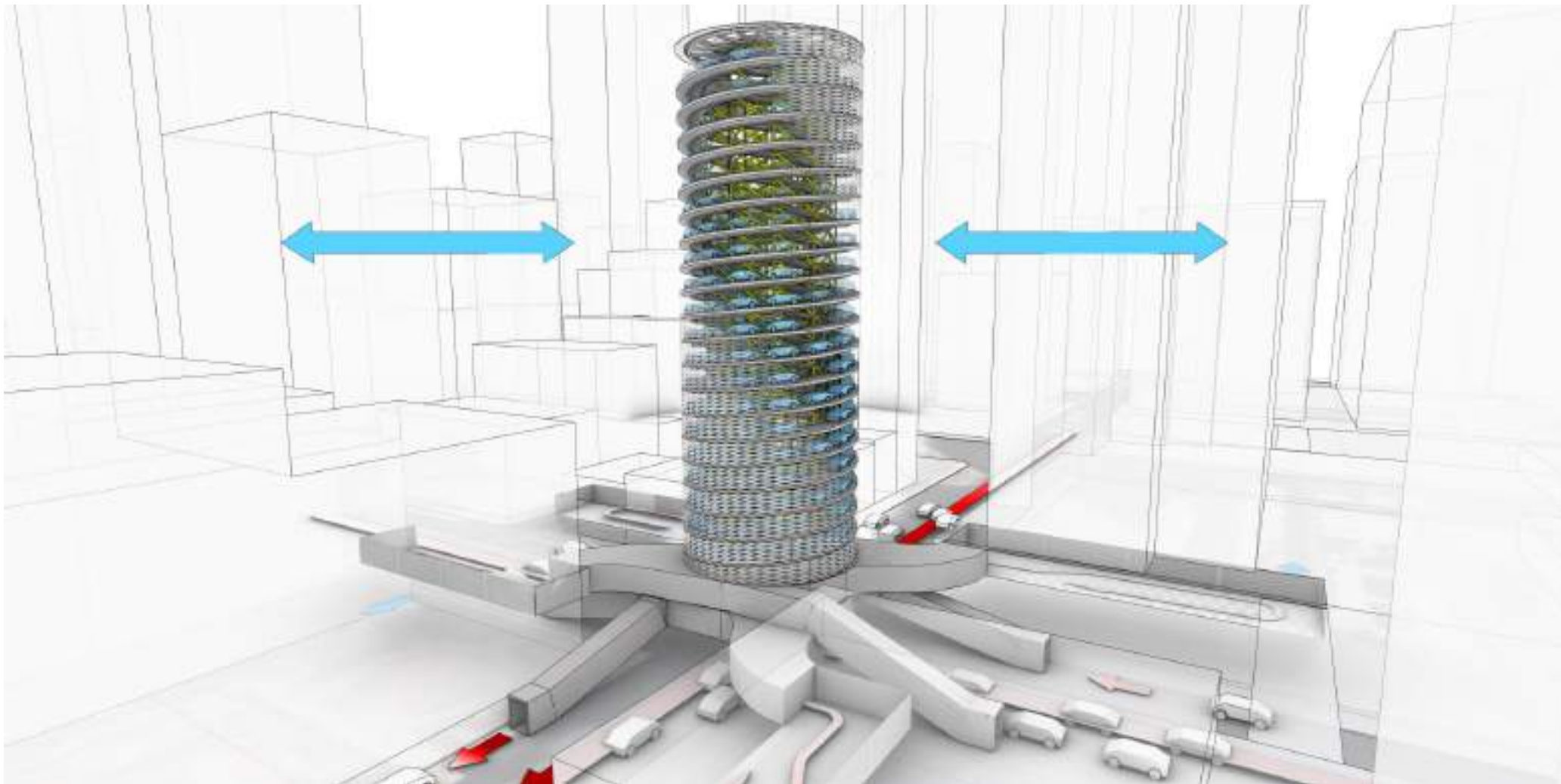
The Lobby (Level 4)



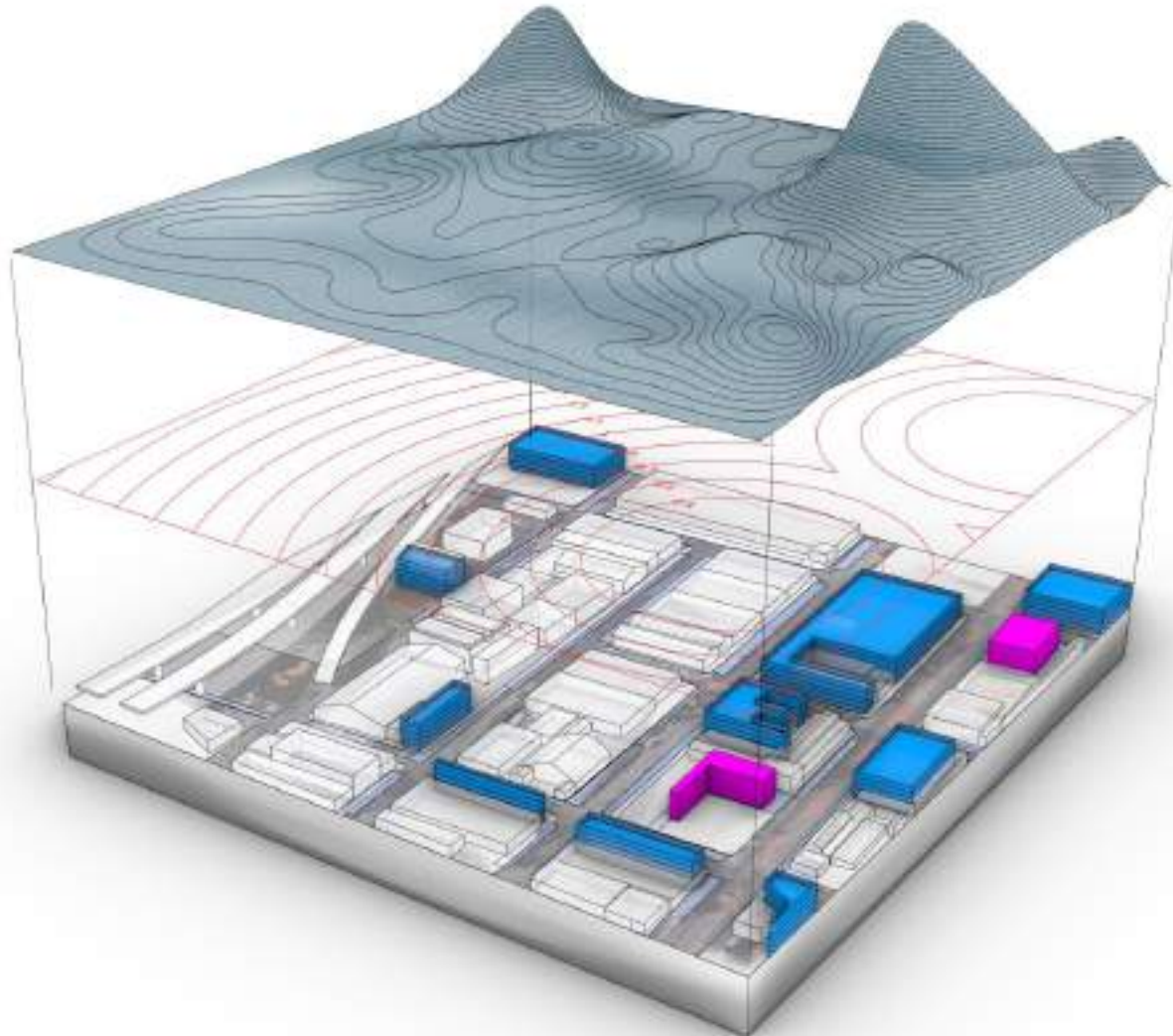
The Lobby (Level 4)



The Lobby (Level 4)



low density, low value

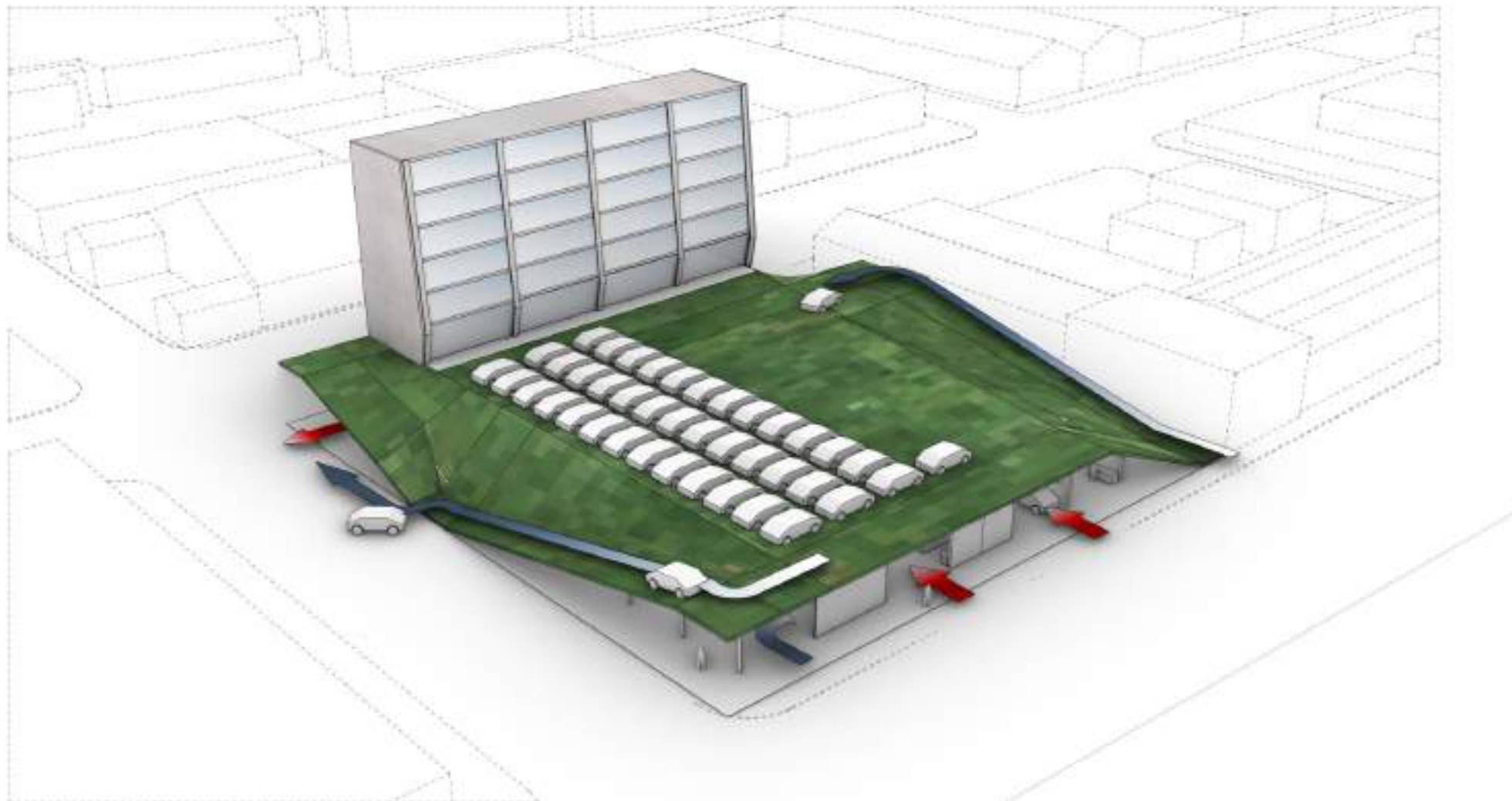


TOTAL AVAILABLE AREA:	191559 (S.F.)
PERCENTAGE OF PARKING:	11%
TOTAL EXISTING PARKING:	2022 (# STALLS)
LAND PRICE:	150 (\$/S.F.)
TOTAL LAND VALUE:	28733850 (\$)
CONVERSION RATE:	75%
AREA OF CONVERTED PARKING:	172135 (S.F.)
FAR:	5 (\$)
BUILDING PRICE:	200(\$/S.F.)
TOTAL VALUE CREATED:	\$172,140,000

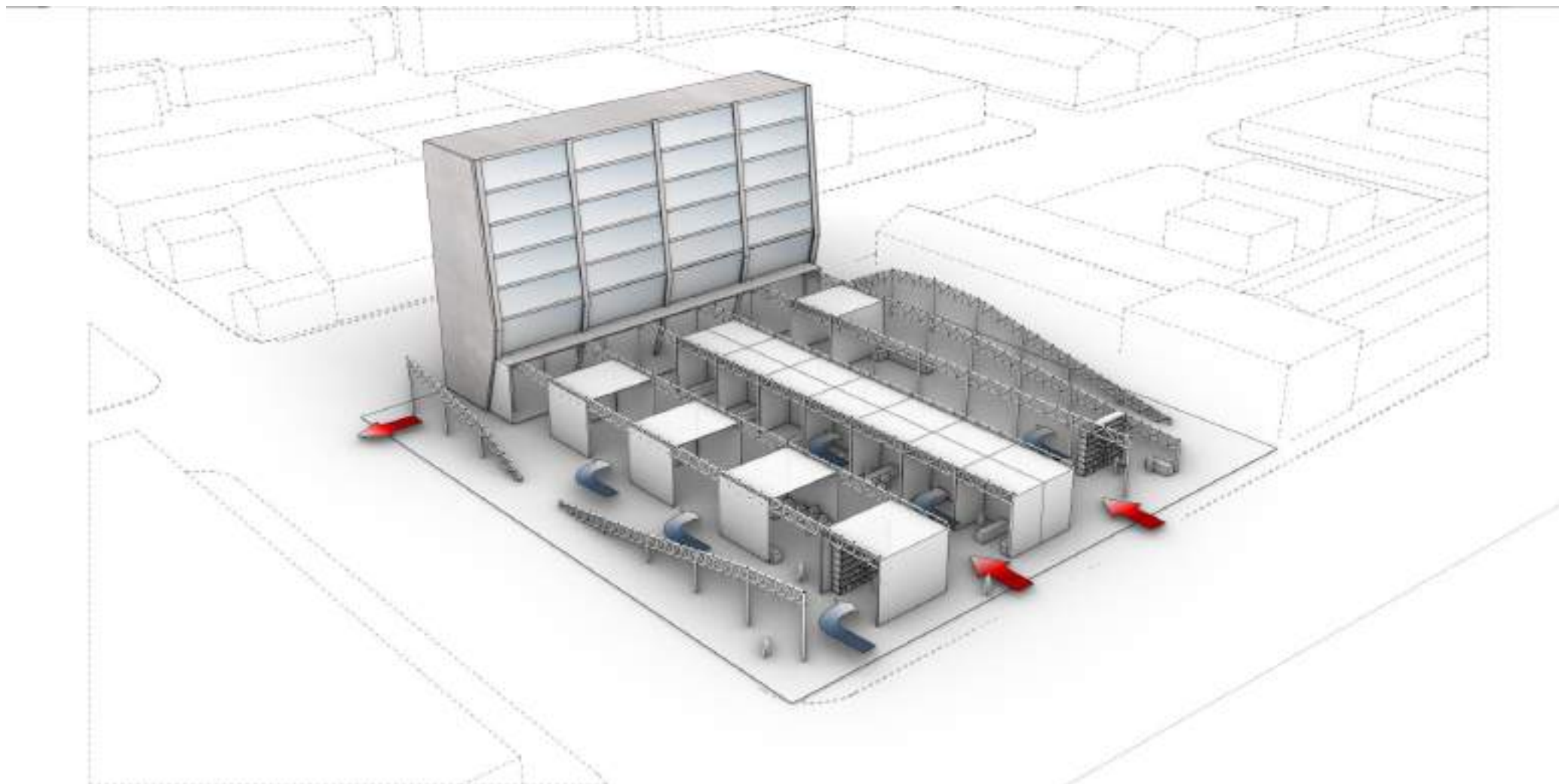
The Market (Level 5)



The Market (Level 5)



The Market (Level 5)



The Market (Level 5)



collaborating in a dynamic environment

