



2014 .11.20 Tokyo, Forum 8

都市デザインと計画支援
Urban Design and Planning Support
Using VR

Z. Shen (沈振江)

Kanazawa University, JP



Presentation for Planning and design

Planning learning

Planning & design proposal

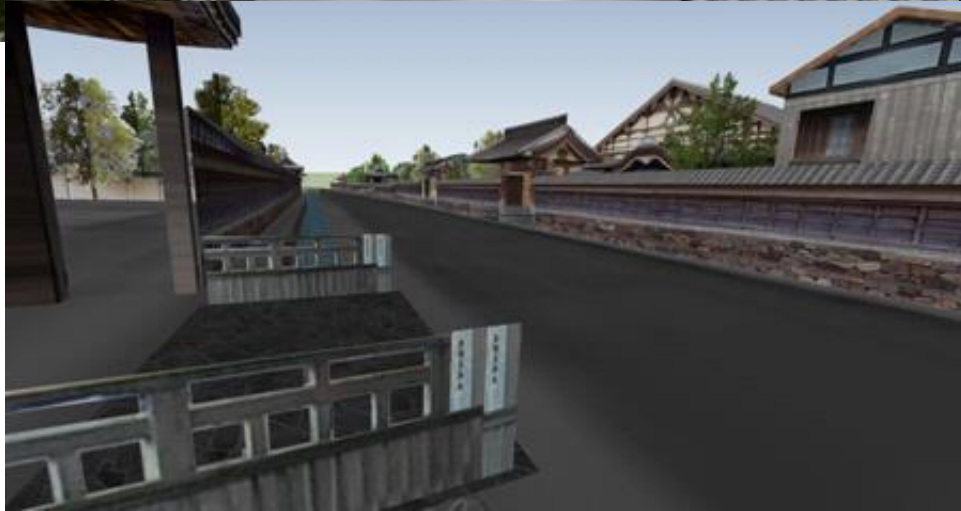
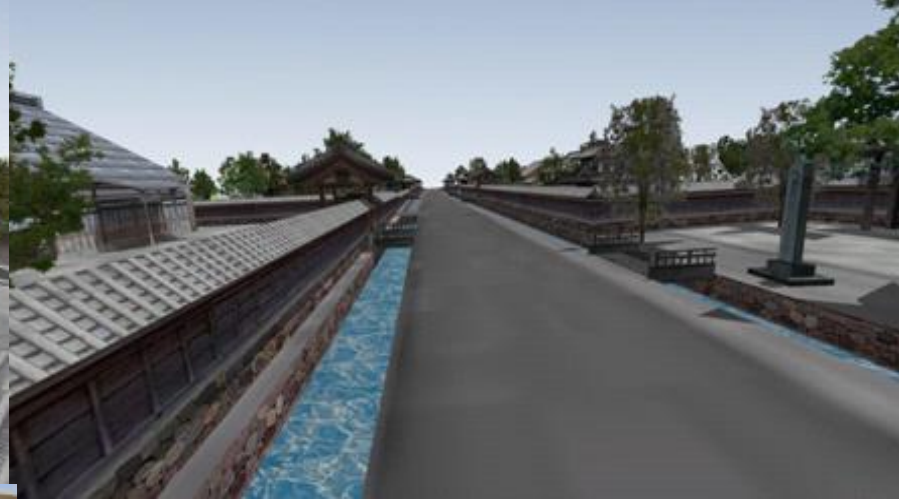
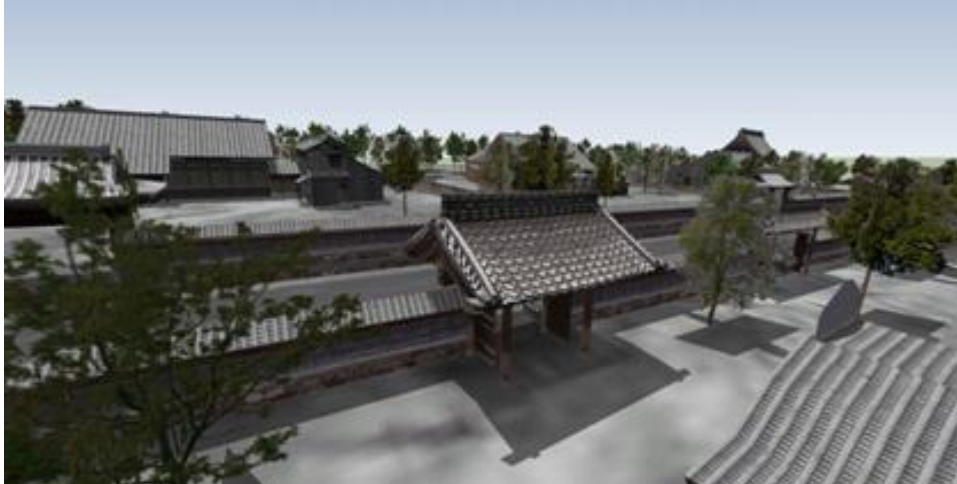
Deliberation and Planning review

Cloud-based Virtual Reality and Planning support

***A image of new tool: Buildable space
based on planning regulations***



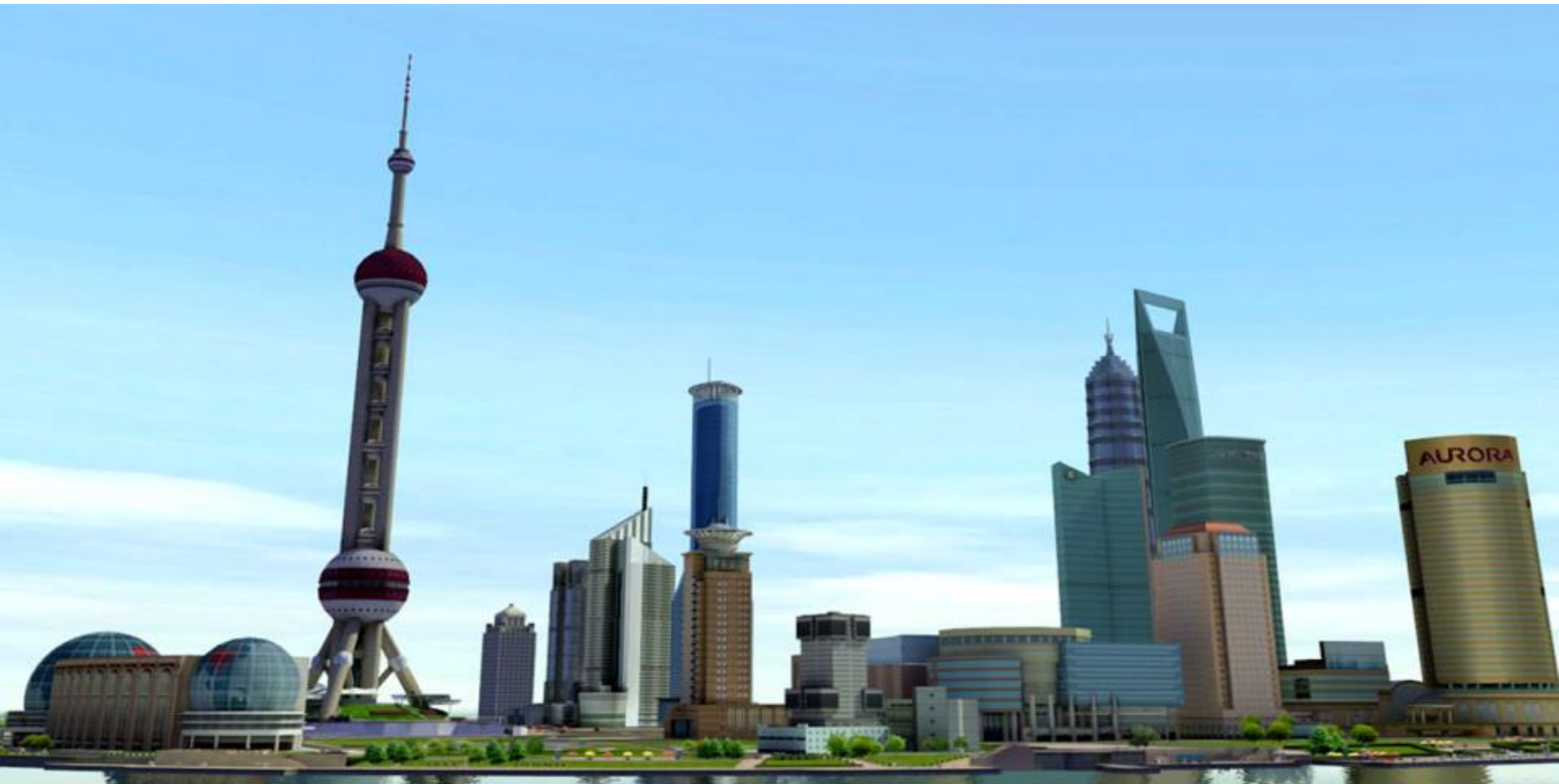
◆ A design tool using VR cloud computing (Google) for urban design



Teramachi District, Kanazawa
UIA Region IV
Architecture Preservation
Award
Based Google Tech.



Presentation for Lujiazui CBD Development Planning(Shanghai)





Presentation for Xiamen Station Development Planning





Presentation for Beijing Tiananmen Sqaure





Presentation for Olympic Game Main Stadium





Planning representation Planning Exhibition Hall

GviTech

<http://www.gvitech.com>



Presentation for Planning and design

Planning learning

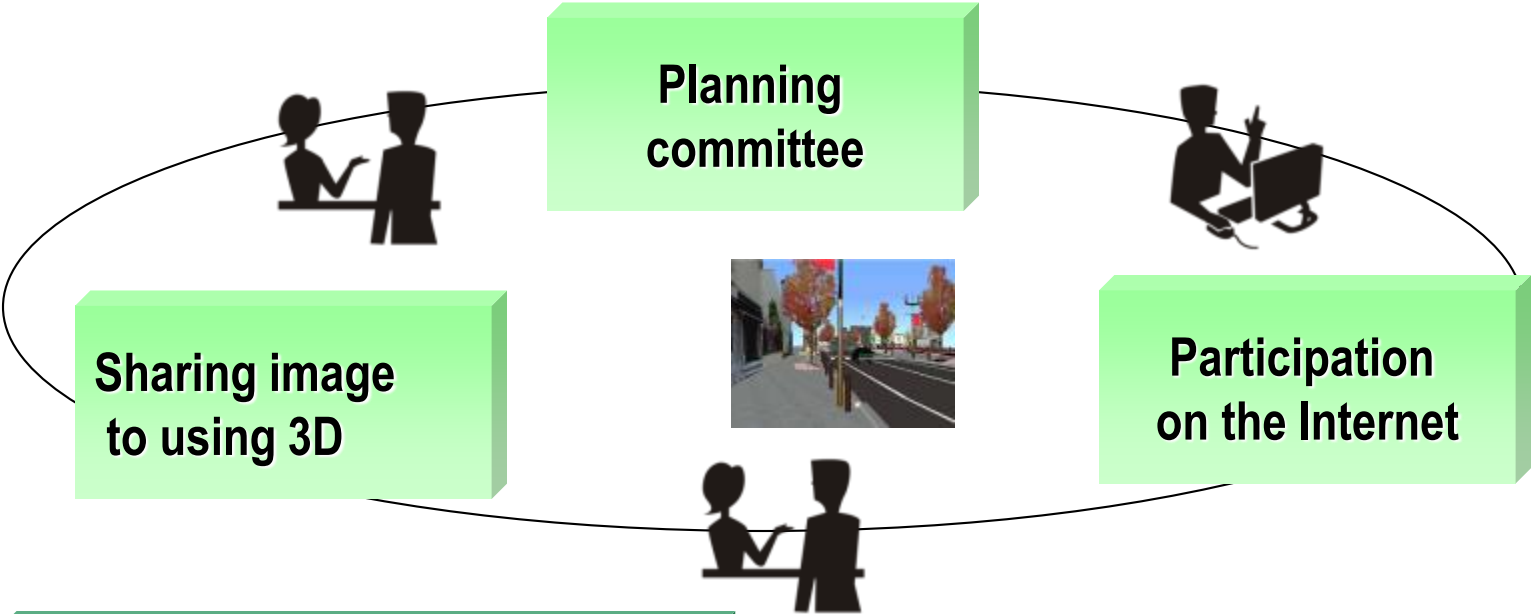
Planning and design proposal

Planning review

Cloud-based Virtual Reality and Planning support



Planning support using VR to urban planning and design for public participation

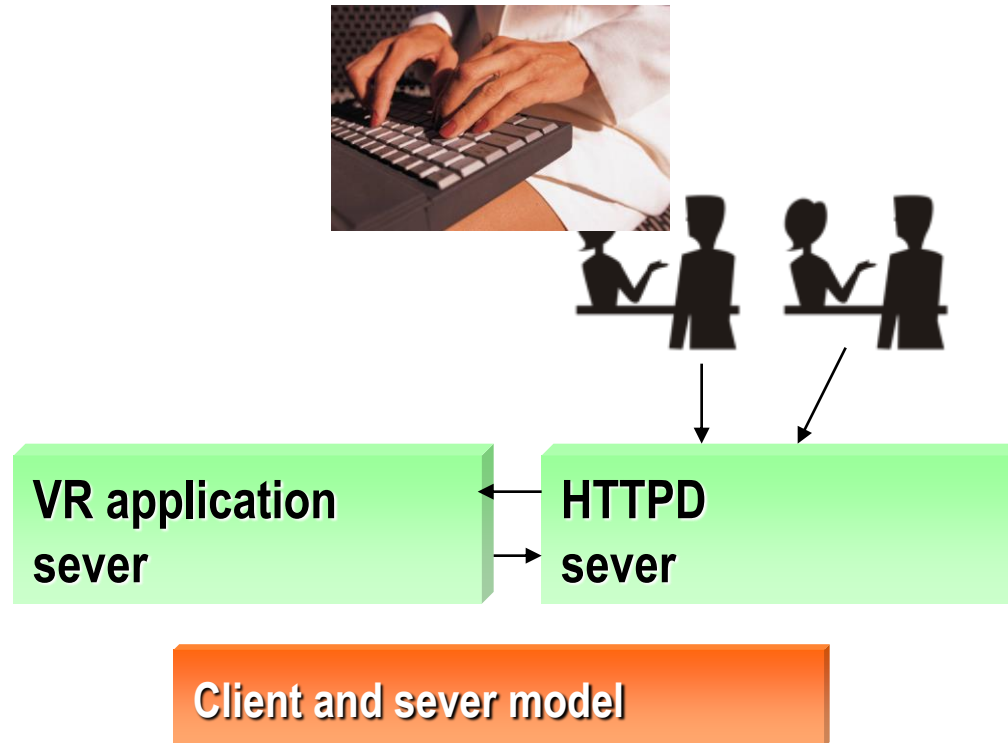


A solution for planning support

Visualization of planning and design

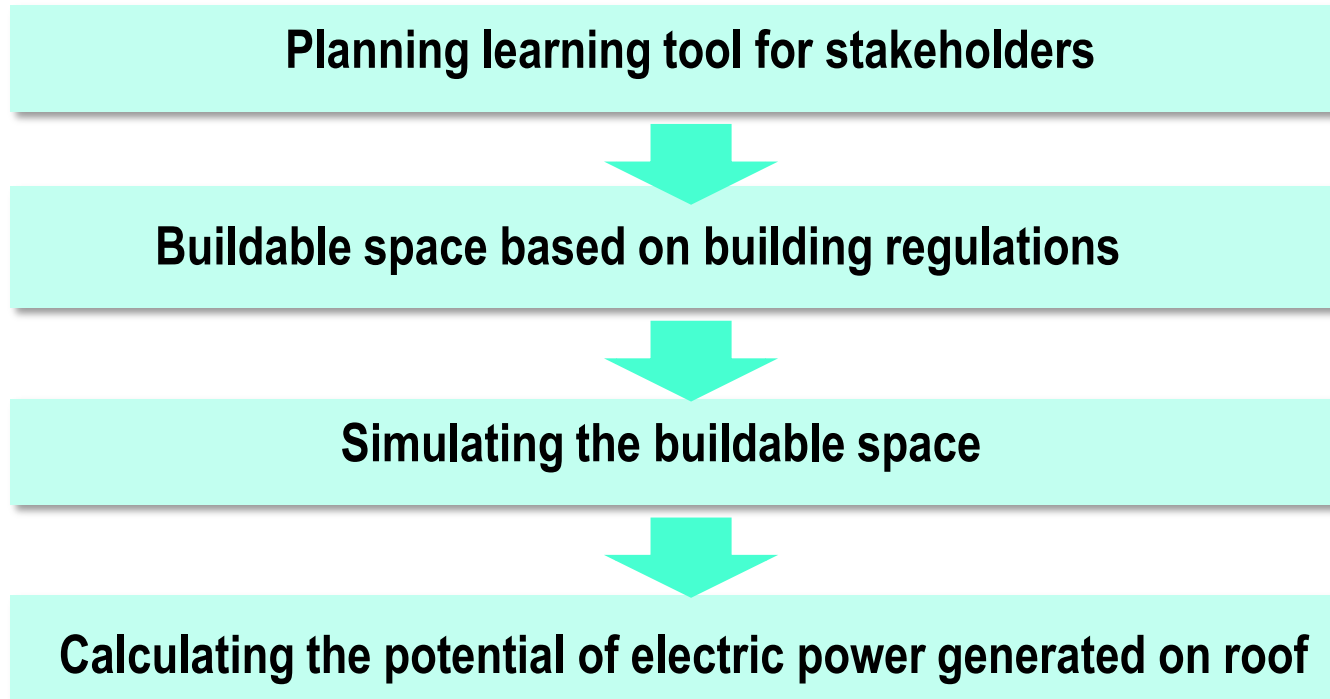


A conventional model for planning support





A learning tool for studying planning regulation (JSPS)





◆ A learning tool for planning regulation tool (JSPS,2008)

The screenshot displays a software interface for planning regulation. At the top, there are tabs for '建築物モデル' (Building Model), '敷地条件' (Site Conditions), '用途地域' (Use District), '建ぺい率' (Floor Area Ratio), '容積率' (Floor Area Ratio), and '絶対的高さ制限' (Absolute Height Limit). Below these are buttons for '道路斜線' (Road Slope), '隣地斜線' (Adjacent Land Slope), '北側斜線' (North Side Slope), '太陽光発電パネル' (Solar Panel), and '太陽光発電量ポテンシャル' (Solar Energy Potential). The main area features a 3D model of a building on a plot, with a bar chart showing solar energy potential by month. The bar chart has 12 bars, with the highest values in the summer months (June, July, August). A red arrow labeled 'GUI (Graphic User Interface)' points to the right-side control panel, and a blue arrow labeled '3D model' points to the 3D building model.

GUI (Graphic User Interface)

3D model

【用途地域】
【用途地域】= 第一種低層住居専用
第一種低層住居専用 第二種低層住居専用
第一種中高層住居専用 第二種中高層住居専用
第一種住居 第二種住居
準住居

【道路斜線】
Show in 3D
【道路斜線勾配】= 1.25
【道路斜線適用距離(m)】= 20

【建築物モデル】
【階数】= 3階
【建物建ぺい率】= 7.2/10
【建物容積率】= 19.0/10
地上 2階
南側後退(m) = 1.00
西側後退(m) = 1.00
東側後退(m) = 1.00
北側後退(m) = 0.00

【太陽光発電パネル】
Show in 3D
【発電パネル】= 7×2枚
【パネル位置】= (0.8, 1.9)
【パネル傾斜角(度)】= 25
【パネル方位角(度)】= 180

1月 2月 3月 4月 5月 6月 7月 8月 9月 10月 11月 12月

建築物モデル自動計算(Beta) 0.10 カメラリセット



Regulation on building height

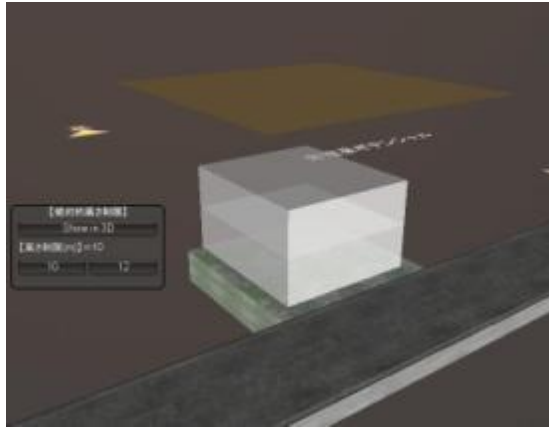


図13. 絶対の高さ制限 = 10m

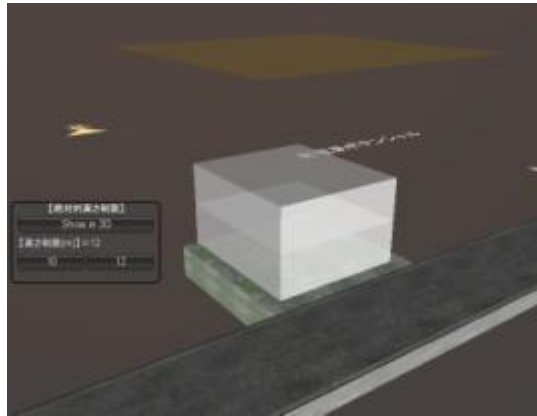


図14. 絶対の高さ制限 = 12m

Oblique of front road

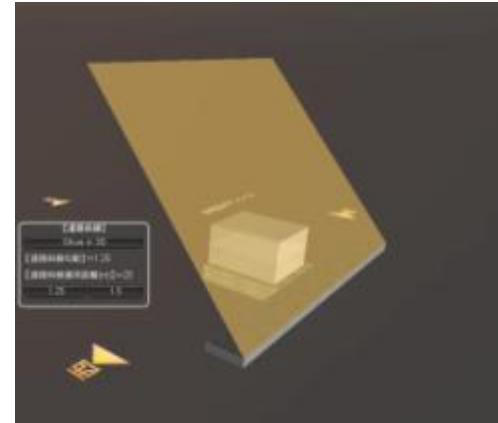


図15. 道路斜線勾配 = 1.25 適用距離 = 20m

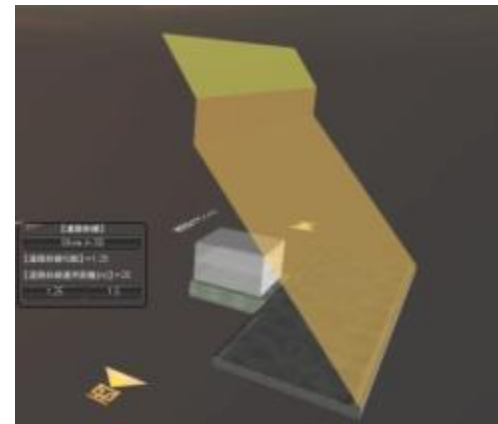


図16. 前面道路幅が12m超、道路斜線勾配 = 1.25 適用距離 = 20m



Oblique of neighbor lot

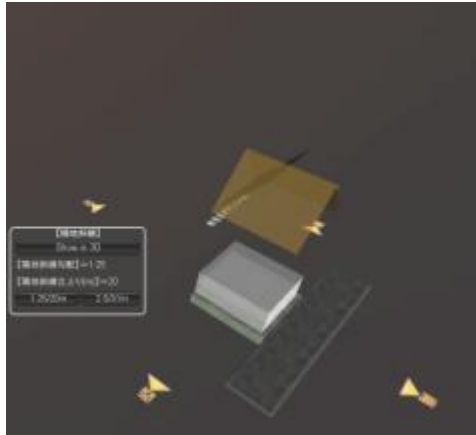


図19. 隣地斜線勾配=1.25 立上り距離=20m

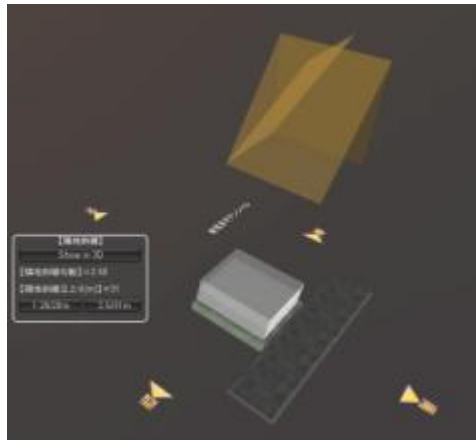


図20. 隣地斜線勾配=2.5 立上り距離=31m

Oblique of North side

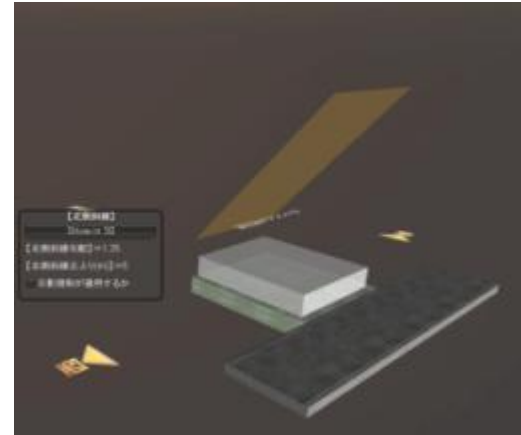


図21. 北側斜線勾配=1.25 立上り距離=5m

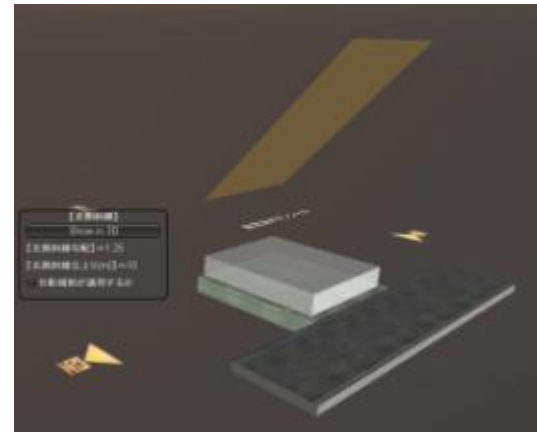


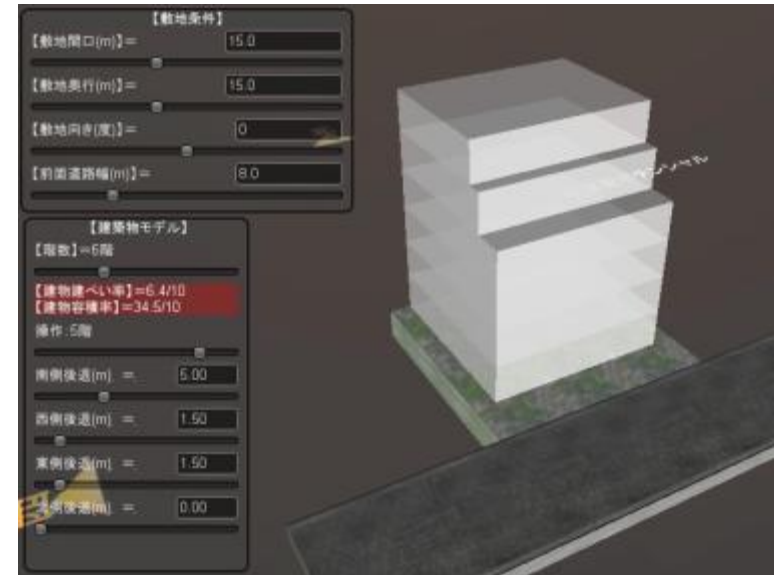
図22. 北側斜線勾配=1.25 立上り距離=10m



Buildable space

【Coverage of building space】

C : 建ぺい率; B_{E1} : 第1階東側後退距離 (m);
 W : 敷地の間口 (m); B_{W1} : 第1階西側後退距離 (m);
 D : 敷地の奥行き (m); B_{N1} : 第1階北側後退距離 (m);
 B_{S1} : 第1階南側後退距離 (m)。



Buildable space

【Floor area ratio of parcel】

R : 容積率; B_{Ek} : 第 k 階東側後退距離 (m);
 n : 階数; B_{Wk} : 第 k 階西側後退距離 (m);
 T : 外壁の厚さ (m); B_{Nk} : 第 k 階北側後退距離 (m);
 B_{Sk} : 第 k 階南側後退距離 (m)。



Automatically reshaping the buildable space based on regulations

本機能は、最大の**屋上面積**を求めるために、複数の斜線規制(道路斜線、隣地斜線、北側斜線)が適用される場合、建築できる最大な建築物モデルを自動計算できる補助機能である。

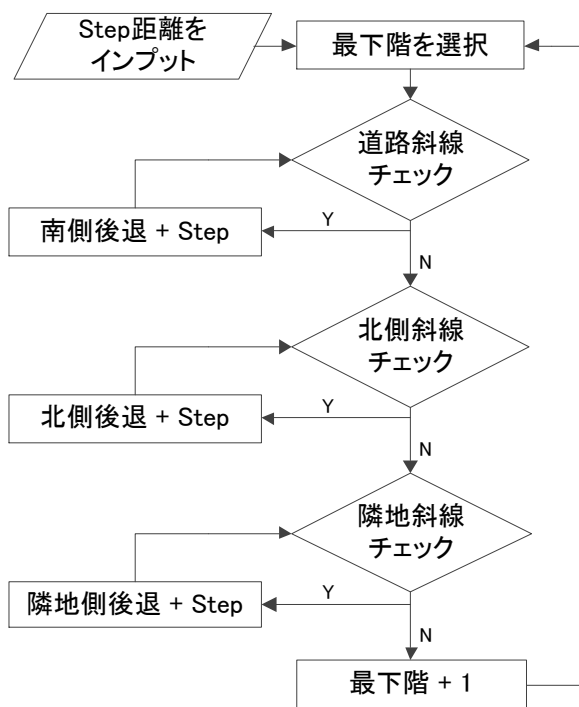
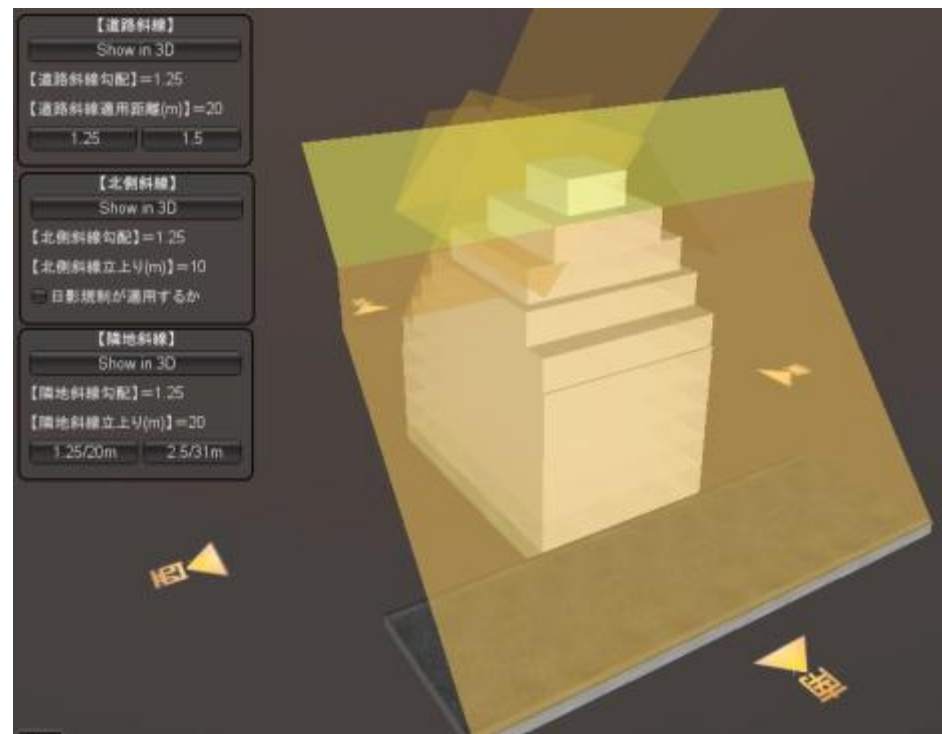


図24. 自動計算機能のフローチャート



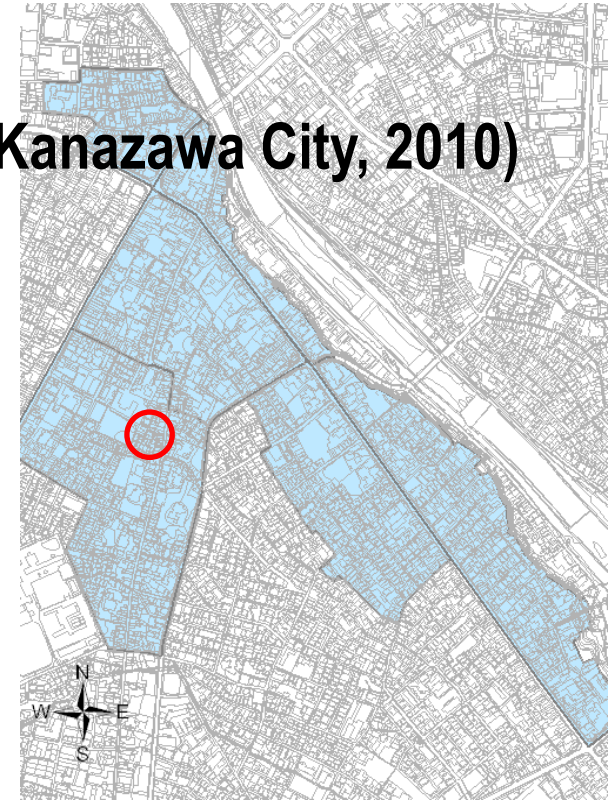
Auto shaped buildable space



A learning tool for studying modified regulations (Kanazawa City, 2010)

- Teramachi is a densely built-up area with traditional buildings and historical road patterns
- Narrow roads with a zigzag pattern that effect on evacuation route and fire-prevention
- Impossible to rebuild because of planning regulations such as oblique line, FAR limitation of frond road in Building Standards Act

It is difficult to rebuild based on current Building Standards Act. However, residential environment need to be improved.



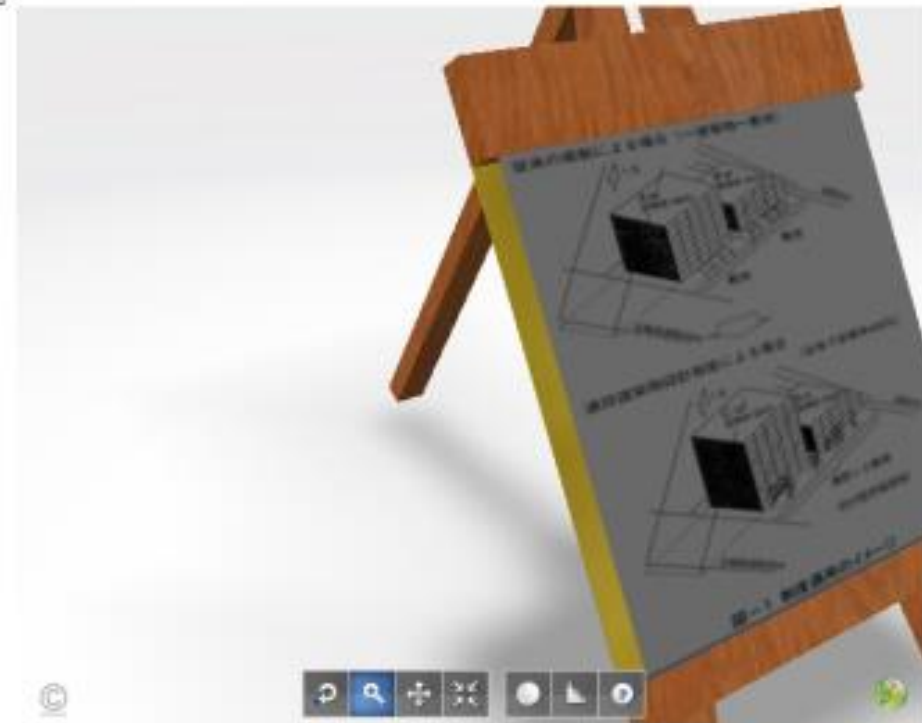


Regulations presented on panels



Users can prepare their digital assets after he/she register an account using 3DVIA

Users can prepare VR world using the digital assets within his/her database



Description [Stats](#) [Embed](#) [Gallery](#)

Uploaded by kubw11 04/02/2012 14:35:07



★ ★ ★ ★ ★ (No ratings)

[Send To](#) - [Edit](#) - [Download](#) - [Flag](#) - [Report Problem](#)

[Like](#) Be the first of your friends to like this.

Comments [Subscribe](#)

Say something!

[Post Comment](#)

Tags

[Add Tags...](#)

Groups

No groups

[Add to a group...](#)

Textures

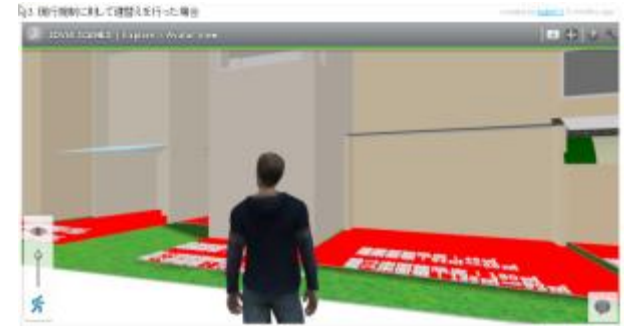
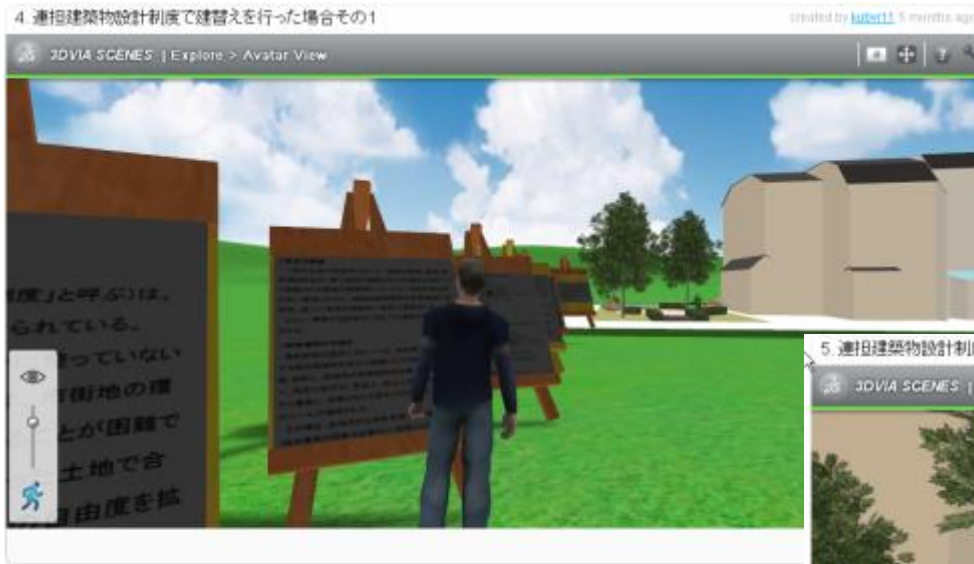


[view all...](#)

It is a digital object for explanation planning regulation.



Multi-user environment for studying


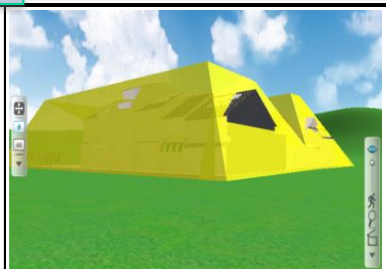





**VR world for planning learning
and communication within multi-
user environment**

設計制度を適用して建替えを行った場合の空間の2つ目ですが、これは家を丸ごと別の場所に移動させるなど現実的には難しいパターンです。しかし、街区の中に commonspace を設けるなど理想的な空間を再現しています。



Learning process of modified regulation on buildable spaces

Current townscape	Illegal parts based on general BSA	Rebuilding based on general BSA	Planning measure I	Planning measure II
				

Separated parcels

Planning Solution: All parcels are united as one parcel

Current Situation

Buildable Form in Yellow
Color based on oblique line

Not change the site layout

Change the site layout

Find out the illegal parts based on BSA

Buildable form based on set-back requirement from the front roads

Possible to rebuild based Special design code (e.g. oblique line can be withdrawn)



◆ A learning tool for studying Traditional Townscape design

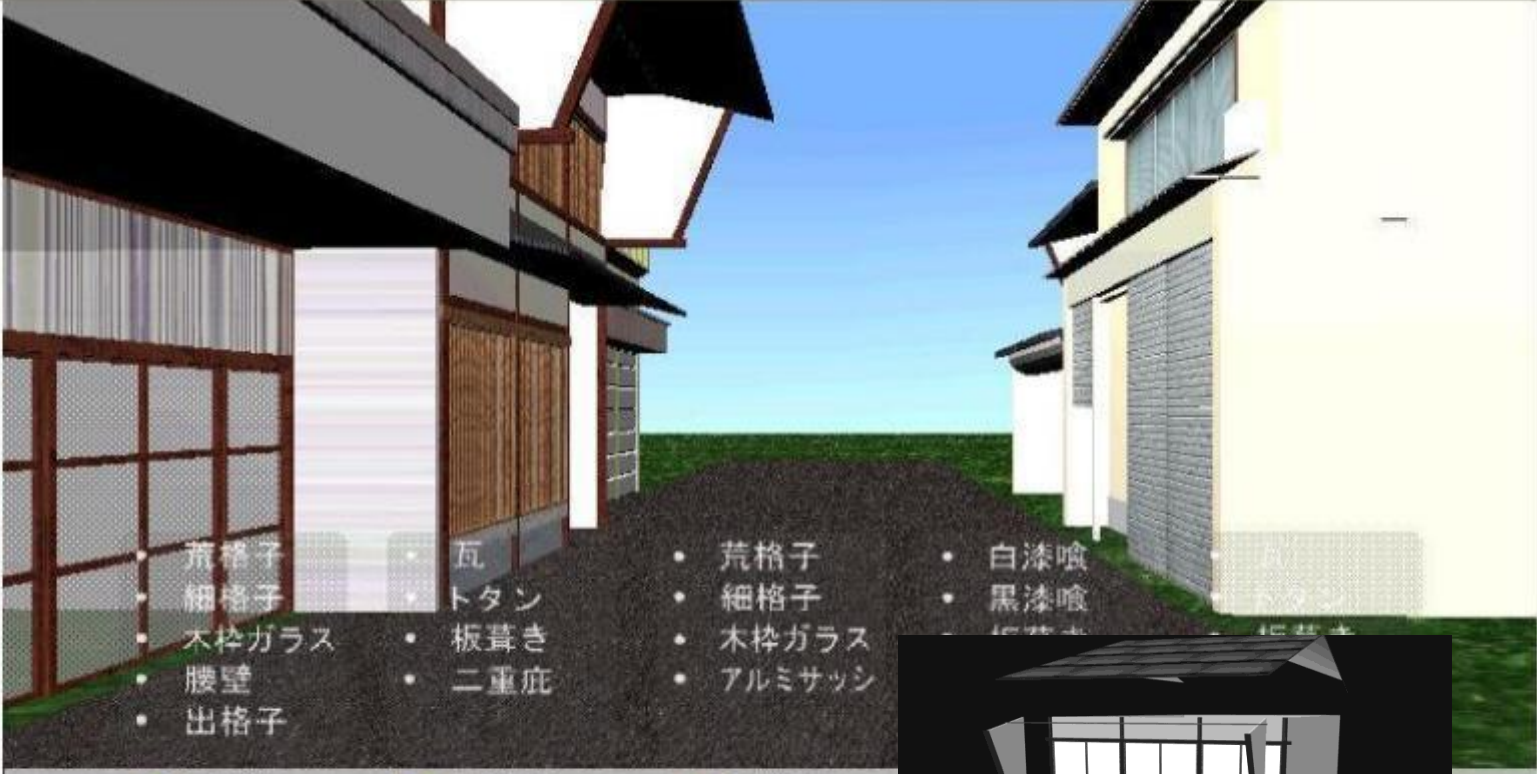
(Kanazawa NPO, 2006)

★ お気に入り blaxxun interactive - CCpro

This page is an example for design decision-making regarding a restoration plan in historical area.

For access this site, you need a plugin for IE browser. Please download from the following site.

[Blaxxun download](#)



- 荒格子
- 細格子
- 木枠ガラス
- 腰壁
- 出格子
- 瓦
- トタン
- 板葺き
- 二重庇
- 荒格子
- 細格子
- 木枠ガラス
- アルミサッシ
- 白漆喰
- 黒漆喰

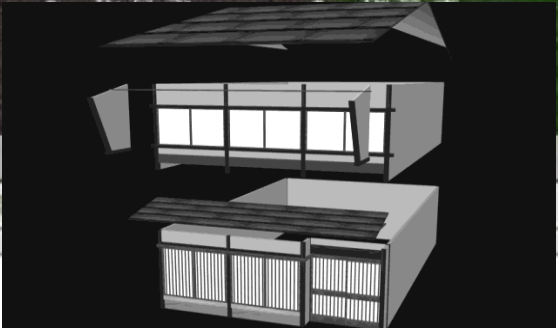
1階表 1階庇 2階窓

Public blaxxun interactive 3 / 7 People 10

Nickname

- 10 GB
- 10 kanazawa univ
- 10 MK

kanazawa univ : hi GB!
GB : this SharedObject is so nice!!!!
kanazawa univ : thank !! where are you from??
GB : I am from israel





外観軸組み (フレーム)



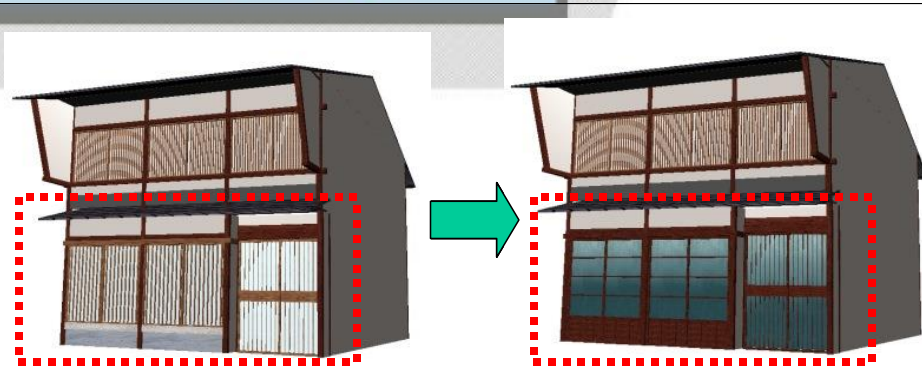
+

=

意匠要素 (パーツ)



町家の表構え





Researches 2001-2010 Learning tools for studying

- Planning regulations**
- Modified planning regulation**
- Townscape design**

which are supports by JSPS,

Kanazawa City and Kanazawa NPO



Presentation for Planning and design

Planning learning

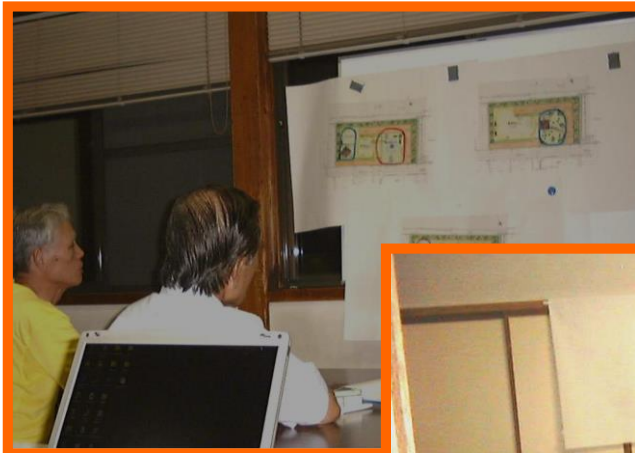
Planning & design proposal

Deliberation and Planning review

Cloud-based Virtual Reality and Planning support



◆ A design tool for making design proposal from residents
(Kanazawa, 2001)



Conventional planning meetings



◆A street park project (Kanazawa City, 2001)

The screenshot displays a web-based VRML design collaboration environment. At the top, two browser windows are visible: one titled "Design tool" and another titled "VRML". The main content area features a 3D perspective view of a park design, showing a paved walkway, a red slide, and blue swings. To the right of the 3D view is a registration form for a chat room, with fields for "登録名" (Registration Name) and "メールアドレス" (Email Address). A vertical notice on the right side of the form reads "必要 差し支えなければお書きください" (Required: Please write if it does not cause any trouble). Below the form are buttons for "登録" (Register) and "入力しなさい" (Please enter). At the bottom of the interface, the text "VRML DESIGN COLLABORATION" is prominently displayed. The browser's address bar shows "http://websevr.ca.kanazawa-city.jp/~design/".



ICON Game, Kanazawa city

USERS' DESIGN INTERFACE
FOR PUBLIC PARTICIPATION OF PARK DESIGN

SAVE YOUR DESIGN TO WEB DATABASE

SAVE YOUR COORDINATES INFORMSTION
(INPUT YOUR LOGIN NAME AND PUSH SAVE
BUTTON)

login name:

SAVE cancel

designed by katagishi

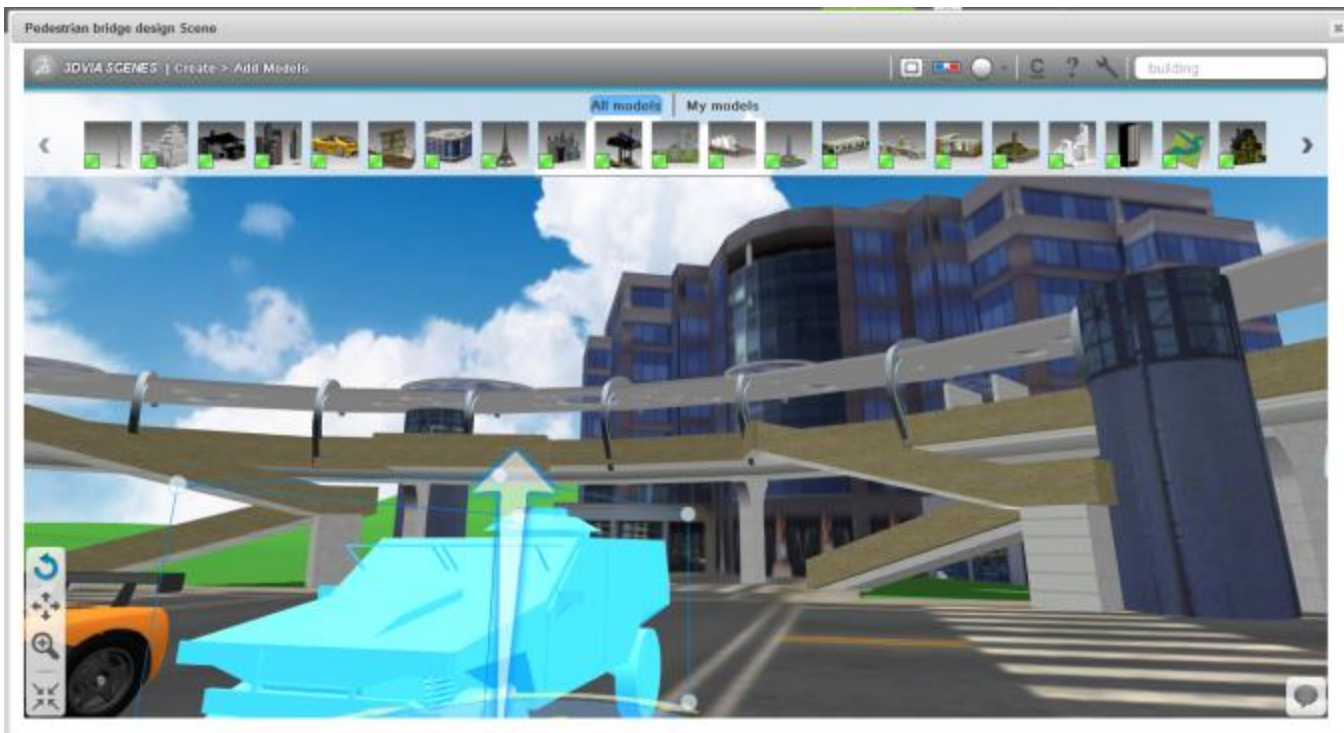


Design Representation using VRML





◆ An elaborated design tool using 3Dvia in Urban Space (KULab, 2011)





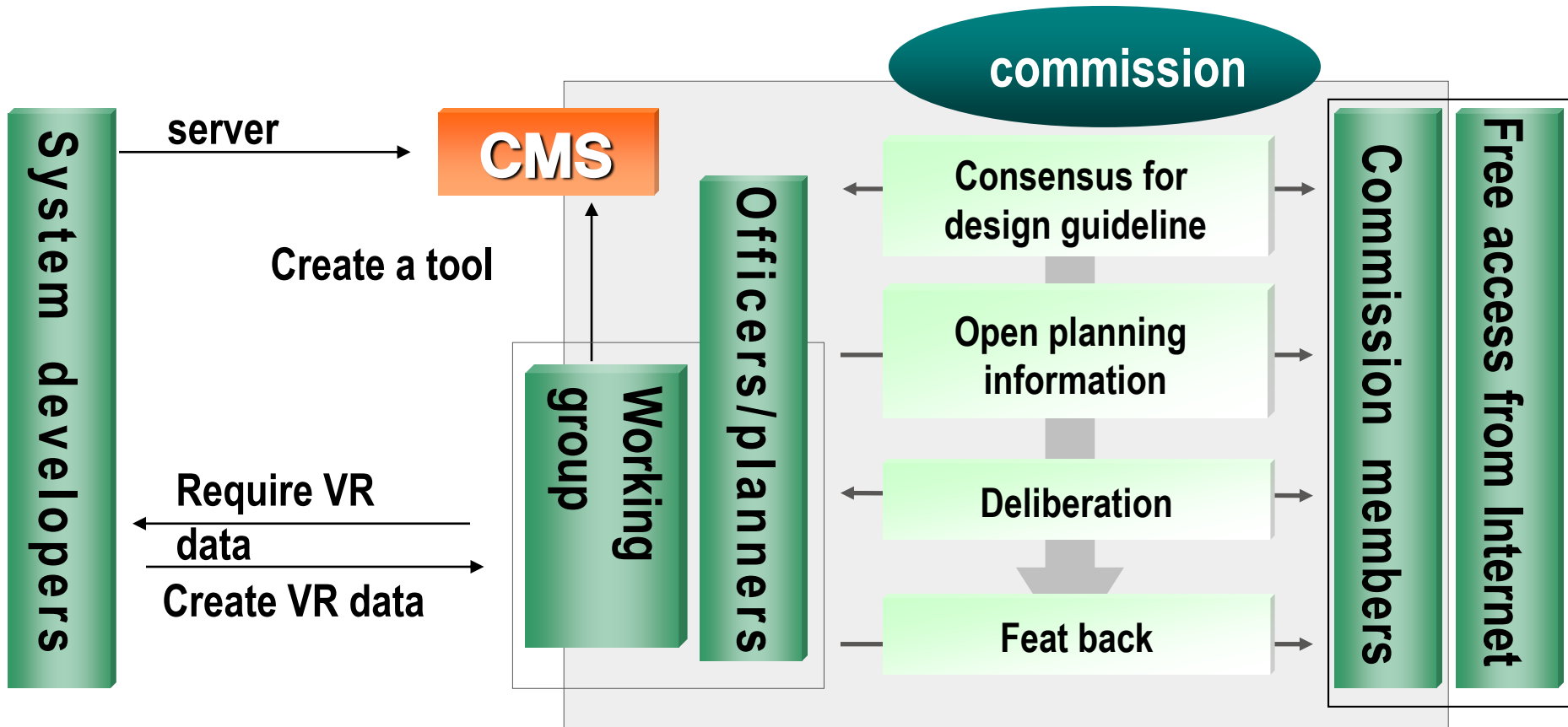
Presentation for Planning and design

Planning learning

Planning & design proposal

Deliberation and Planning review

Cloud-based Virtual Reality and Planning support



The working group of a committee can create a visualization tool with the help of system operators.

Deliberation and Planning review



Access from a meeting



Access from home

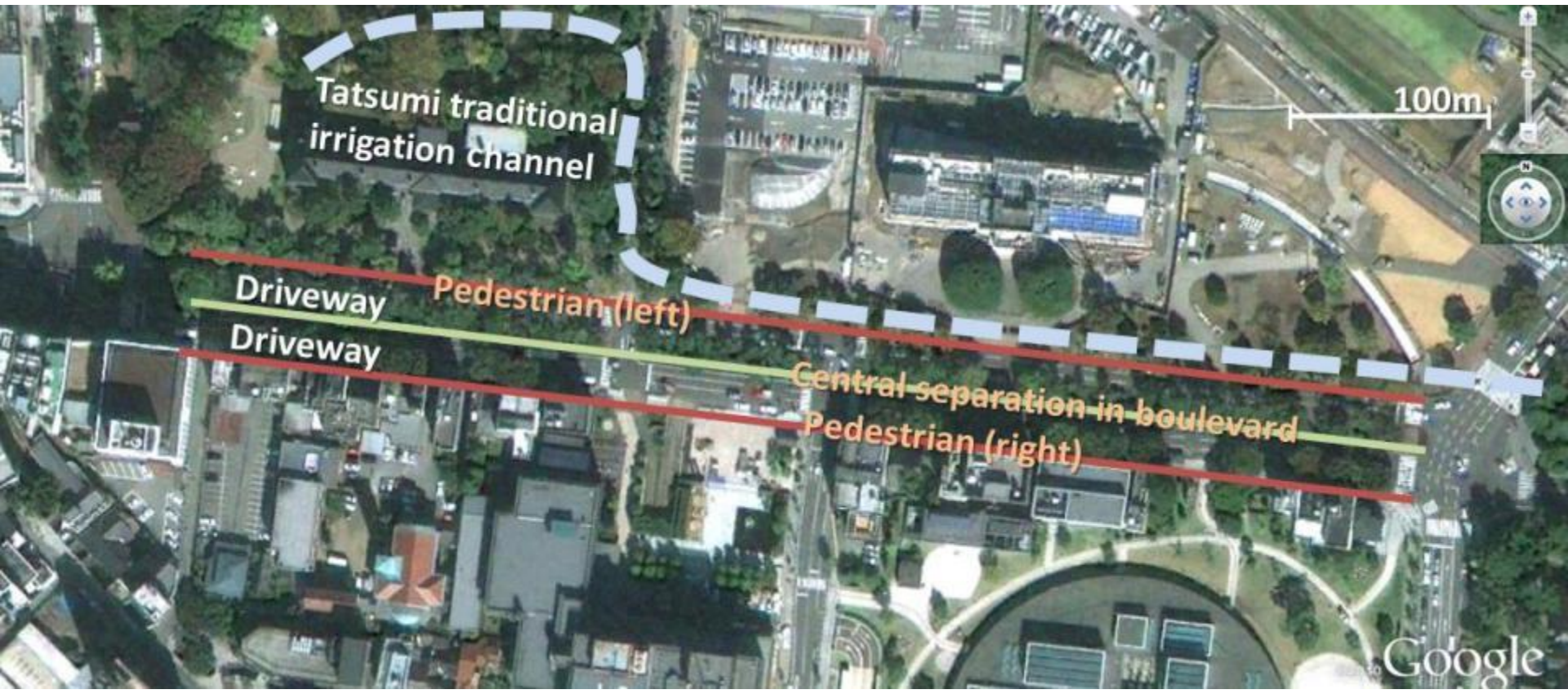


Access from public facilities





◆ A Design meeting System for deliberation (Ishikawa, 2002)





Alternative plans

Audio file

Text description

④辰巳用水

【A案】

【B案】

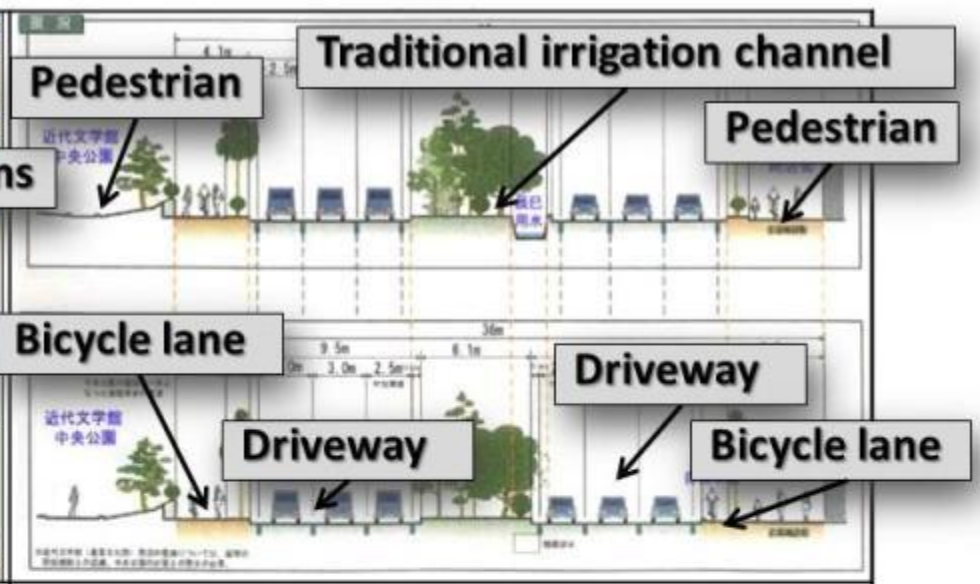
参考資料

※近現代文学館前では、用水は中央公園内に導水します。
⇒ 歩道(県庁跡地側)から用水を汲み取られます。

2. 用水の幅 ⇒ 現状維持

(1) 用水の幅は、今と同じ(2m)です。

(a) Text and audio descriptions



(b) Planning drawings (road section)



(c) Planning drawings (pedestrian and bicycle lane)



(d) The plan represented by VRML

Deliberation and Planning review



The image shows a composite of several browser windows from the early 2000s. The windows are arranged as follows:

- Top Left:** A window titled "A案のVRML" showing a 3D street scene. A callout box labeled "Alternative plan A" points to the scene. Below the scene is a text box labeled "[A案]".
- Top Right:** A window titled "A案について" showing a 2D architectural plan. A callout box labeled "Plan information C" points to the plan. Below the plan is a text box labeled "[C案]".
- Middle Left:** A window titled "C案のVRML" showing a 3D street scene with a person walking. A callout box labeled "Alternative plan C" points to the scene. Below the scene is a text box labeled "[C案]".
- Middle Right:** A window titled "計画デザイン会議室" (Planning Design Meeting Room) showing a BBS interface. A callout box labeled "Open BBS" points to the interface. Below the interface is a text box labeled "Deliberation using BBS".
- Bottom Left:** A callout box labeled "Audio explanations" points to a small text box in the "C案のVRML" window.
- Bottom Center:** A callout box labeled "Open VRML" points to a button in the "A案について" window.



◆A Design meeting system for townscape design guideline (Ishikawa, 2004)

Location
symbol street in Nanao City

project
urban Renaissance project of Nanao City

Plan
widening of road、
building reconstruction
readjustment of lots

Committee
Residents : 10 experts : 4
planners and officers : 8
Facilitator : 1



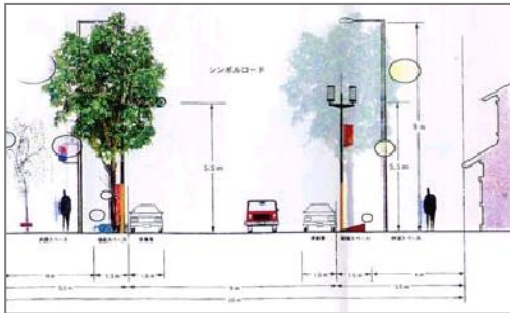
Project site



SIMULATION DESIGN GUIDELINE OF TOWNSCAPE DESIGN PROJECT

Cross-sectional composition of street

Position and width of driveways, sidewalk and etc.



Design of street furniture

Roadside trees, tree planting pot and others in sidewalk.



Design of buildings

Architectural style and other accessories of buildings.





Exchanging planning alternatives dynamically in real time

Exchanging alternatives using VR

- Street furniture
- Land use
- design of buildings
- FAR limitation of buildings

For gaining consensus
Of design guideline

The VR background is kept
unchanging



Only the items for deliberation
will be replaced

(A case study in NANAŌ city)



図2 カツラ (秋) の場合





Examination of the simulated scenes about the land use



(a) Supposed houses in each site



(b) Supposed building in larger site

Examination of others such as gate, fence, etc.,



(a) No gate exist



(b) Installation of gates



Examination of the simulated scenes about roadside trees



(a) Japanese Judas tree (Spring)



(b) Japanese Judas tree (Autumn)



(c) Chestnut (Spring)



(d) Chestnut (Autumn)

Deliberation and Planning review



Design review codes (Authorization of local planning committee is necessary before construction)		Necessity	Consideration in design
A	A1	Roof shape 1)Sloping roofs of an angle around 4.5 in 10.	Yes
		2)Parallel to the road	Yes
	Front façade	1)Traditional painting and traditional windows design	Yes
		2)Natural materials (wood and brick)	Yes
A2	Color of exterior wall 1)Harmony with the colors of natural materials	Yes	
	2)The brown, beige color or white and black design if no using of natural materials	Yes	
	3)Only black using for roofs	Yes	
B1	Green spaces	Yes	
B2	Shopping store in the 1st floor	Yes	
	Show windows facing to the road	Yes	
	Easy for tenants to open stores if owners do not open stores	Yes	
B	No adult entertainment shop	Yes	
	B3	Advertisement considering townscape 1)No other advertisement beside owners' advertisement	Yes
		2)Advertisements stand under the eaves	Yes
		3)Design for covering air condition and other machines	Yes
4)No parking spaces occupying pedestrians road		Yes	

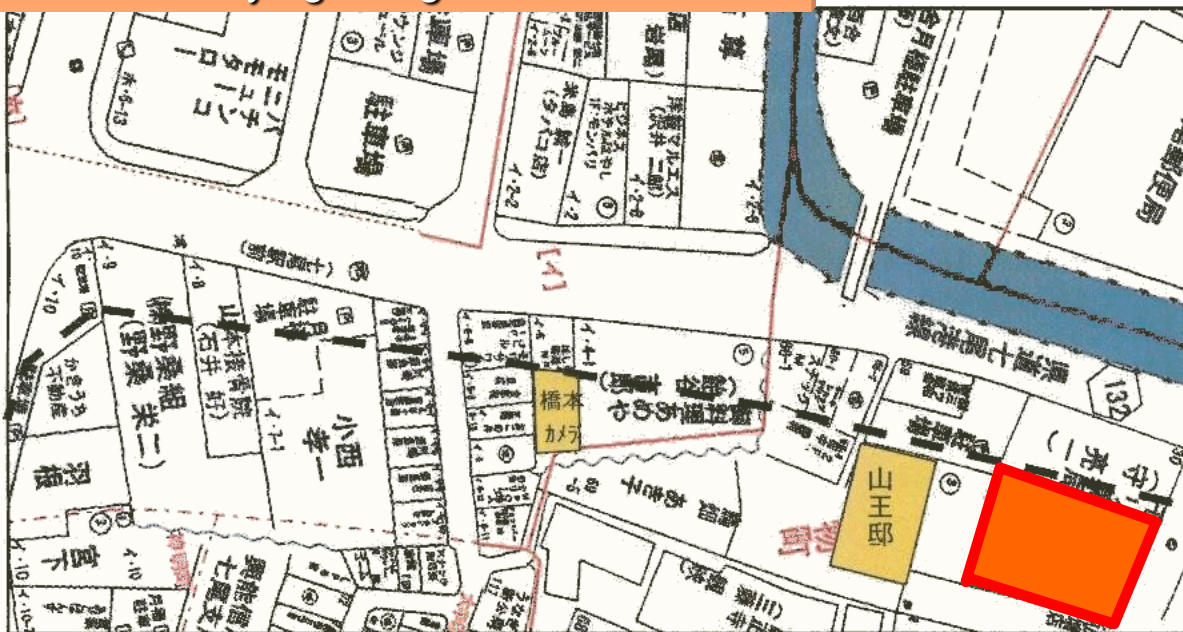
●The design guideline regarding private buildings Even though we can visualize them, the residents are offensive with the alternatives open to public.

● For gaining consensus, some movies or pictures are shown, but no visualization of each private building is conducted for townscape.



◆ A Design Review tool for design review meeting (Nanao, 2006)

A case studying using visualization tool



今年度対象だった3物件の位置図

Mori drug store (2006.6.26~2006.7.20)

**Design review meeting for private building
(VR+BLOG+CHAT+BBS)**



Problems solved for free access on the WEB

- 1) Shared common image between participant
- 2) Comments and free discussions using BBS or chat and blog comments.

For commission meeting

- 3) Change the design options in real time.

However, it is still difficult for private properties in practice

- 4) It is difficult for owners of private buildings to have open discussion about their private properties.

Planning Commission Meeting

(VR+BLOG+CHAT+BBS) – any new tools? 3Dvia? VRCloud? Google?



As a case study

- 1) Visualization tool is useful to the design and planning of public space.**
- 2) Even though the private information is difficult to be open to public, the design review process for their building reconstruction is available to check whether the design is match with design guideline or not.**
- 3) After design review of each reconstruction can be open on the Internet for all residents in project areas.**
- 4) It is useful to organize the information technology to a PSS tool according to different requirements from different urban projects through analysis of their planning process in practice.**



Presentation for Planning and design

Planning learning

Planning & design proposal

Deliberation and Planning review

Cloud-based Virtual Reality and Planning support

Cloud-based Virtual Reality and Planning support



Service

生活サービス

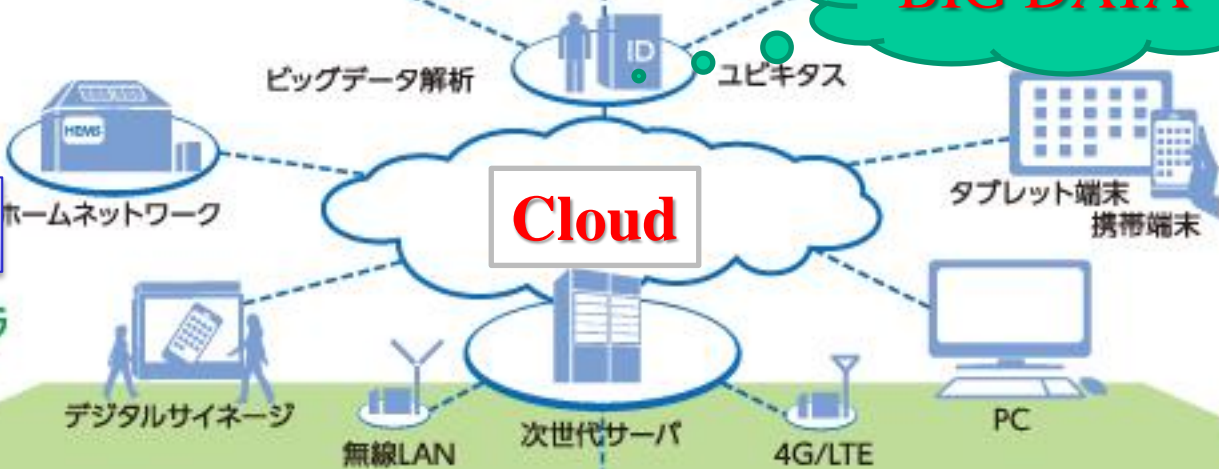


データの見える化 ソーシャル・ネットワーク スマート家電



Smart infra

スマートインフラ



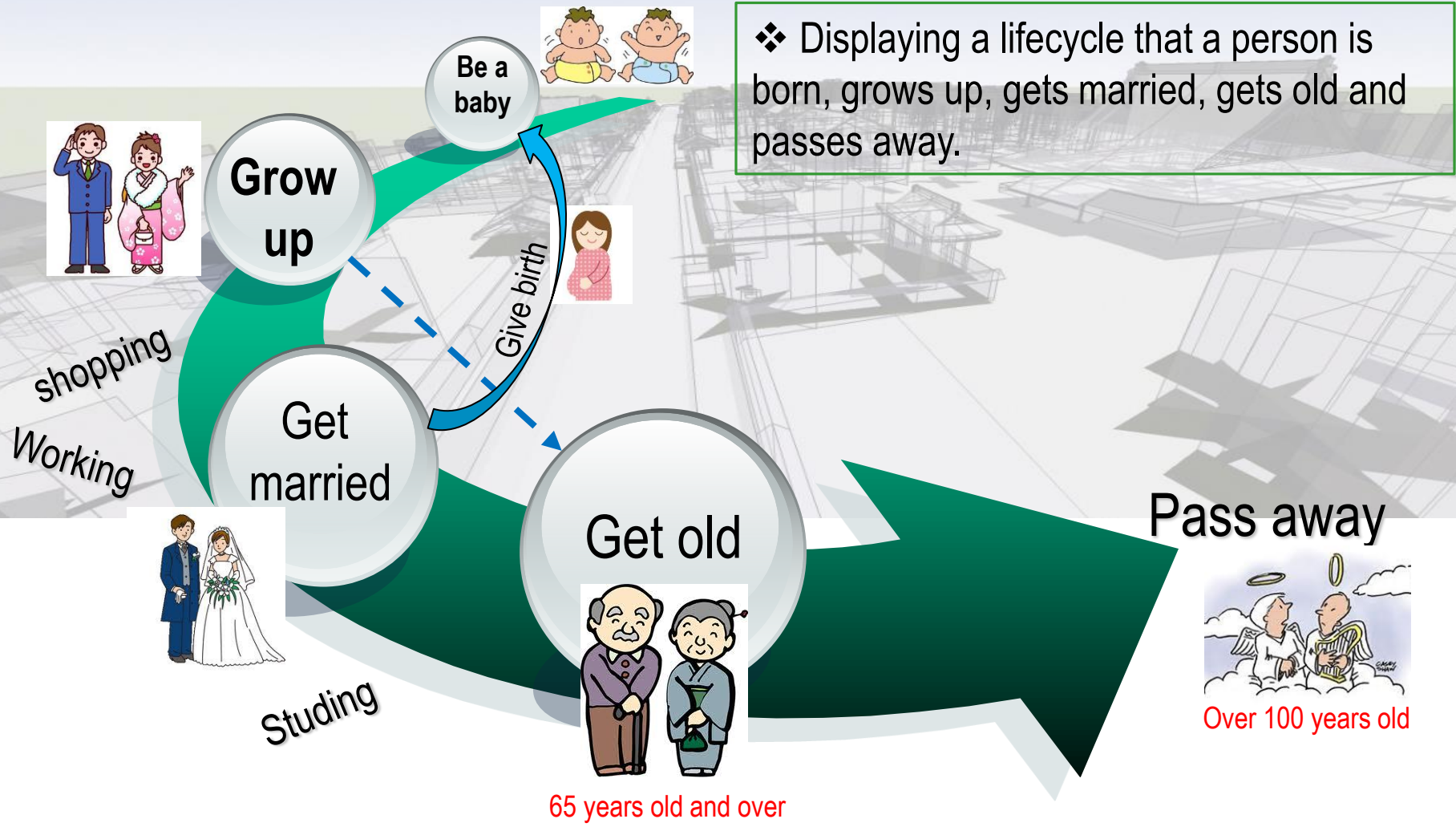
Urban Infra

基礎インフラ





◆ BIG DATA in Urban Space





A Smart Planning Tool for Population and their housing location choices (Ishikawa, 2010-2013)

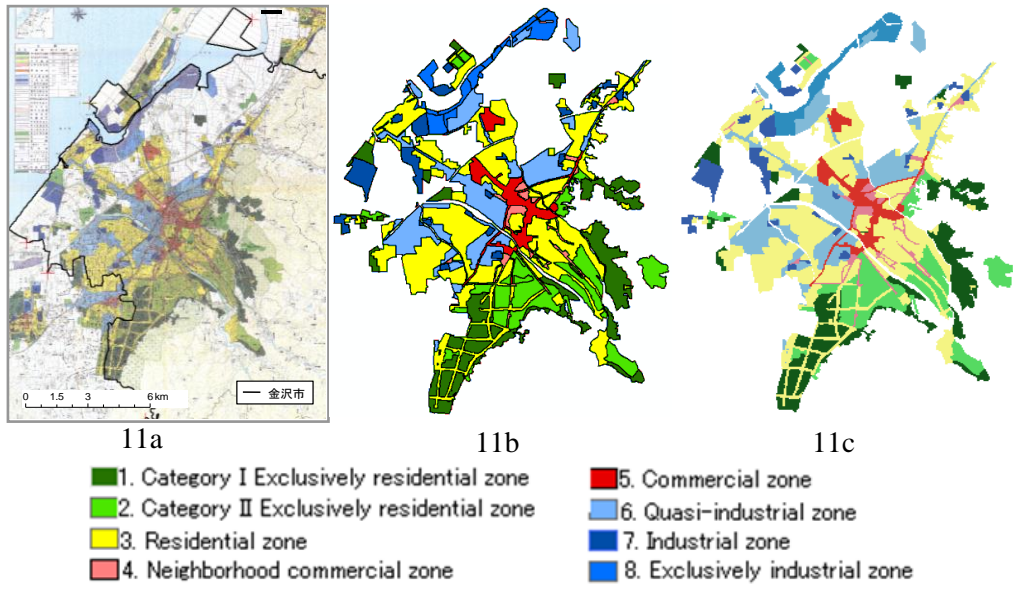


Fig.11- Land use zoning in 1985.

a) paper map, b) Data in GIS, c) Data in Netlogo

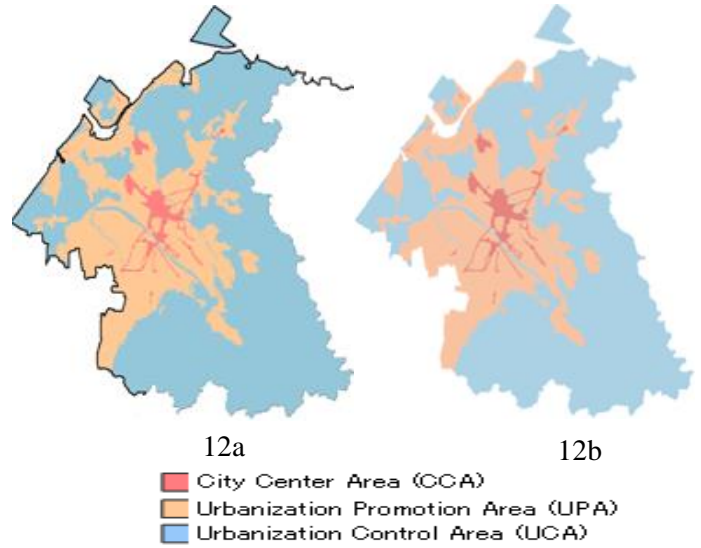
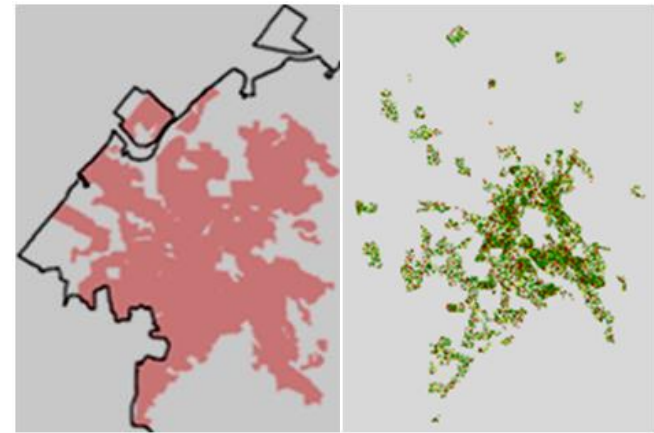


Fig.12- Urban areas in 1985.

a) Data in GIS, b) Data in Netlogo

Fig.13- Household distribution.
 a) Household distribution in Kanazawa City,
 b) Distribution of 6825 households with 3 different kinds of income



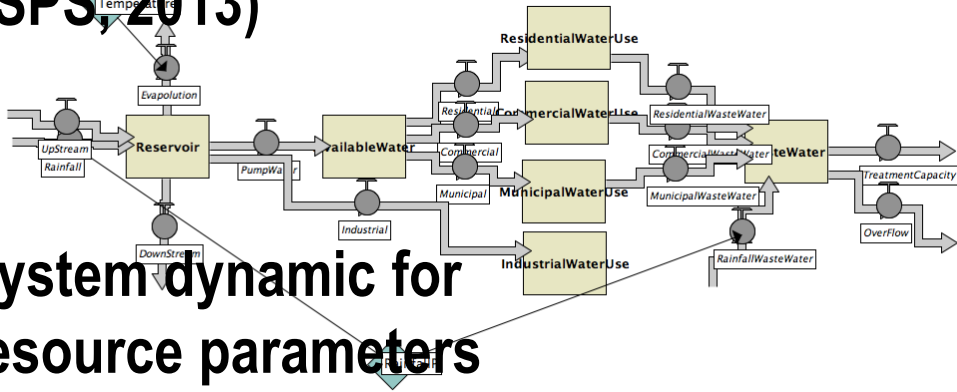
13a

13b

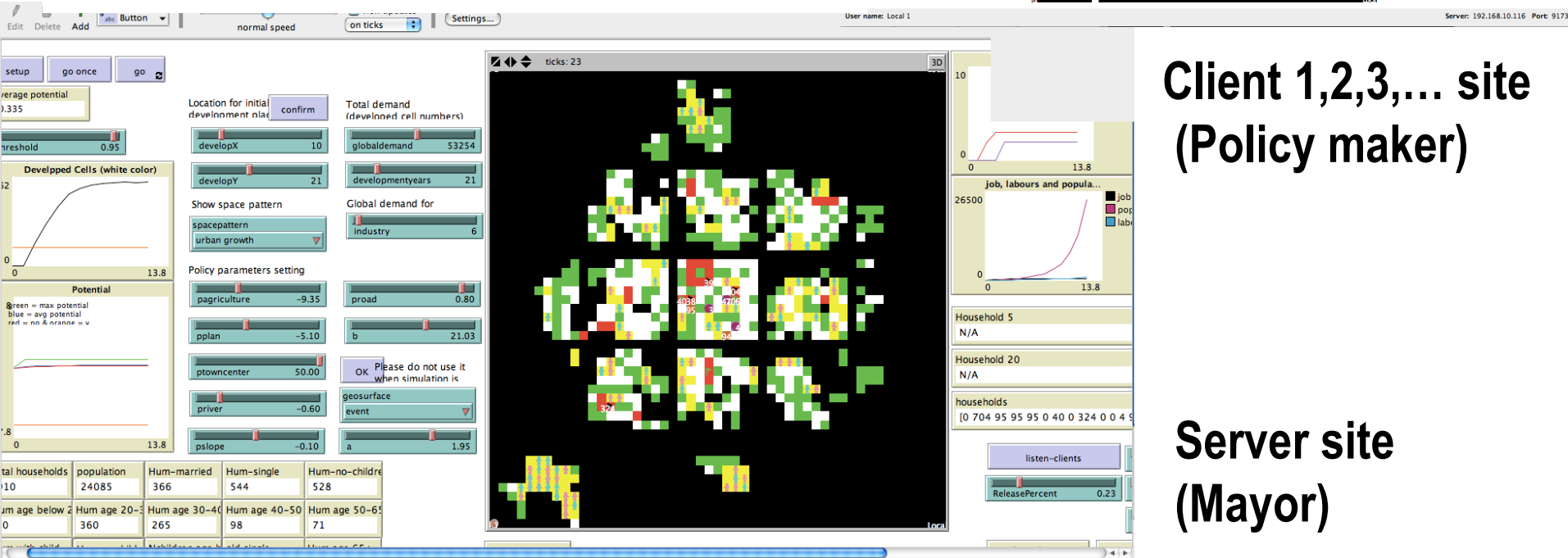
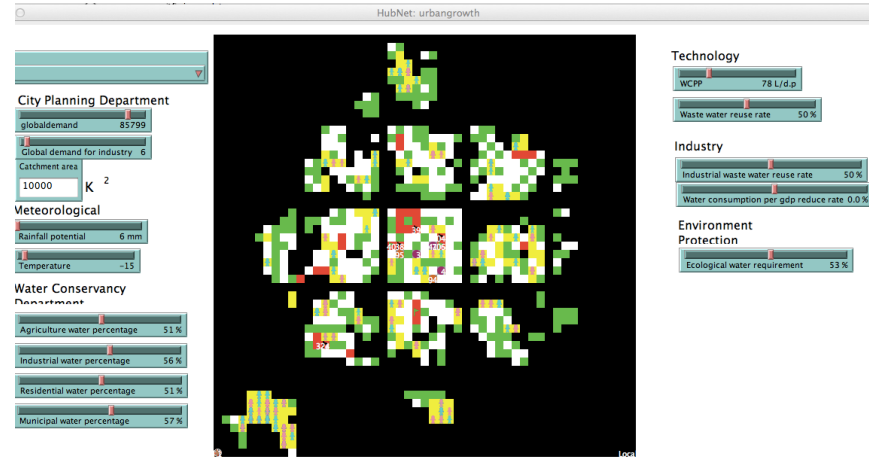


Cloud-based Virtual Reality and Planning

◆ A Smart Planning tool for decision-making of urban growth policy (JSPS, 2013)



System dynamic for resource parameters

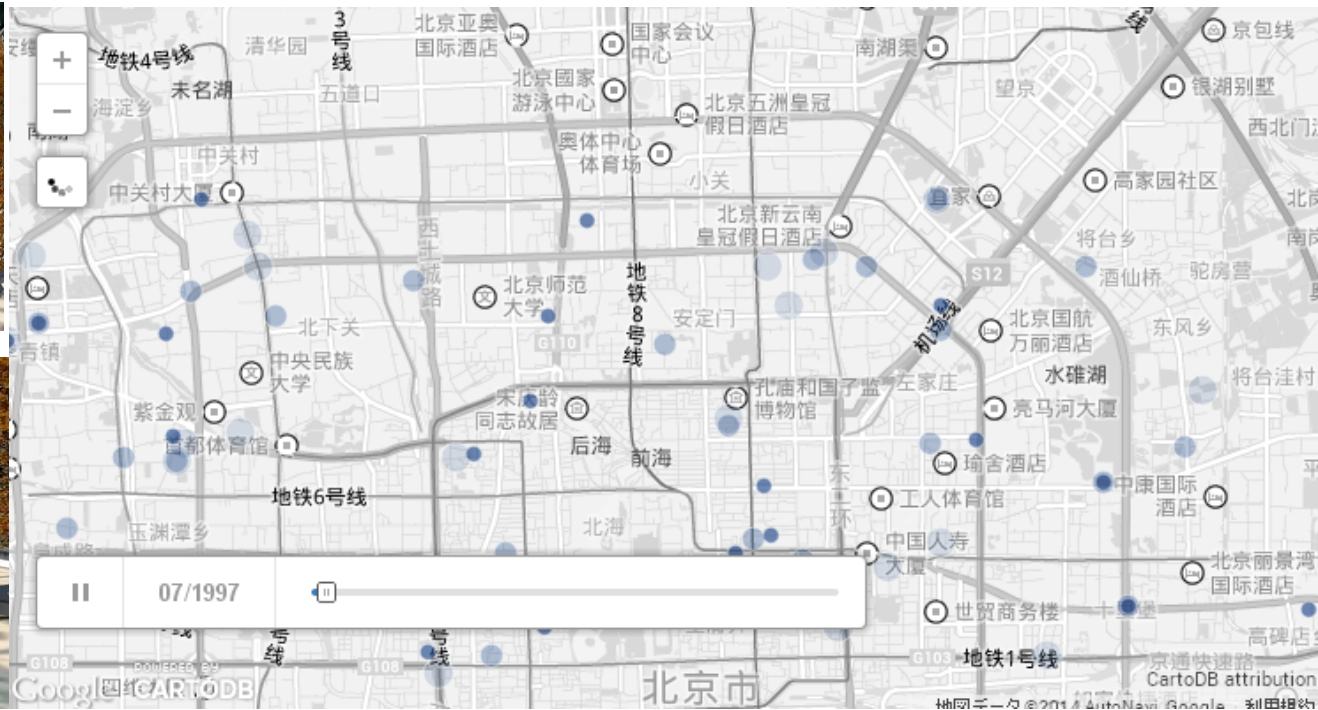
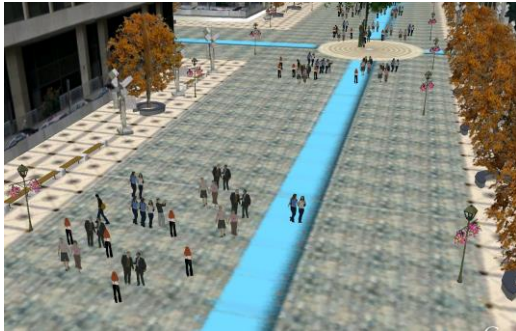


Client 1,2,3,... site (Policy maker)

Server site (Mayor)



◆ BIG DATA for Urban Design of Public Space

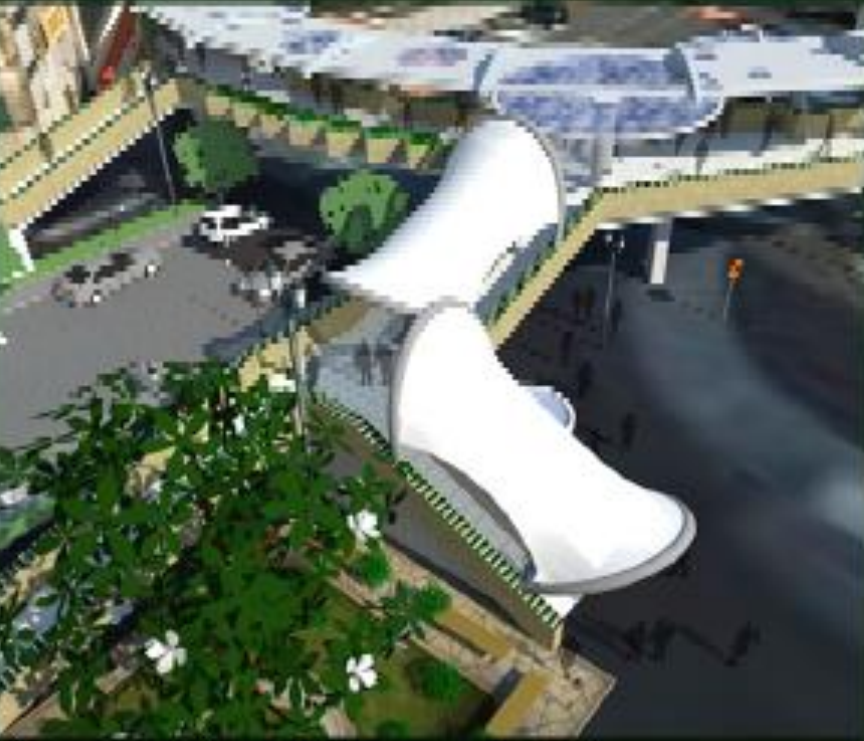


- ❖ How people move in urban space?
- ❖ Check-in data, cell phone with GPS, Traffic Card

Cloud-based Virtual Reality and Planning support



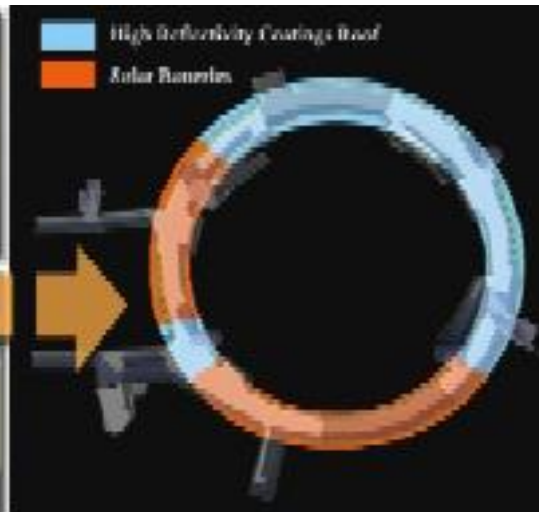
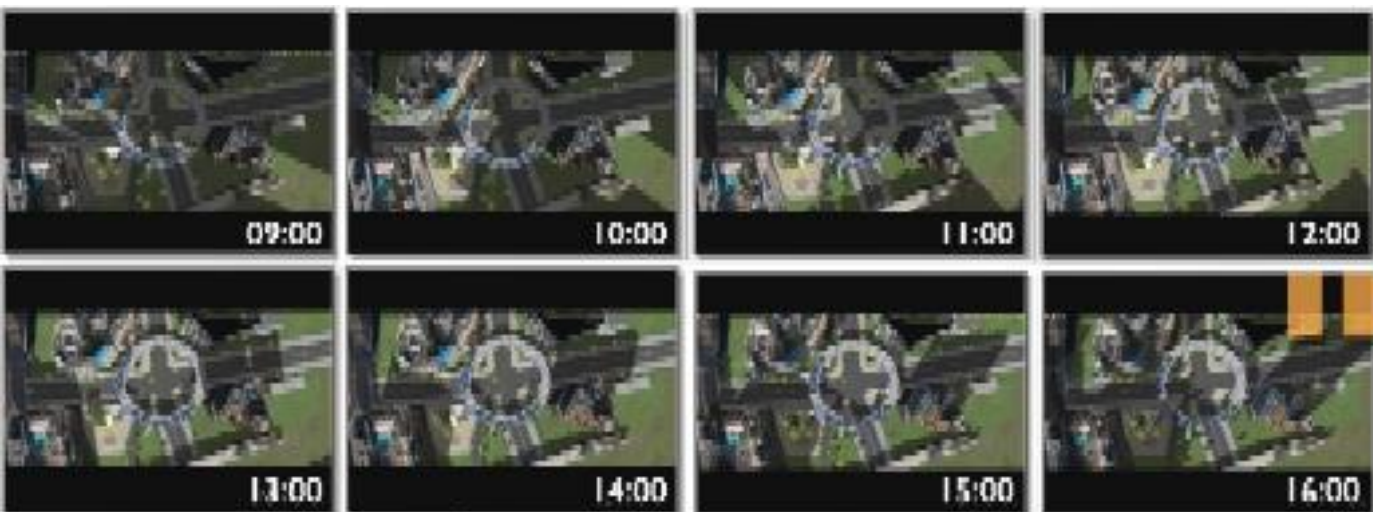
Virtual Design
World Cup Award
(Zhenhan, LEI in
KU)





◆ BIG DATA + VR Cloud is possible using the platform of Forum8

- ❑ Big data reflecting the tracks of people and car moving
- ❑ Input to UCWIN/Road
- ❑ Visualizing the car and people



Cloud-based Virtual Reality and Planning support



	VR Cloud (In KU)	Google Earth	3DVIA
<i>Sever side</i>			
VR Sever	Application server	Application	Http-based application server
Server management	Standalone (Specified IP address)	Cloud server	Cloud server
<i>VR Database</i>			
Dataset	KMZ created in SketchUp	KMZ created in SketchUp	KMZ created in SketchUp
VR objects	Prepared and imported	Prepared and imported Possible to use online data warehouse	Composed on-line using 3DVIA tool and possible to use online data warehouse
VR data editing	Impossible	Impossible	Direction, position and scale
Design alternatives	Prepared	Prepared	Possible for user to adjust
Data range	Planning site only	Global	Planning site only
Surrounding data	No	3D warehouse	3D warehouse

Cloud-based Virtual Reality and Planning support



	VR Cloud (In KU)	Google Earth	3DVIA
<i>Functions of the VR server</i>			
VR Navigation	Predefined and freely walkthrough	Freely walkthrough	Predefined and freely walkthrough
Communication	No (QQ)	No (QQ)	Chat
Avatars	Car and person can move based on predefined scenarios	No	Avatars on behalf of real users
Sound Environ.	Car noise	No	No
<i>Total evaluation</i>			
SaaS	VR representation and simulation.	VR representation	VR representation and communication with avatars
System Developer	Difficult	Easy	Easy
Planer	Comprehensive	Simple	Middle



◆ BIG DATA in the three platforms

	<i>Volunteer Text</i>	<i>Movie</i>	<i>Photo</i>	<i>Person</i>	<i>Car</i>
❖ Google Earth	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>	<i>No</i>
❖ VR-Cloud	<i>No</i>	<i>No</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>
❖ 3DVia	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

- ❖ Google Earth can be social network for collecting multi media data as BIG DATA
- ❖ VR-Cloud is possible to import big data for VR simulation.



Cloud-based Virtual Reality and Planning support

Planning support system in future

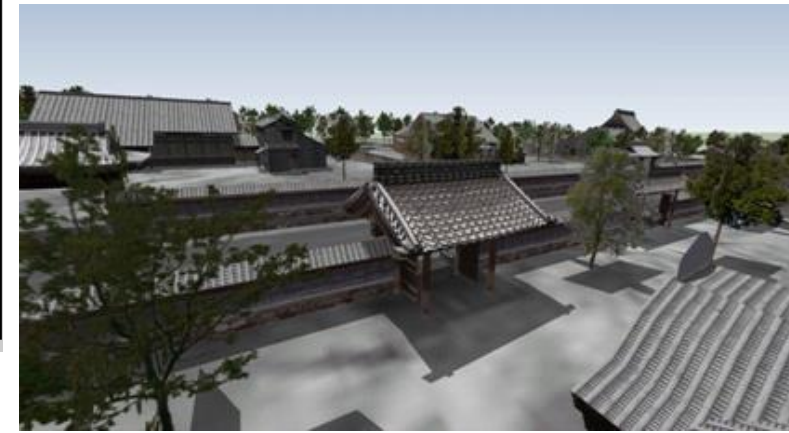
Traffic



を適用して建替えを行った場合の空間のつめです。道路(行き止まりの道路)を解除し、災害時の二方向避難を可能にしました。また、制度適用により容積率に余裕ができて、3階建ての実現が可能になりました。さらに空地にコンクリートスペースを設けることで住民間の交流などが期待できます。

Policy-making + Planning + Design

Urban design



- Housing Density**
 - Favour houses with yards
 - Maintain current mix
 - More compact growth
 - Mostly compact growth
- Housing Location**
 - City edges, low density
 - City-wide, medium density
 - City core, high density
- Job Location and Density**
 - City edges, low density
 - City-wide, medium density
 - City core, high density
- Roads and Transit**
 - Favour roads and drivers
 - Mix of roads and transit
 - More transit
- Energy and Air**
 - Remove programs
 - Maintain programs
 - Improve programs
 - Achieve best practices
- Water Use and Solid Waste**
 - Remove programs
 - Maintain programs
 - Improve programs
 - Achieve best practices



Suburban

Urban Residential

Sprawl

< less more >

Commuter Time

Transportation Mix

Regional Budgets

Water Use

Solid Waste

Air Quality

Eco-Footprint

Show Guelph boundaries

Show Major Roads and Transit Hubs

Zoom

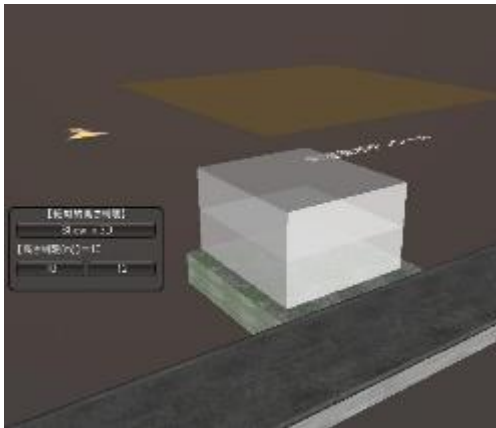
Out In

Animate Map Over Time

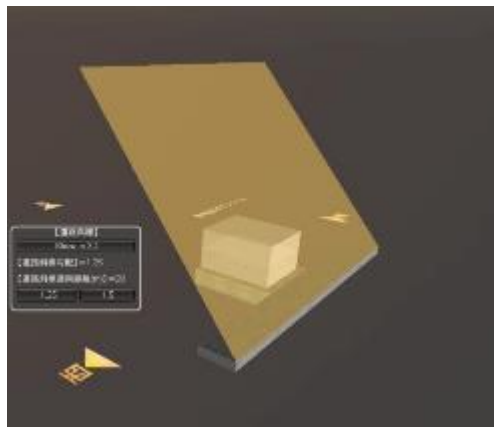
Land use



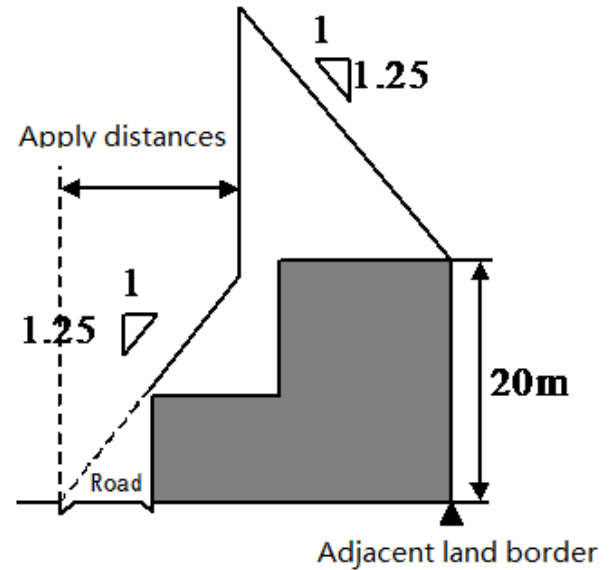
Buildable space based on planning regulations



Height Control



Slash Control



Morphology Control



Buildable space based on planning regulations

Image of the tool

あなたは 街区1について 第一種中高層住居専用地域
 街区2について 第一種低層住居専用地域 を選択しました。
 街区3について 第二種中高層住居専用地域

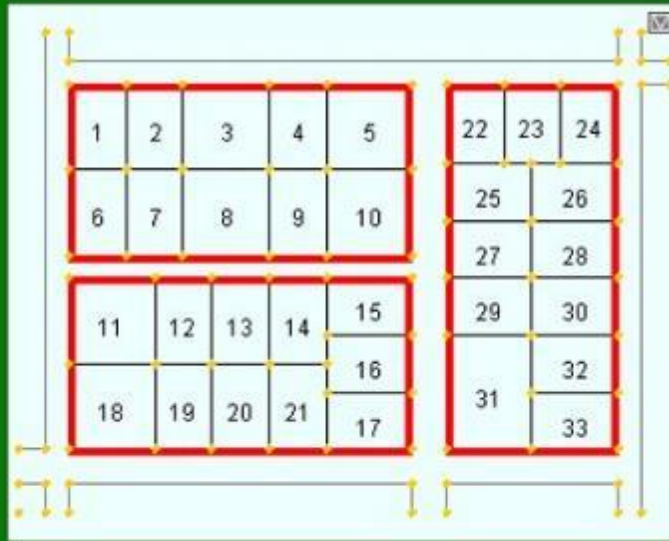
下で各街区の条件を入力し、を押して下さい。用途を選択し直す場合は
 この部分は選択可能⇒ この部分は選択できません⇒

街区1について	街区2について	街区3について
容積率／建蔽率 <input type="text" value="200/60"/>	容積率(%)／建蔽率(%) <input type="text" value="50/30"/>	容積率／建蔽率 <input type="text" value="200/60"/>
外壁の後退距離(m) <input type="text" value="規制なし"/>	外壁の後退距離(m) <input type="text" value="0"/>	外壁の後退距離(m) <input type="text" value="規制なし"/>
絶対高さ制限(m) <input type="text" value="規制なし"/>	絶対高さ制限(m) <input type="text" value="10"/>	絶対高さ制限(m) <input type="text" value="規制なし"/>
道路斜線適用距離(m) <input type="text" value="20"/>	道路斜線適用距離(m) <input type="text" value="20"/>	道路斜線適用距離(m) <input type="text" value="20"/>
道路斜線勾配 <input type="text" value="1.25"/>	道路斜線勾配 <input type="text" value="1.25"/>	道路斜線勾配 <input type="text" value="1.25"/>
隣地斜線立ち上がり(m) <input type="text" value="20"/>	隣地斜線立ち上がり(m) <input type="text" value="規制なし"/>	隣地斜線立ち上がり(m) <input type="text" value="20"/>
隣地斜線勾配 <input type="text" value="1.25"/>	隣地斜線勾配 <input type="text" value="規制なし"/>	隣地斜線勾配 <input type="text" value="1.25"/>
北側斜線立ち上がり(m) <input type="text" value="10"/>	北側斜線立ち上がり(m) <input type="text" value="5"/>	北側斜線立ち上がり(m) <input type="text" value="10"/>
北側斜線勾配 <input type="text" value="1.25"/>	北側斜線勾配 <input type="text" value="1.25"/>	北側斜線勾配 <input type="text" value="1.25"/>



Buildable space based on planning regulations

Image of the tool



地区の縮尺変更

全体表示 拡大 縮小

地区の表示切替

街区ポリゴン 街区番号 番号=1

敷地ポリゴン 敷地番号 番号=1

道路ライン 角地 角地=■

街区ポイント

その他切り替え

クリックした敷地の属性情報を表示します↓↓↓
 (※ただし、敷地ポリゴンの表示時のみ！)

敷地番号		1	敷地面積	150(m ²)	北側道路？	4m道路	隣地立上がり高さ	20(m)
(X3, Y3) (X2, Y2) (X0, Y0) (X1, Y1)	(X0, Y0)	(9,60)	絶対高さ	規制なし(m)	東側道路？	道路なし	隣地斜線勾配	1.25(m)
	(X1, Y1)	(19,60)	容積率	200(%)	南側道路？	道路なし	北側立上がり高さ	10(m)
	(X2, Y2)	(19,75)	建蔽率	60(%)	西側道路？	4m道路	北側斜線勾配	1.25
	(X3, Y3)	(9,75)	角地？	角地	道路斜線適用限界距離	20(m)		
用途地域	第一種中高層住居専用地域		壁面後退距離	規制なし(m)	道路斜線勾配	1.25	建築利用可能空間	表示

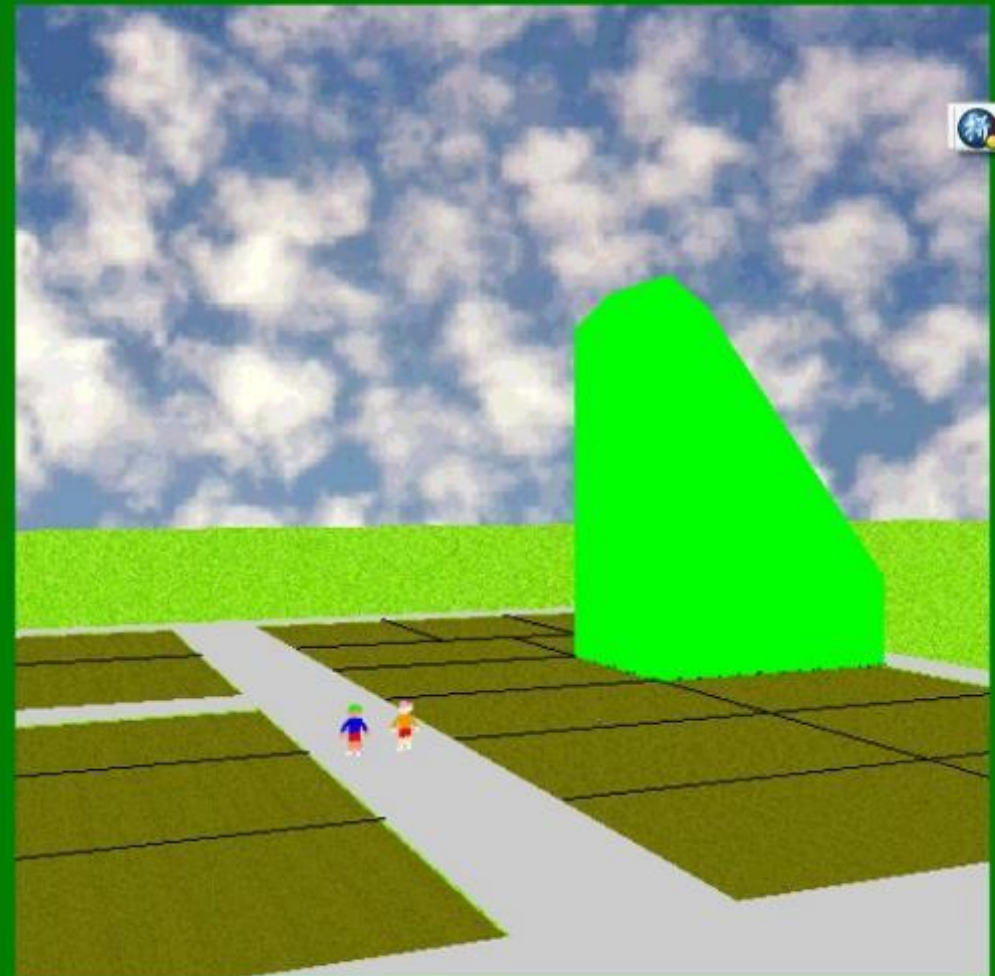


Buildable space based on planning regulations

Image of the tool

建築利用可能空間の3次元表示

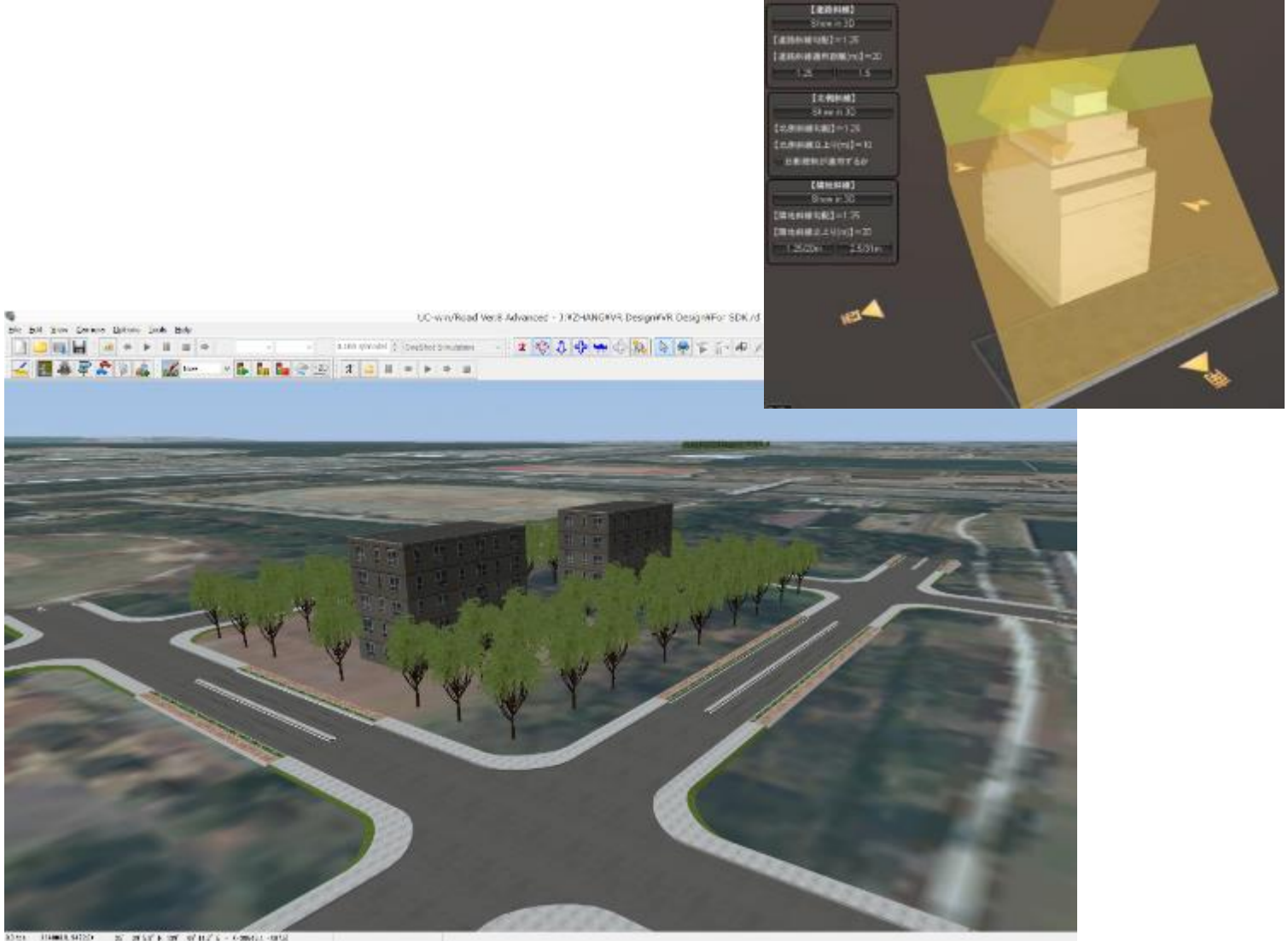
あなたが選択した敷地と設定条件	
敷地番号	28
敷地座標(X,Y)	間口X=10
(90,51) (105,51)	奥行Y=15
<input type="text"/>	敷地面積(m ²)=150
(90,41) (105,41)	絶対高さ(m)=規制なし
隣接道路	(北側道路)=(道路なし)
(北道)	(西側道路)=(道路なし)
(西道) <input type="text"/> (東道)	(東側道路)=(4m道路)
(南道)	(南側道路)=(道路なし)
道路斜線	勾配:1.25
	適用距離(m):20
隣地斜線	勾配:1.25
	立上り高さ(m):20
用途地域	第一種住居地域
視点の移動(空間を) <input type="radio"/> 南→北 <input type="radio"/> 北→南	
<input type="radio"/> 西→東 <input type="radio"/> 東→西	
<input checked="" type="radio"/> 最初の視点位置へ	
<input type="radio"/> ワイヤー表示	<input type="button" value="表示を更新"/>
<input checked="" type="radio"/> ポリゴン表示	



Buildable space based on planning regulations



Image of the tool



Advances in Geographic Information Science

Zhenjiang Shen

Geospatial Techniques in Urban Planning

 Springer

Strategies for Sustainability

Mitsuhiko Kawakami · Zhen-jiang Shen
Jen-te Pai · Xiao-lu Gao
Ming Zhang *Editors*

Spatial Planning and Sustainable Development

Approaches for Achieving Sustainable
Urban Form in Asian Cities

 Springer

Thank you for your attention