

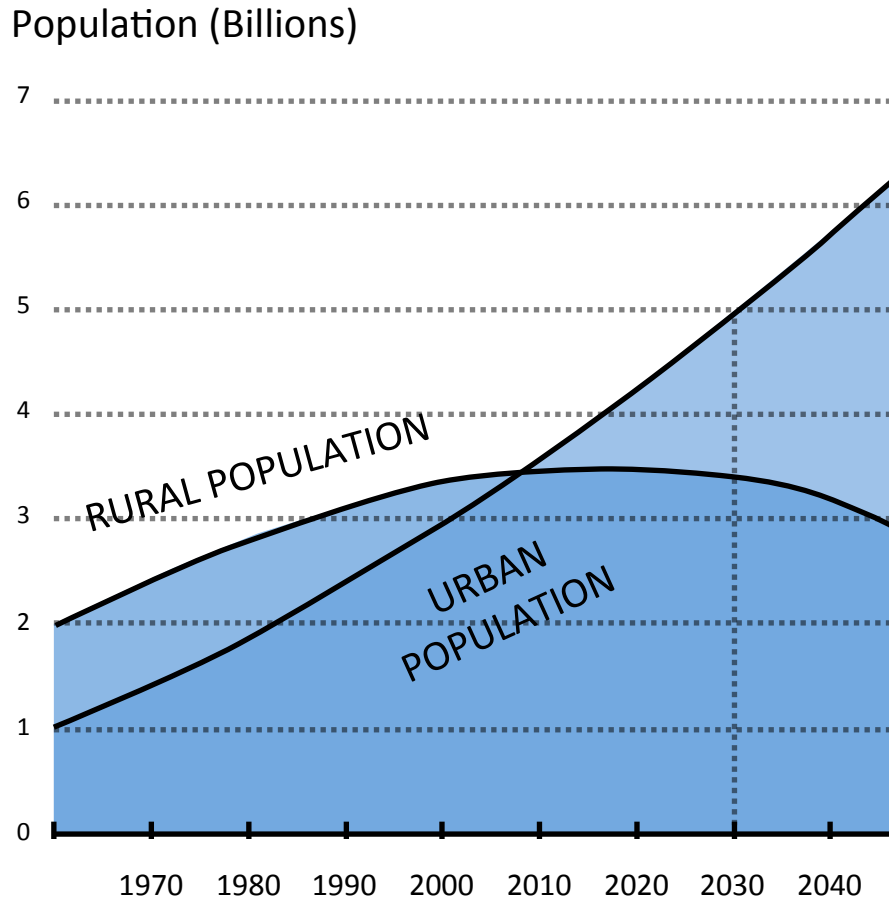


The Big Integration

Simulation Platforms for Low Carbon Decision Making

Dr. Matthias Berger

- Role of Information & BigData
- Interactive Tools for Decision Making
- Urban Planning @ FCL
- Beyond Smart Cities



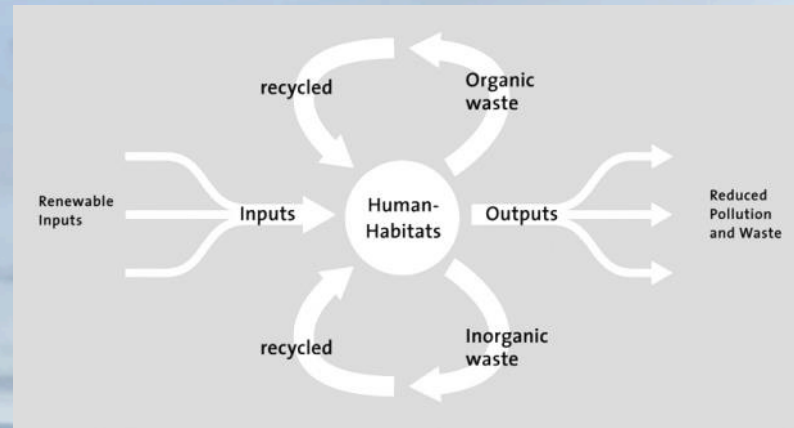
Expected urban and rural population growth

Source: GeoHive

Urbanization is continuing, but coming to an end.

We need to better understand how large cities are functioning in order to be able to design and plan more sustainable urban environments.





Source: Richard Rogers,
Cities for a Small Planet, 1996

- Role of Information & BigData
- Interactive Tools for Decision Making
- Urban Planning @ FCL
- Beyond Smart Cities

SMALL

BUILDING TECHNOLOGY

LOW EXERGY

DIGITAL FABRICATION

A/P ARCHITECTURE & CONSTRUCTION

MEDIUM

URBAN DESIGN

TRANSFORMING & MINING URBAN STOCKS

HOUSING

URBAN DESIGN STRATEGIES & RESOURCES

URBAN SOCIOLOGY

A/P ARCHITECTURE & URBAN PLANNING

LARGE

TERRITORIAL PLANNING

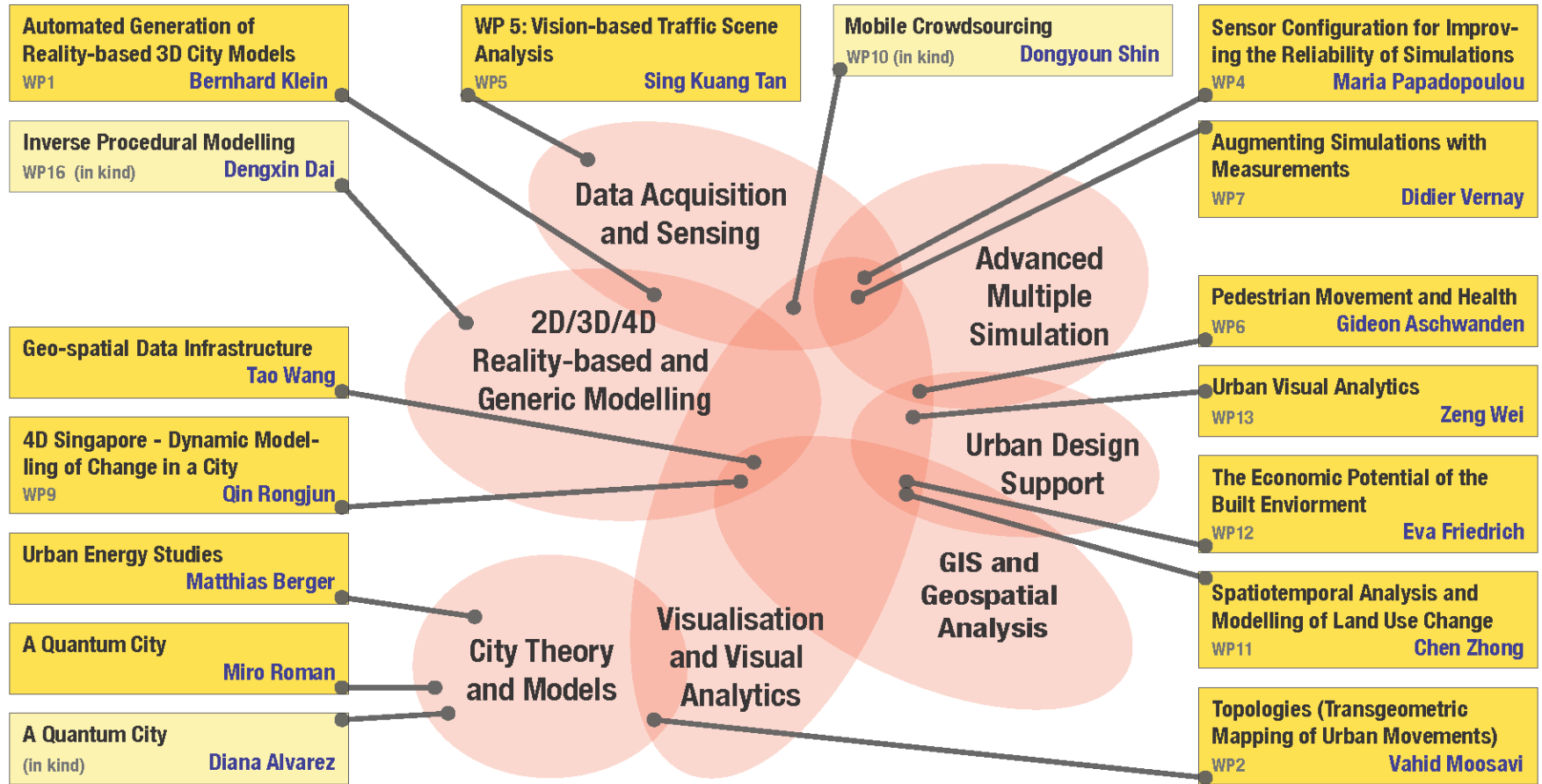
TERRITORIAL ORGANISATION

LANDSCAPE ECOLOGY

MOBILITY & TRANSPORTATION PLANNING

A/P ARCHITECTURE & TERRITORIAL PLANNING

SIMULATION PLATFORM



Module Leader: Prof. Dr. Gerhard Schmitt

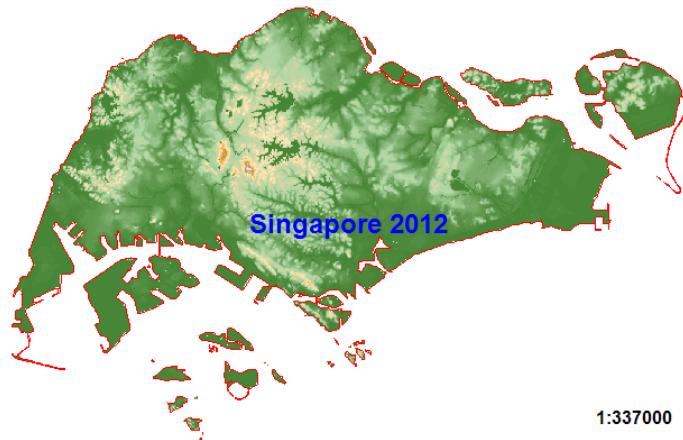
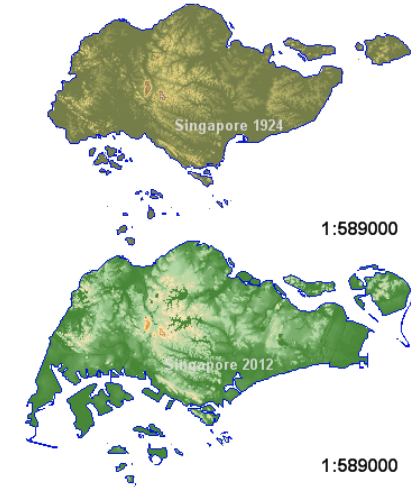
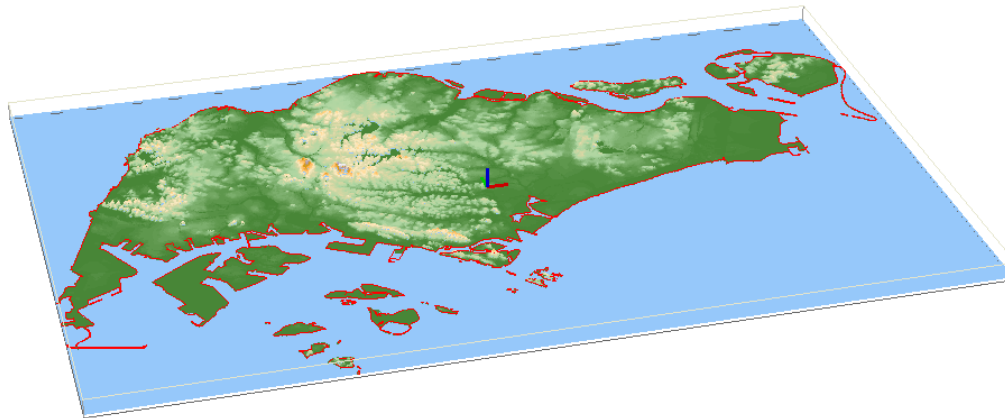
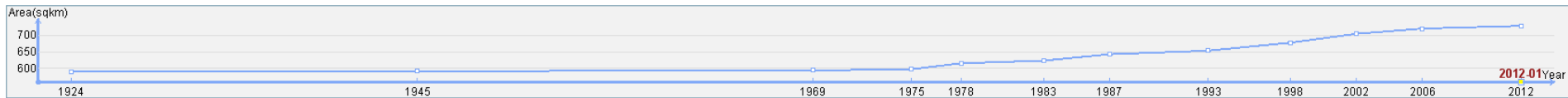
Principal Investigators: Prof. em. Dr. Armin Grün - Prof. Dr. Ludger Hovestadt - Prof. Dr. Ian Smith - Prof. Dr. Stefan Müller Arisona

Affiliated Faculty: Prof. Dr. Luc van Gool (ETH Zurich) - Prof. Dr. Tat Jen Cham (NTU) - Prof. Dr. Chi-Wing Fu (NTU) - Prof. Dr. Benny Raphael (NUS)

Postdoctoral Fellows: Dr. Matthias Berger - Dr. Tao Wang - Dr. Bernhard Klein

System Specialists: Daniel Sin - Rewell Dangoy

Dynamics and Transformation of Singapore's Topography from 1924 to 2012



Simulation of the transformation of topographic surface from 1924 to 2012 based on digital elevation models of two years and coast lines of 12 separate years reconstructed from topographic maps. The simulation is based on a modified geo-morphing algorithm.

The digital elevation data has been used in the synergy project "Transforming Topographies", together with Module III Professor Uta Hassler and assistant Professor Milica Topalovic. The National Archives of Singapore and the Mapping Unit of the Ministry of Defence are gratefully acknowledged as data sources.

Urban Monitoring with Unmanned Aerial Vehicles (UAVs)

3D campus map of the National University of Singapore.

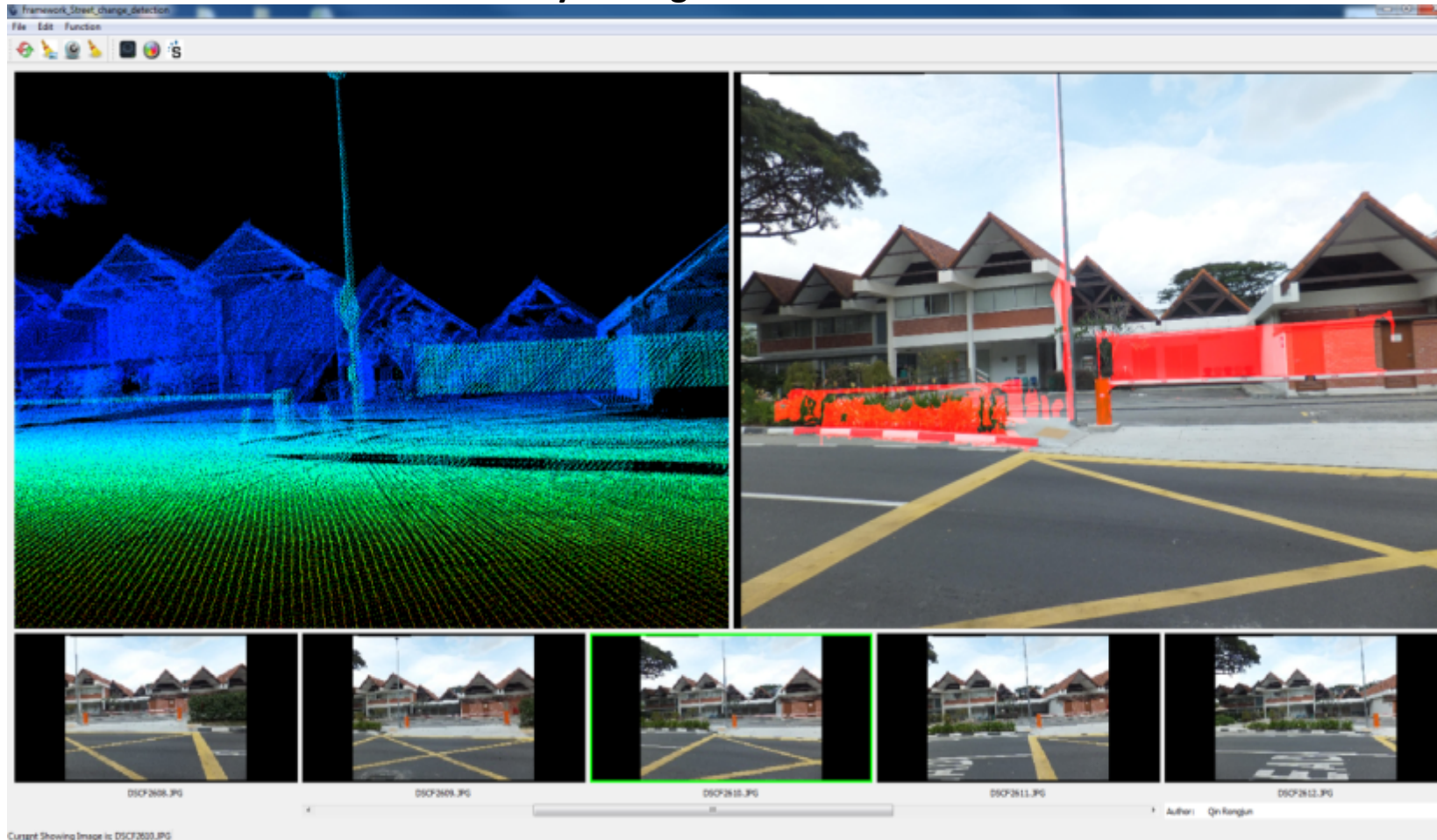


Urban Monitoring with Unmanned Aerial Vehicles (UAVs)

UAVs are a flexible platform to acquire high resolution information for small scale urban applications. We develop techniques to monitor small-scale changes in urban environments or to identify Dengue hotspots.



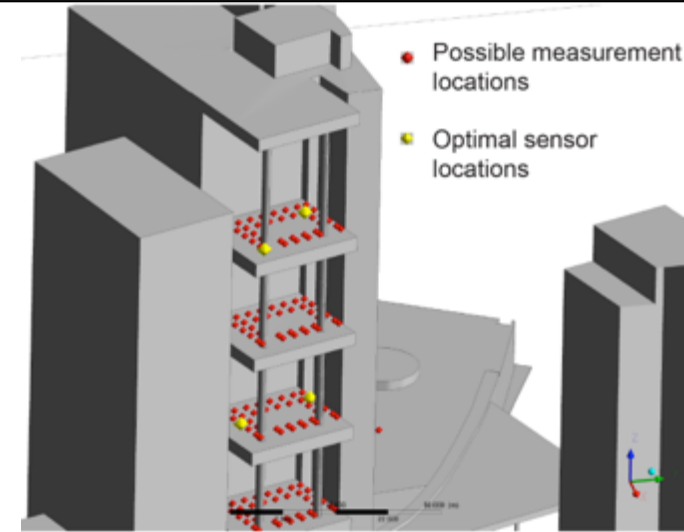
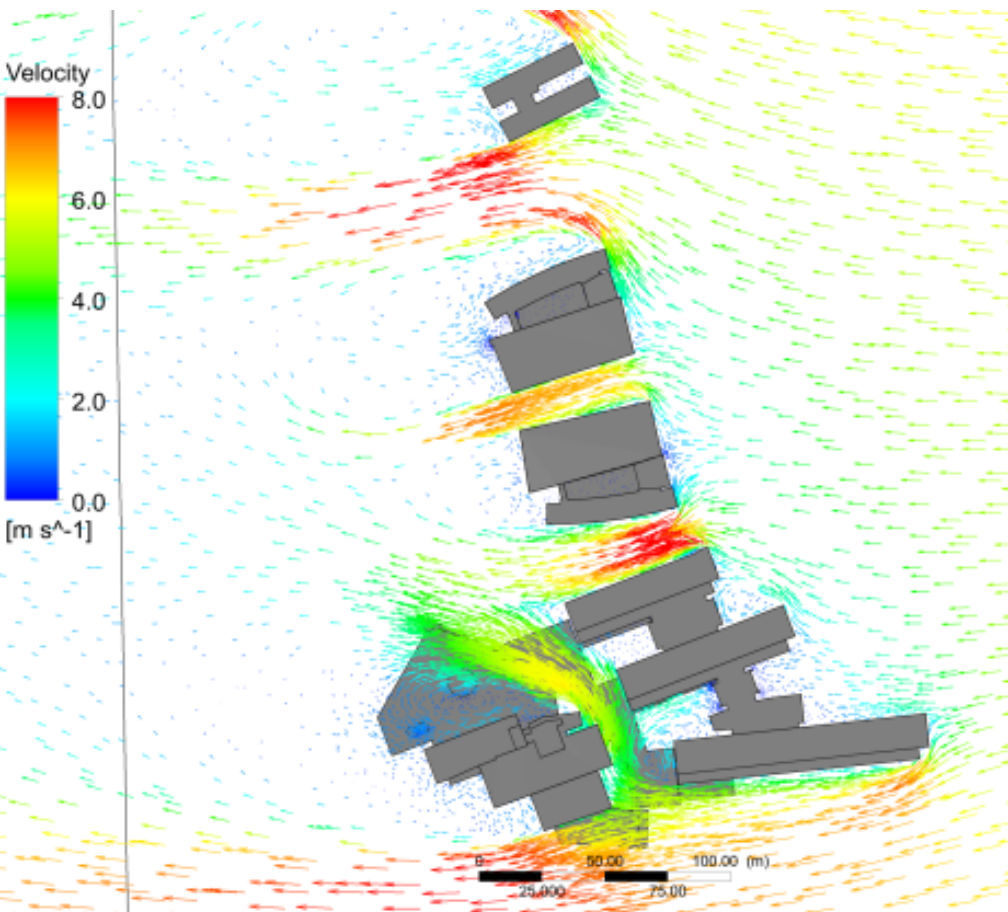
Change Detection at Street Level for Urban Facility Management



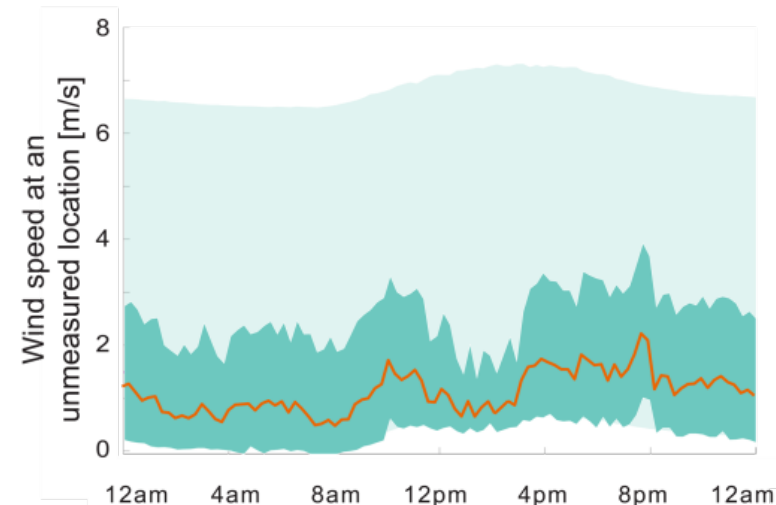
Using geospatial technologies, changes happen at the street side can be efficiently detected. It has the potential to release the labor effort to visit on site for checking facility damages, illegal dumping. Mobile Mapping Systems (Vehicles equipped with laser scanner and mass image acquisition system) could help to rapidly acquire 3D information. We develop algorithms to detect the differences of the 3D data captured from different period, which could serve as a tool to locate the changes with minimal effort.

Prediction of Airflow around High-rise Buildings

Measurement data are employed to improve Computational-Fluid Dynamics predictions optimal sensor locations are locations with the highest information content (entropy-measure).



- Prediction ranges **before** measurements
- Prediction ranges **after** measurements
- Mean values **after** measurements





Key Message:

Information is needed as basic input in models and simulations based on bottom-up engineering.

Contrary, BigData is strong in black-box models.

- Role of Information & BigData
- Interactive Tools for Decision Making
- Urban Planning @ FCL
- Beyond Smart Cities

The Big Integration

(SEC) SINGAPORE-ETH
CENTRE

新加坡-ETH
研究中心

(FCL) FUTURE
CITIES
LABORATORY

未来
城市
实验室



Drawing: Lukas Treyer, ETH Zürich, 2005



CHWS

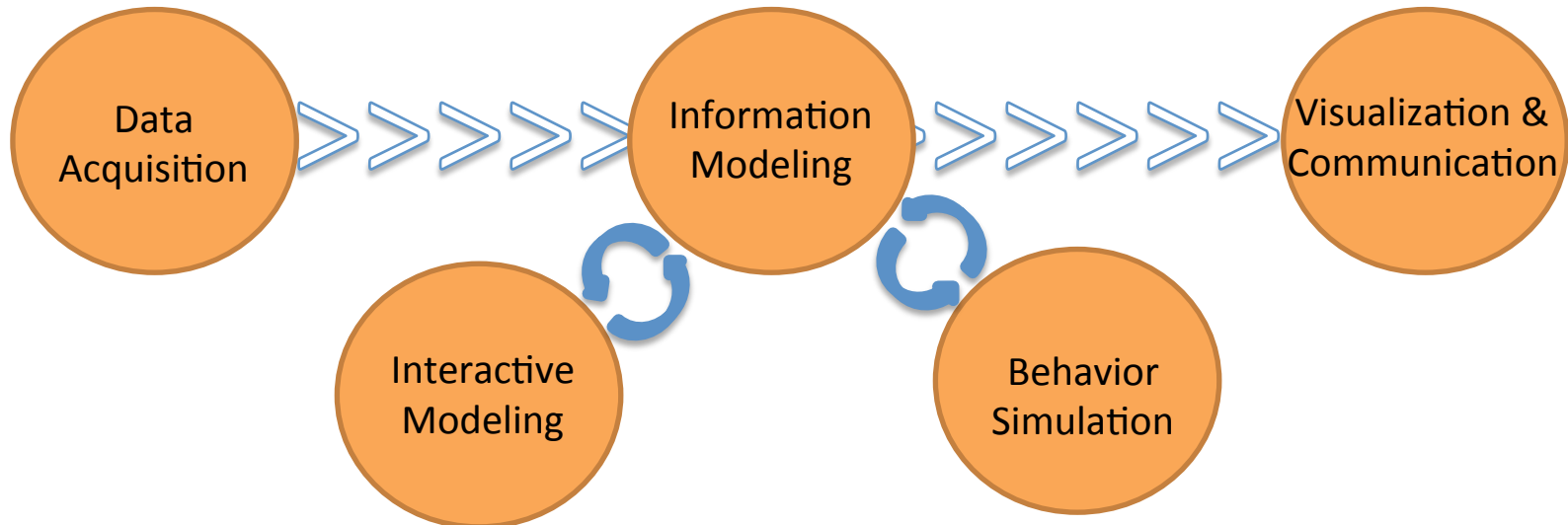
CHWP



The Big Integration

(SEC) SINGAPORE-ETH CENTRE 新加坡-ETH 研究中心

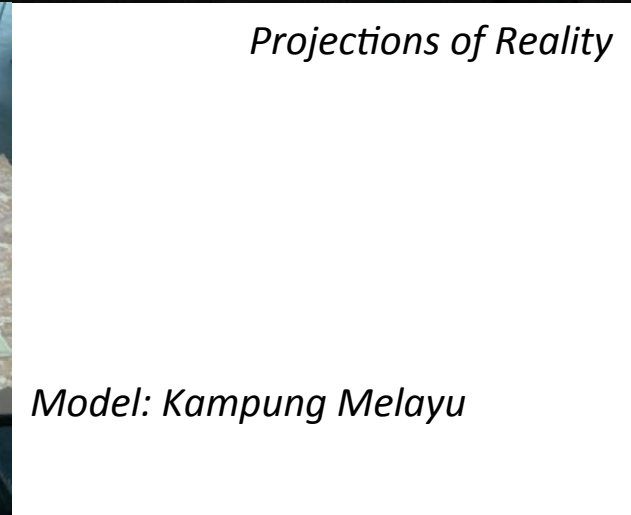
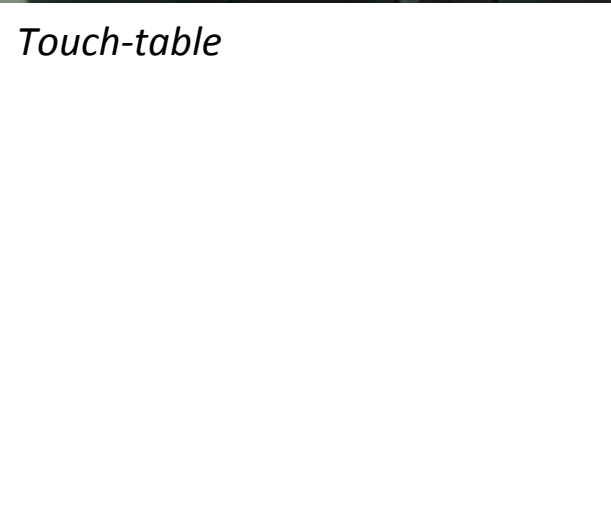
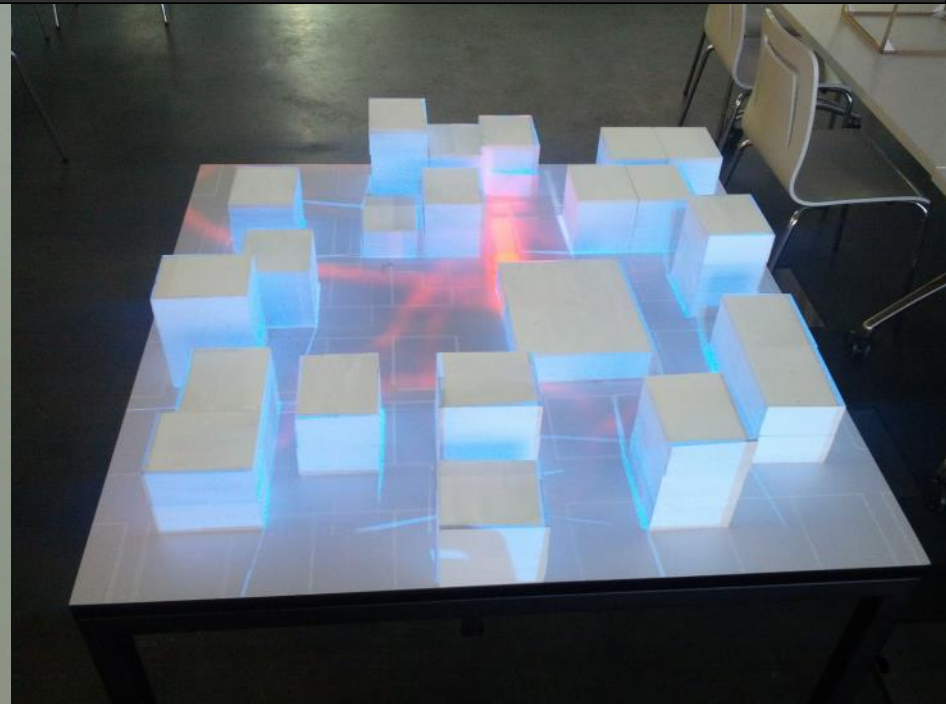
(FCL) FUTURE CITIES LABORATORY 未来城市实验室



The Big Integration

(SEC) SINGAPORE-ETH
CENTRE 新加坡-ETH
研究中心

(FCL) FUTURE
CITIES
LABORATORY 未来
城市
实验室



Touch-table

Projections of Reality

Model: Kampung Melayu



The Big Integration

(SEC) SINGAPORE-ETH
CENTRE 新加坡-ETH
研究中心

(FCL) FUTURE
CITIES
LABORATORY 未来
城市
实验室



A hand is shown interacting with a large, interactive digital display. The display shows a complex network visualization with numerous nodes and connecting lines. The nodes are primarily red and green, and the lines are white and green. The background is dark, and the overall scene suggests a high-tech or data-driven environment.

Key Message:

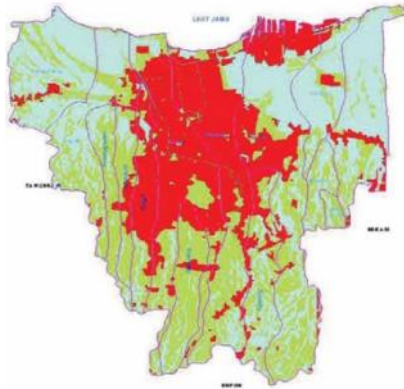
Transforming data and information into knowledge can be enhanced by interactive visualizations and workspaces.

- Role of Information & BigData
- Interactive Tools for Decision Making
- **Urban Planning @ FCL**
- Beyond Smart Cities

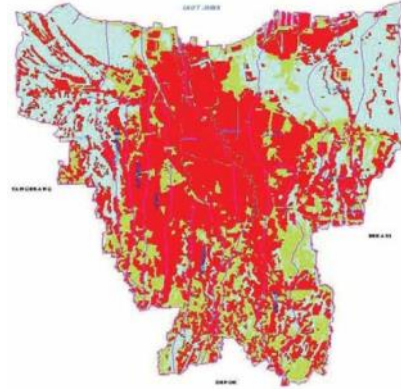
Jakarta in 1930



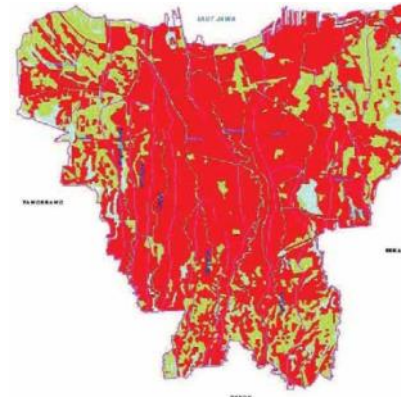
Population Growth



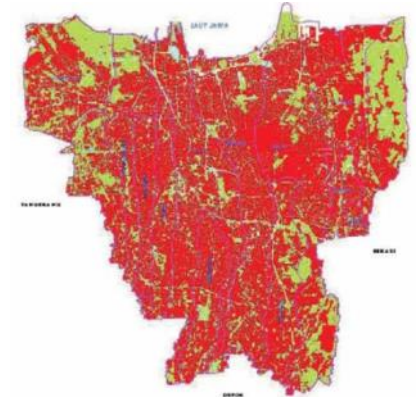
1970



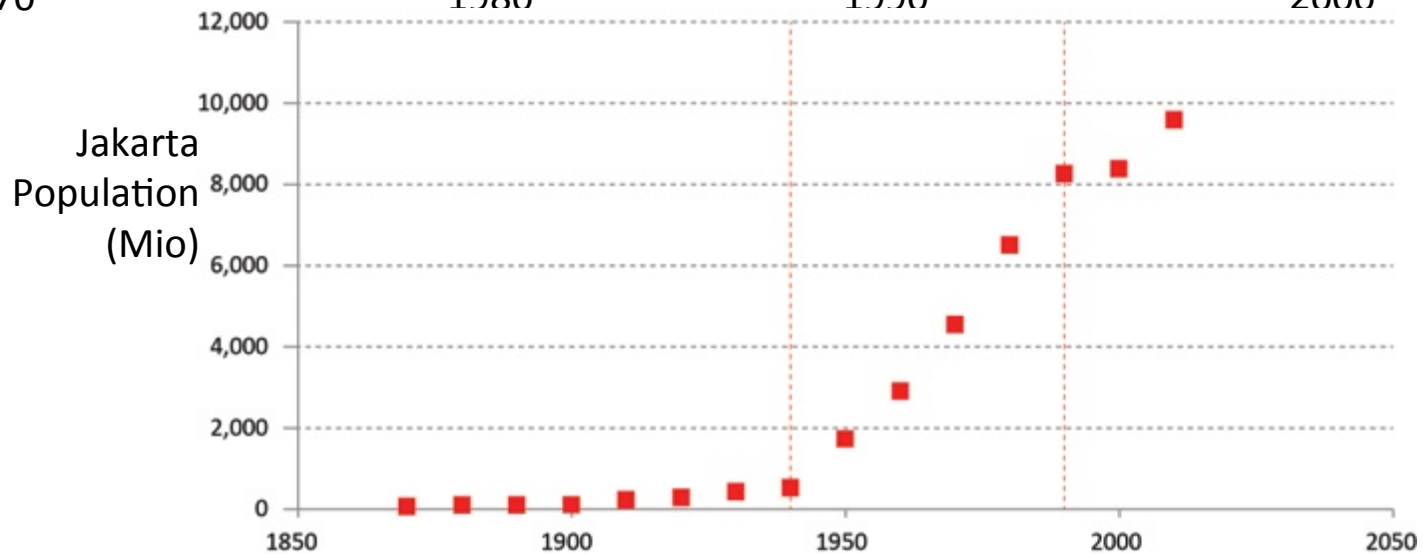
1980



1990



2000



Urban Analysis: Stocks and Flows of Finance



TEMPAT TINGGAL	Blok no.	<input type="text"/>	Lantai	<input type="text"/>	
TEMPAT TINGGAL	Milik	<input type="text"/>	Sewa	<input type="text"/>	Lainnya <input type="text"/>

DATA RUMAH TANGGA

Suami	<input type="text"/>	Istri	<input type="text"/>	Jelaskan	<input type="text"/>
Anak (berapa)	<input type="text"/>	Keluarga Lainnya (Paman, sepupu dll)	<input type="text"/>	Jelaskan	<input type="text"/>
Lainya (Kos dll) (berapa)	<input type="text"/>		<input type="text"/>	Jelaskan	<input type="text"/>
JUMLAH ORANG	<input type="text"/>				

EKONOMI DOMESTIK

ANGGOTA KELUARGA 1	Usia	Pendidikan Terakhir						Jenis Kelamin		Suku Bangsa							
Deskripsi Pekerjaan	IRT, Buruh Pabrik, Supir Ojek, Mahasiswa, Pekerja Toko, UKM, Professional, dll						Jauh Tempat Kerja Km		-0.5	0.5	1	2	3	5	10	+20	
Gaji (Rupiah/Bulan)	<300rb	300-500rb	500rb-1jt	1-1,5jt	1,5-2jt	2jt-3jt	3jt-5jt	5jt-10jt	10jt+	Lokasi Tempat Kerja							
Jumlah Hari Kerja (Bulan)	<3	5	10	15	20	25	30	Lama Berkerja Bulan/tahun		<3 bul	3 bul	6 bul	12 bul	1 tah	2 tah	5 tah	+10 tah
Lama Tinggal disini?	3 bulan	6 bulan	1 tahun	2 tahun	3 tahun	4 tahun	5 tahun	6 tahun	10+	Lahir							
Asal Kelurahan/Kota																	
Frekwensi Pulang Kampung?	3 bulan	6 bulan	1 tahun	2 tahun	3 tahun	4 tahun	5 tahun	6 tahun	10+	Tak pernah							

ANGGOTA KELUARGA 2	Usia	Pendidikan Terakhir						Jenis Kelamin		Suku Bangsa							
Deskripsi Pekerjaan	IRT, Buruh Pabrik, Supir Ojek, Mahasiswa, Pekerja Toko, UKM, Professional, dll						Jauh Tempat Kerja Km		-0.5	0.5	1	2	3	5	10	+20	
Gaji (Rupiah/Bulan)	<300rb	300-500rb	500rb-1jt	1-1,5jt	1,5-2jt	2jt-3jt	3jt-5jt	5jt-10jt	10jt+	Lokasi Tempat Kerja							
Jumlah Hari Kerja (Bulan)	<3	5	10	15	20	25	30	Lama Berkerja Bulan/tahun		<3 bul	3 bul	6 bul	12 bul	1 tah	2 tah	5 tah	+10 tah
Lama Tinggal di Pluit/Marda?	3 bulan	6 bulan	1 tahun	2 tahun	3 tahun	4 tahun	5 tahun	6 tahun	10+	Lahir							
Asal Kelurahan/Kota																	
Frekwensi Pulang Kampung?	3 bulan	6 bulan	1 tahun	2 tahun	3 tahun	4 tahun	5 tahun	6 tahun	10+	Tak pernah							

ANGGOTA KELUARGA 3	Usia	Pendidikan Terakhir						Jenis Kelamin		Suku Bangsa							
Deskripsi Pekerjaan	IRT, Buruh Pabrik, Supir Ojek, Mahasiswa, Pekerja Toko, UKM, Professional, dll						Jauh Tempat Kerja Km		-0.5	0.5	1	2	3	5	10	+20	
Gaji (Rupiah/Bulan)	<300rb	300-500rb	500rb-1jt	1-1,5jt	1,5-2jt	2jt-3jt	3jt-5jt	5jt-10jt	10jt+	Lokasi Tempat Kerja							
Jumlah Hari Kerja (Bulan)	<3	5	10	15	20	25	30	Lama Berkerja Bulan/tahun		<3 bul	3 bul	6 bu	12 bul	1 tah	2 tah	5 tah	+10 tah
Lama Tinggal di Marunda?	3 bulan	6 bulan	1 tahun	2 tahun	3 tahun	4 tahun	5 tahun	6 tahun	10+	Lahir							
Asal Kelurahan/Kota																	

Business Survey in three Kampung in Jakarta



Sawah Besar



Kampung Bali



Menteng

Business Activities in Different Urban Settings



0.17 shops per inhabitant

- daily needs
- restaurant
- food + drink
- multi-purpose
- services
- mobile phone + internet
- clothes, shoes, tailoring
- beauty, fitness
- decoration, stationery
- medical
- building materials and supplies
- mechanical, workshop, machinery



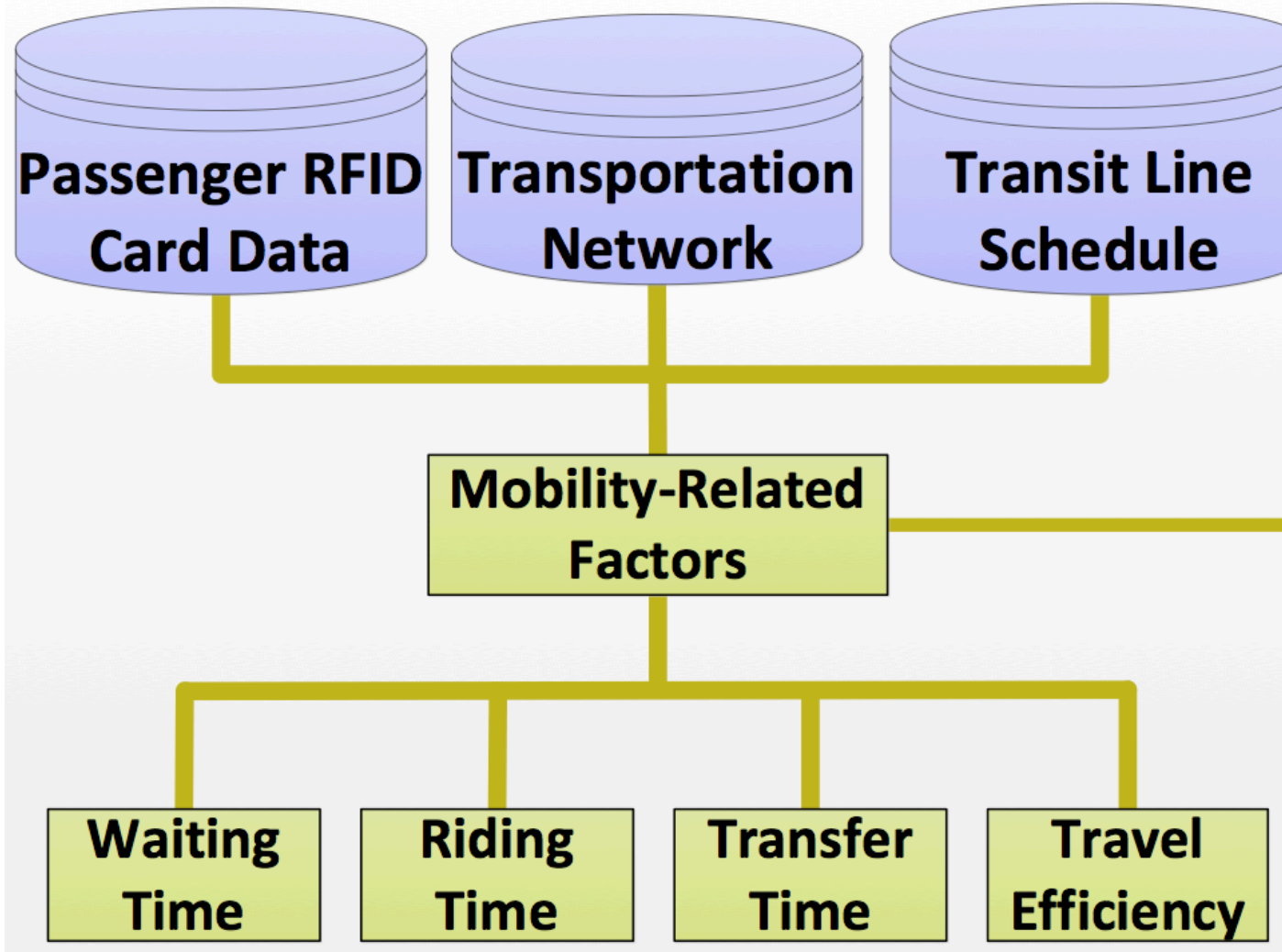
0.04 shops per inhabitant

Visual Analytics: How People Move...





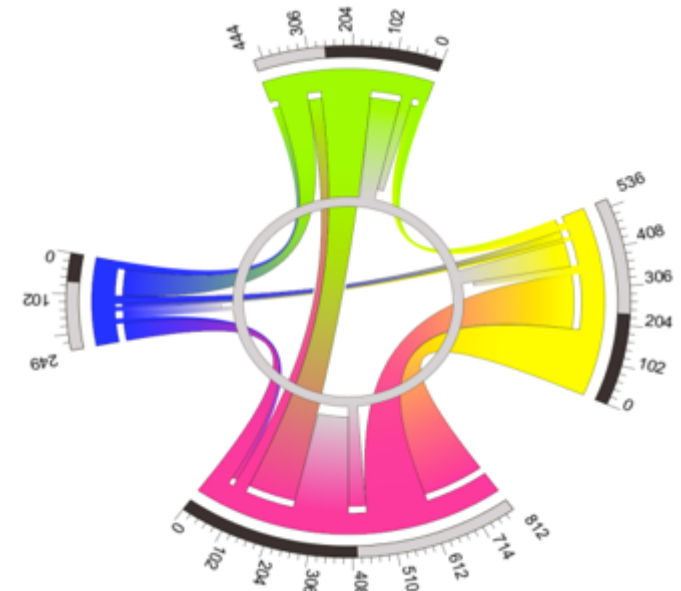
Photograph: Calvin Teo, 2005



Visual Analytics: Interchange Patterns

To link

	0	1	2	3	4
From link 0	0	86	25	50	81
1	32	0	84	140	20
2	12	22	0	14	25
3	156	40	57	0	174
4	25	20	10	181	0





Video: Zeng Wei, Future Cities Laboratory, 2014



Key Message:

Urban planning requires a long-term vision and suitable tools for extrapolation of future trends.



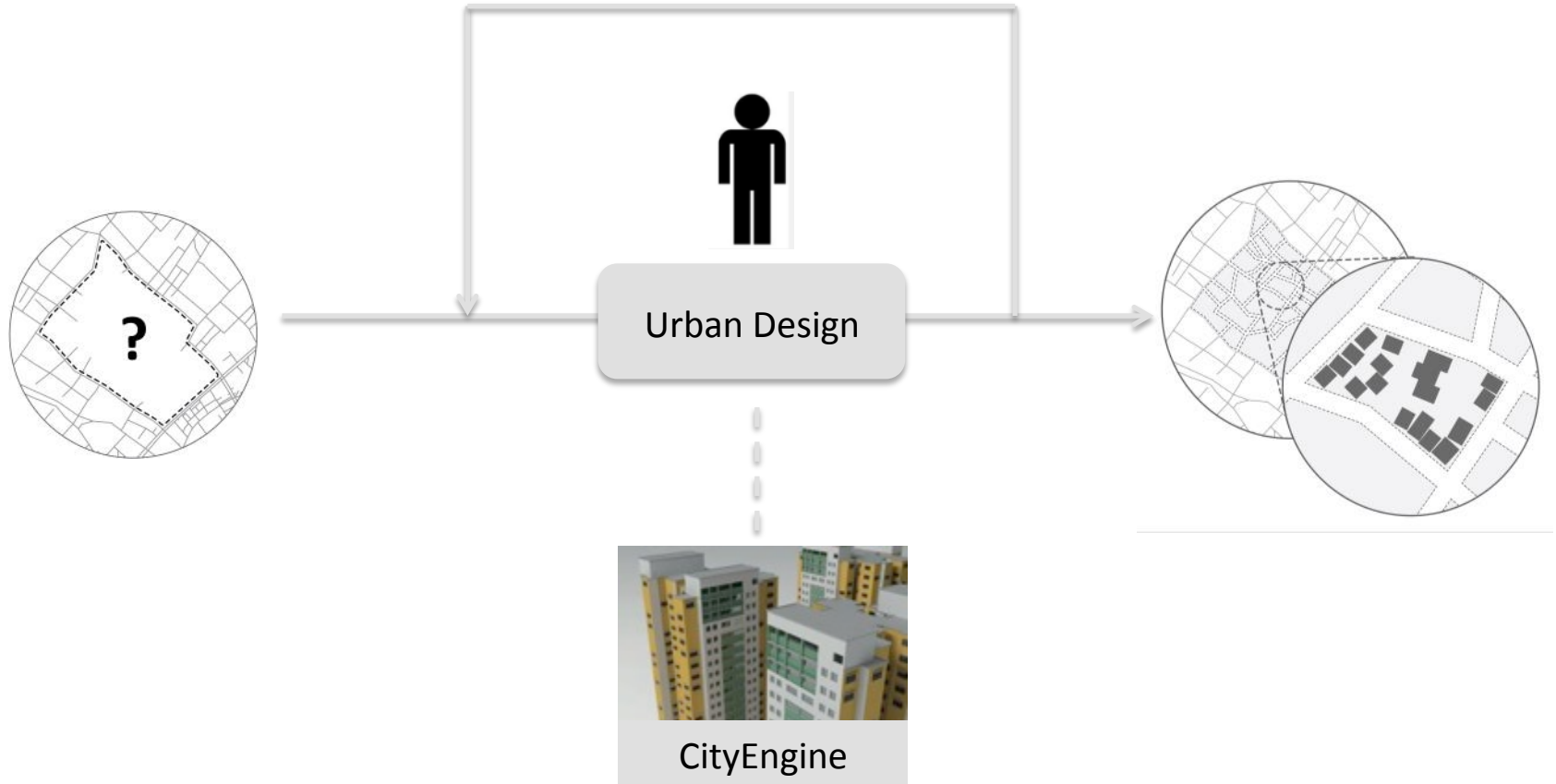
- Role of Information & BigData
- Interactive Tools for Decision Making
- Urban Planning @ FCL
- **Beyond Smart Cities**

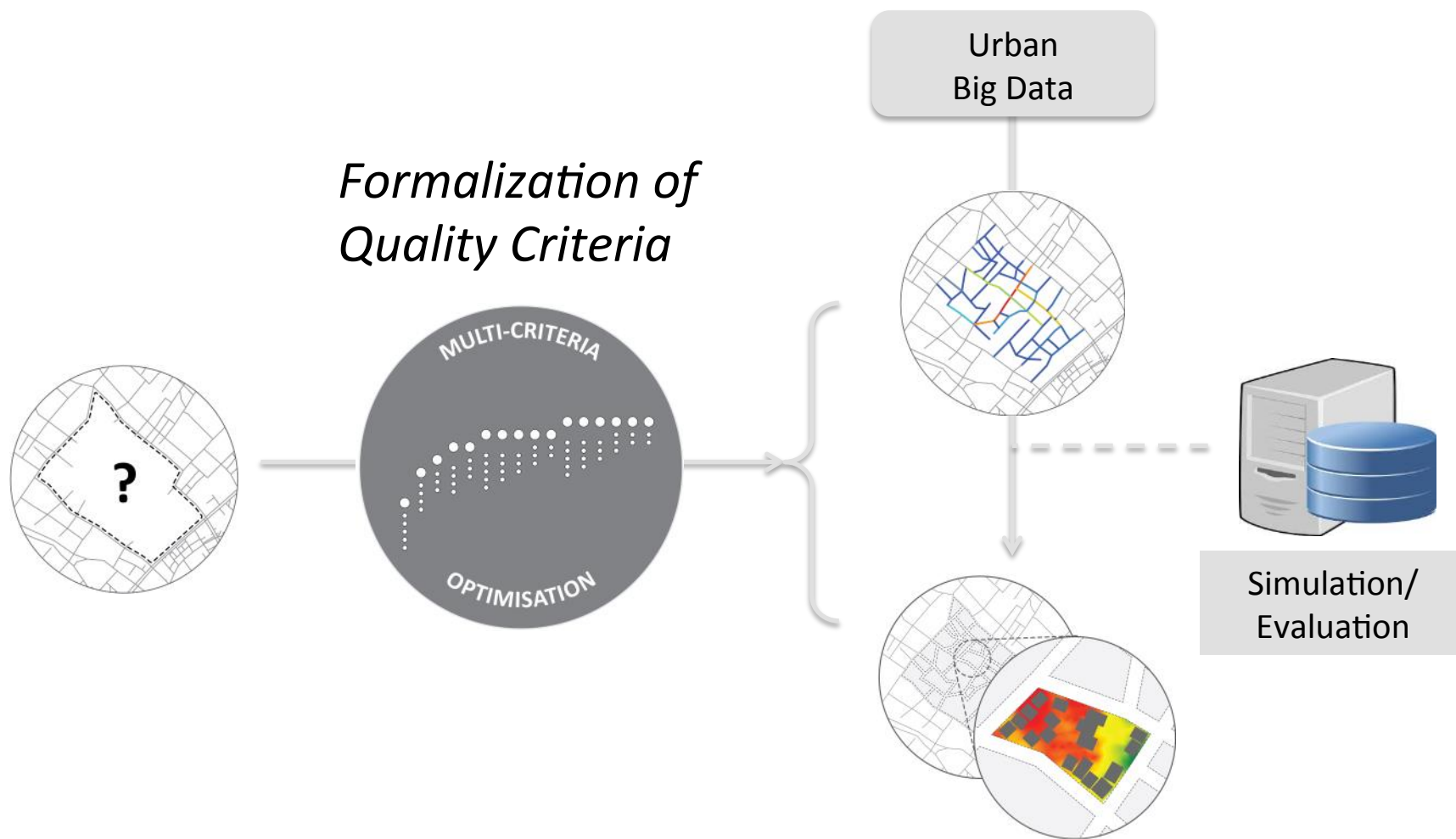
Design Space Exploration for Urban Compaction

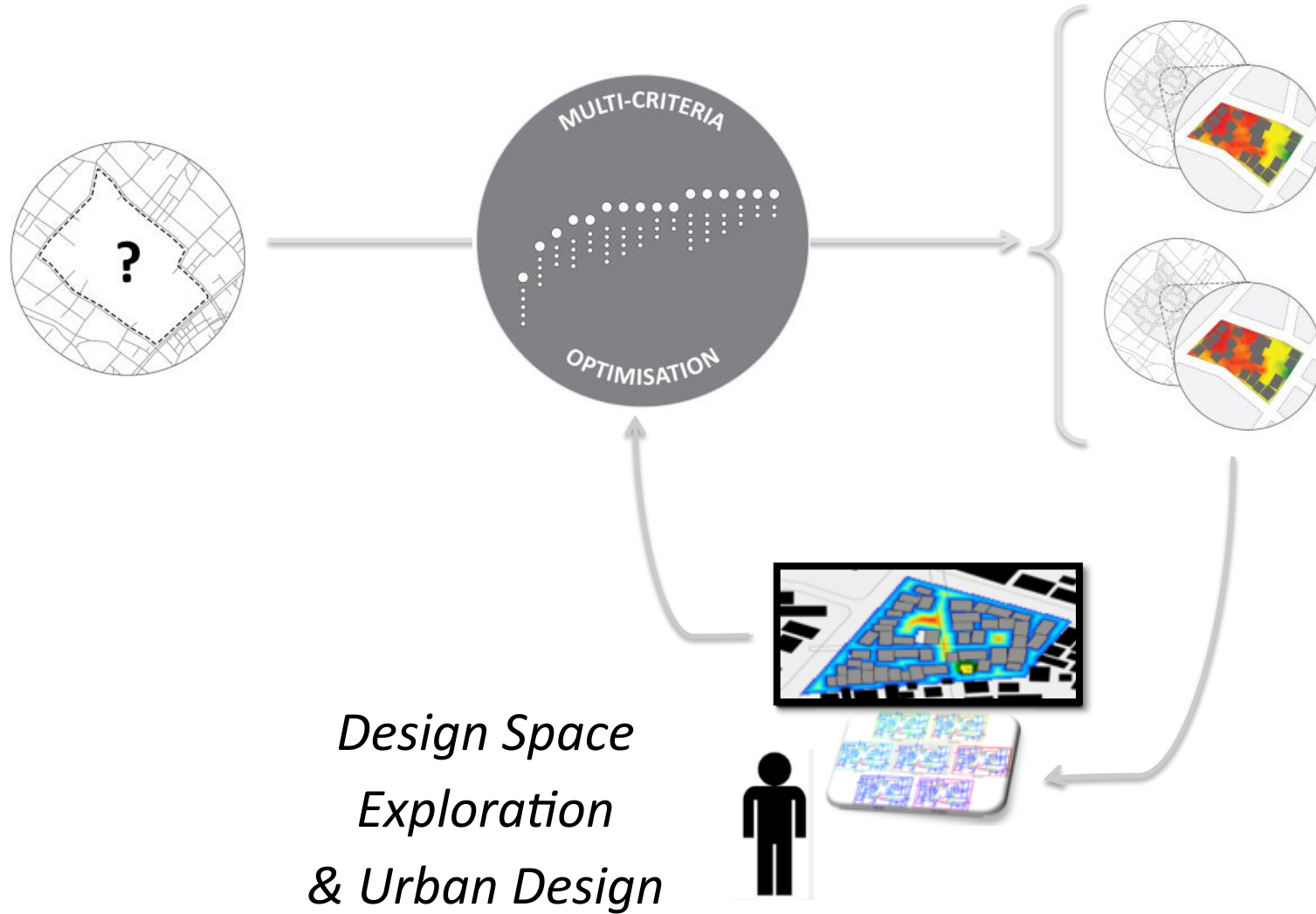
This project investigates new computational design methods based on urban big data to synthesise urban designs according to specified requirements.

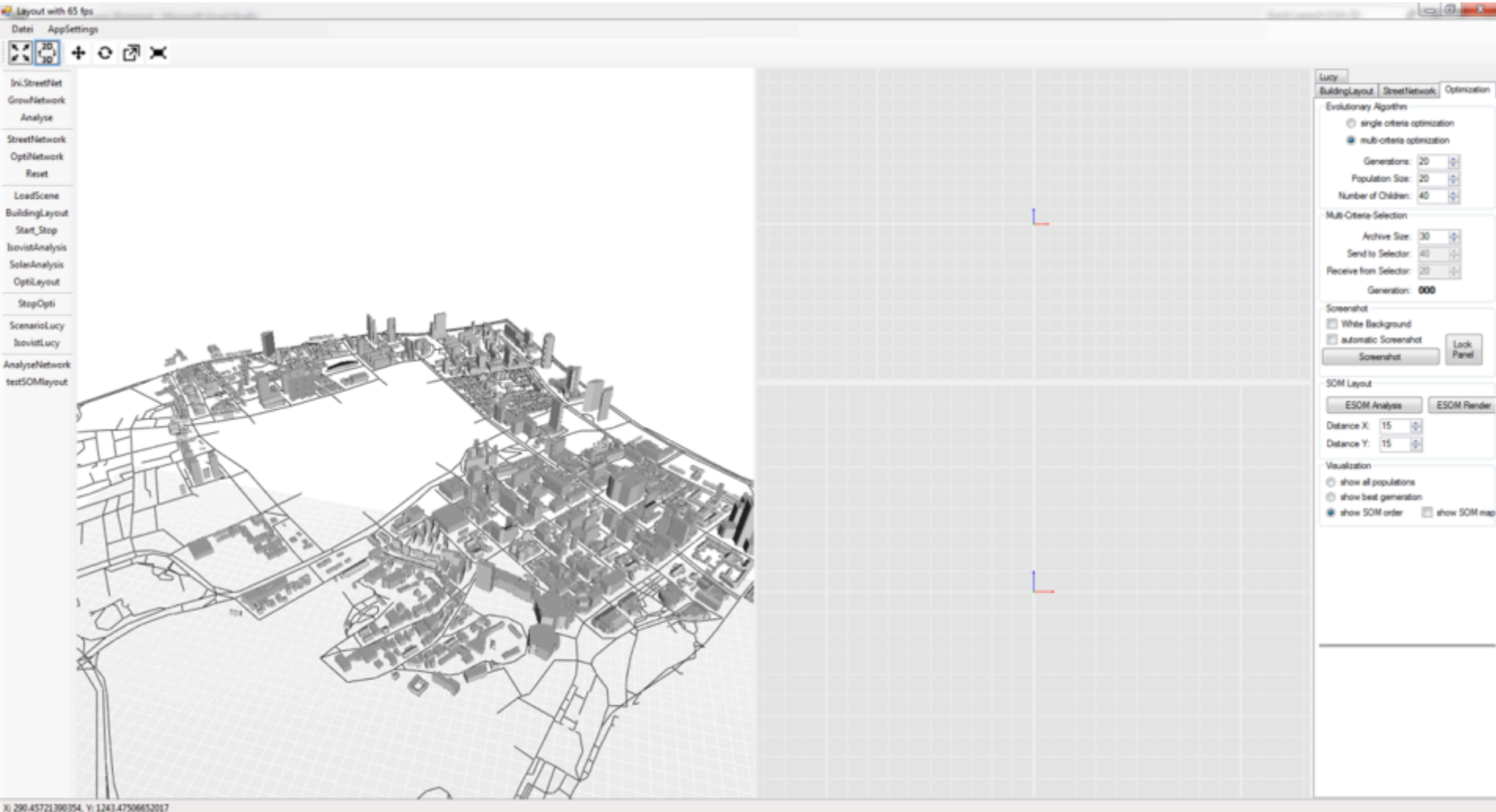


sg2014 Hong Kong

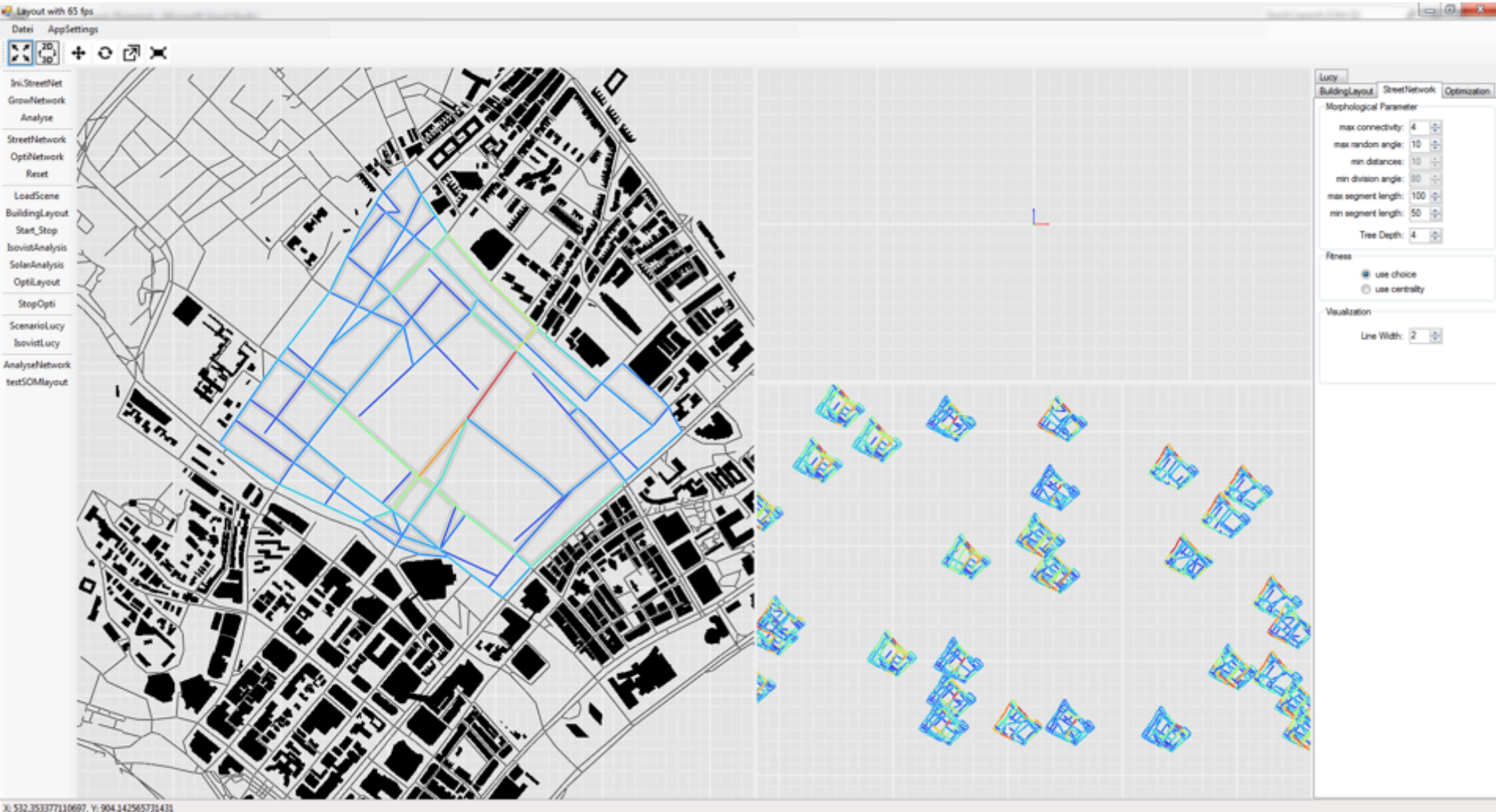




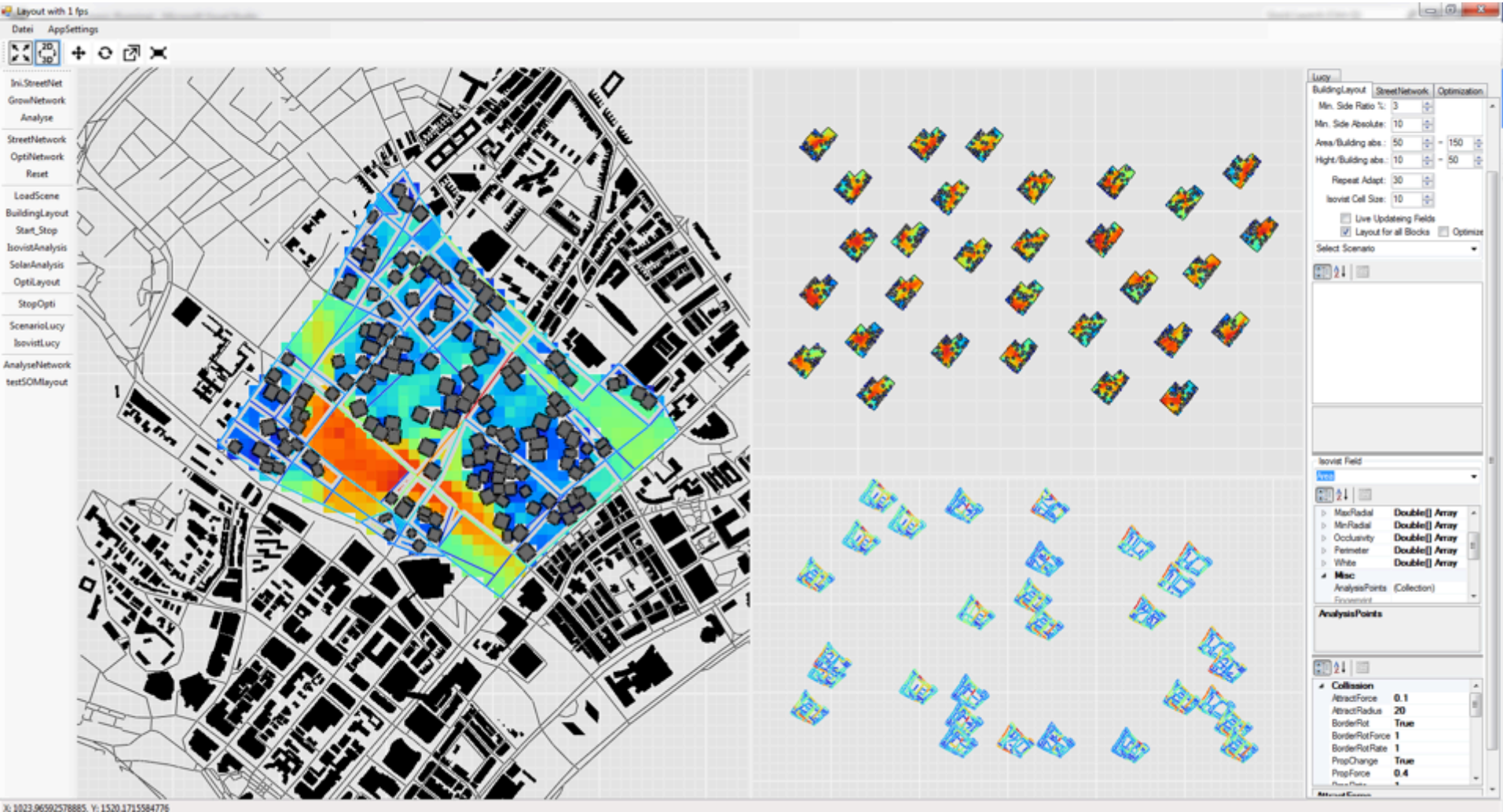




Photograph: Reinhard König, ETH Zürich, 2014

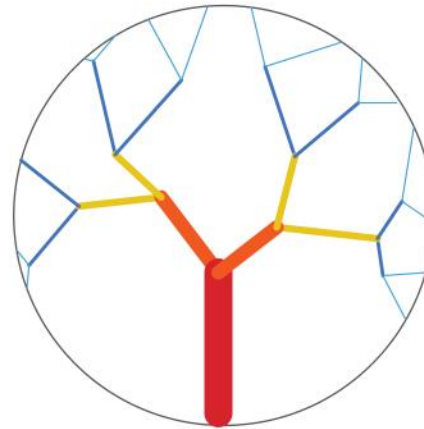
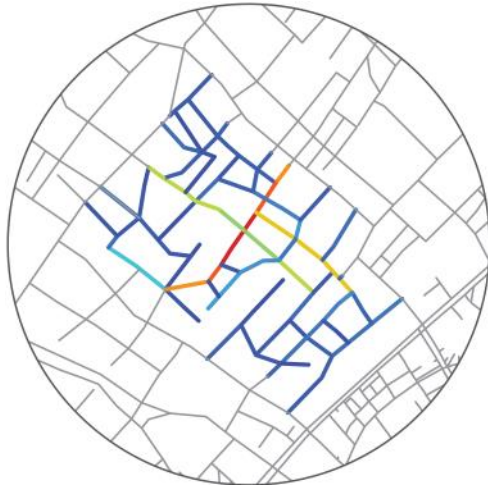


Photograph: Reinhard König, ETH Zürich, 2014



Photograph: Reinhard König, ETH Zürich, 2014

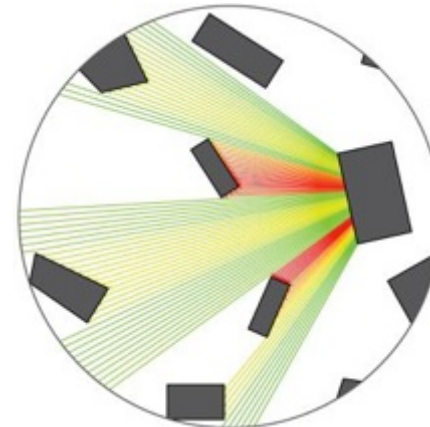
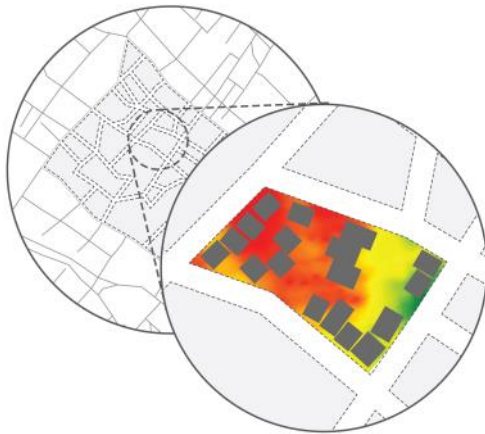
Beyond Smart Cities



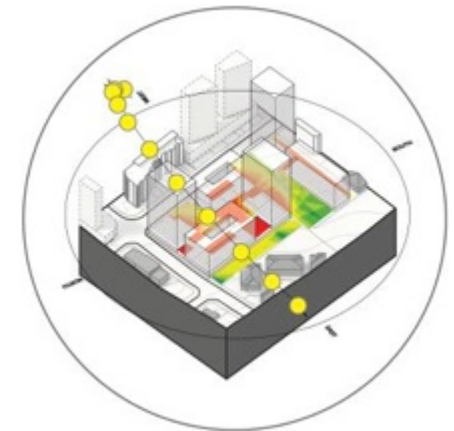
Traffic potential



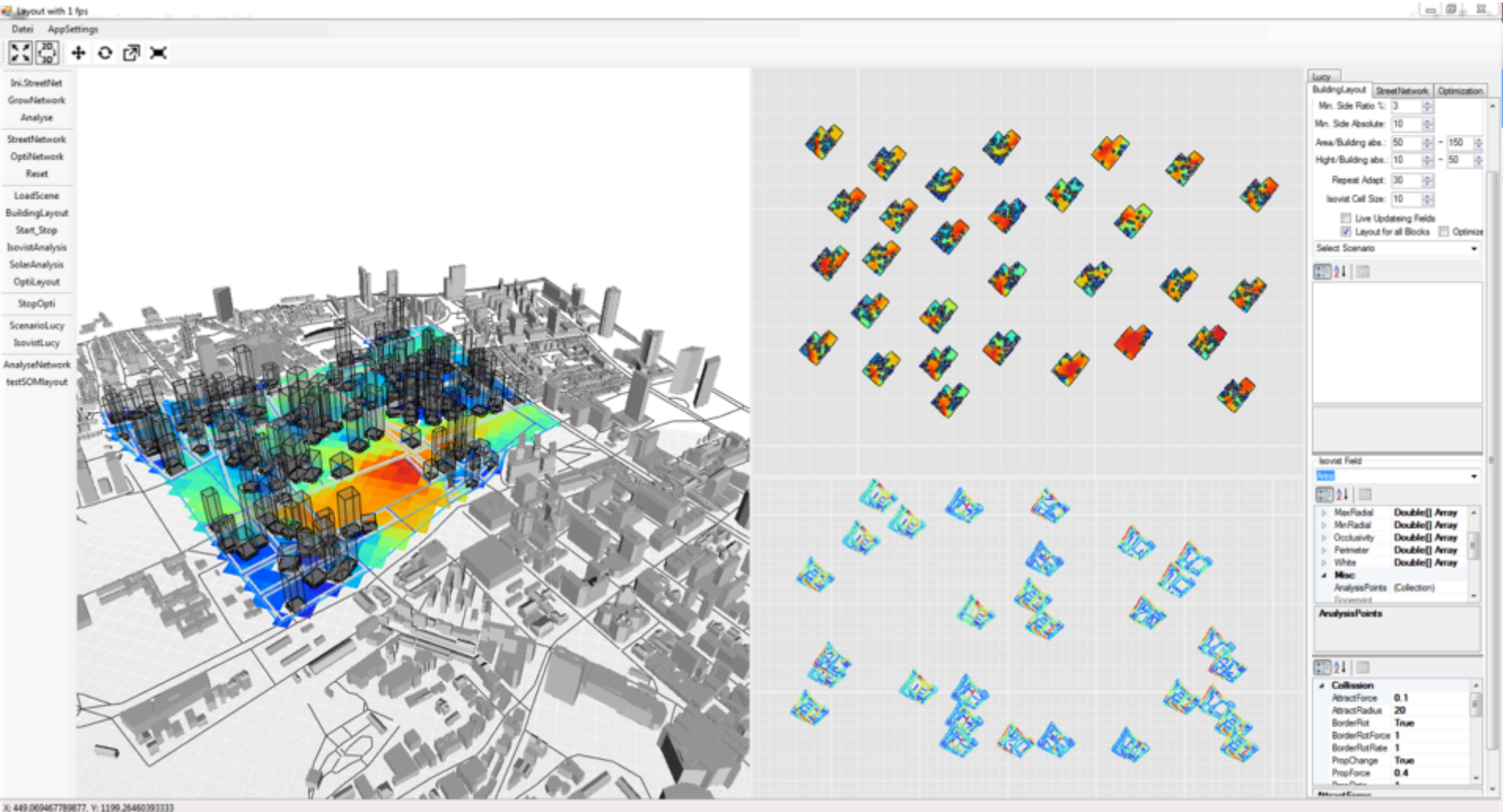
Parking availability



Privacy



Solar energy



Photograph: Reinhard König, ETH Zürich, 2014

Inclusive, cooler cities: A different take on liveability

WHAT MAKES A CITY ATTRACTIVE?

It is a common fallacy that the most liveable cities are those with the lowest crime rates, the best schools and the most green space. But a new study from the University of Melbourne suggests that the most liveable cities are those that are inclusive and offer a high quality of life for all their residents. The study, which is the first of its kind, found that cities that are inclusive and offer a high quality of life for all their residents are more likely to be liveable than those that are not. The study also found that cities that are inclusive and offer a high quality of life for all their residents are more likely to be cooler than those that are not.

GOOD GOVERNANCE

An important factor in determining a city's liveability is the quality of its governance. The study found that cities with good governance are more likely to be liveable than those with poor governance. Good governance is defined as the presence of a strong, independent judiciary, a free press, and a government that is accountable to its citizens.

INCLUSIVE SOCIETY

The study also found that cities that are inclusive and offer a high quality of life for all their residents are more likely to be cooler than those that are not. Inclusive societies are those that provide equal opportunities for all their citizens, regardless of their race, ethnicity, or social class.

Saving Jakarta from flooding

STRAJES UNDERWAY TO CLEAN UP FLOOD-PRONE CIBIRU RIVER, BUT SQUATERS WIT BUDGE

As the city of Jakarta continues to expand, the Cibiru River, which flows through the city, is becoming increasingly polluted and overgrown. The government has launched a project to clean up the river, but the project has been delayed by the presence of squatters who have built their homes along the riverbank.

RECENT DEVELOPMENTS

The project to clean up the Cibiru River is a joint effort between the government and the private sector. The project involves the construction of a new bridge over the river, the removal of illegal structures, and the planting of trees along the riverbank.

THE RISE OF ROBOTS

ROBOT FOR HIGH-RISE REPAIRS

Researchers at the National Institute of Standards and Technology (NIST) have developed a robot that can perform high-rise maintenance tasks. The robot, called the "Climber," is a small, autonomous robot that can climb a vertical surface and perform tasks such as painting, sanding, and inspecting.

RESEARCH IN DEVELOPMENT

The Climber robot is a small, autonomous robot that can climb a vertical surface and perform tasks such as painting, sanding, and inspecting. The robot is controlled by a computer and can be programmed to perform a variety of tasks.

Cool way to transform Rochor's hot back alleys

PROPOSAL TO SHIFT SHEPHERDS' AIR-CON UNITS INTO ALLEYS, INTRODUCE OUTDOOR DINING

The Rochor district in Singapore is known for its hot and humid climate. A new proposal has been put forward to transform the hot back alleys of the district into cooler, more livable spaces. The proposal involves the installation of air conditioning units in the alleys and the introduction of outdoor dining areas.

PROPOSAL DETAILS

The proposal involves the installation of air conditioning units in the alleys and the introduction of outdoor dining areas. The units would be installed on the walls of the buildings, and the outdoor dining areas would be located in the alleys.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

HOME THE STRAITS TIMES

647 Forty things special about 7 years ago **75** **Traffic road safety warning**

Nothing random about 'familiar strangers'

RESEARCHERS MAP OUT PATTERNS OF COMMUTERS WHO MEET REGULARLY IN SINGAPORE

A new study has found that commuters who meet regularly in Singapore are more likely to be familiar with each other than those who do not. The study also found that commuters who meet regularly in Singapore are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that commuters who meet regularly in Singapore are more likely to be familiar with each other than those who do not. The study also found that commuters who meet regularly in Singapore are more likely to be environmentally conscious.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

This robot could be laying your floor tiles soon

ROBOT COULD BE LAYING FLOOR TILES SOON

A new robot has been developed that can lay floor tiles. The robot, called the "Tilebot," is a small, autonomous robot that can lay tiles on a flat surface. The robot is controlled by a computer and can be programmed to lay tiles in a variety of patterns.

ROBOT DETAILS

The Tilebot robot is a small, autonomous robot that can lay tiles on a flat surface. The robot is controlled by a computer and can be programmed to lay tiles in a variety of patterns.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

30 science

NEW TECHNOLOGY USES LESS ENERGY TO COOL

Beating back the heat with a conscience

KATHY CHENG kathycheng@enr.com.sg

technology considers factors such as surface temperature, humidity and air speed to cool particular spaces. This lowers overall temperature, using less energy than standard cooling systems.

The FCL is a joint effort between the National Research Foundation of Singapore and ETH Zurich. Researchers have set up a laboratory, known as BubbleZERO, to test the low energy systems. They say systems are mature and are now entering the implementation phase within Singapore's climatic and cultural context.

In June, the National Environment Agency and Building Construction Authority representatives from the Energy Efficiency Programme Office of Singapore visited the laboratory to study FCL's research.

Among the ideas discussed, using

President Tan looks for takeaways in Zurich

He tours Zurich lab showcasing work on flood management

BY YAMINEE YAPPA

President Tan Yong Poo visited the Zurich Laboratory for Flood Management (LFM) in Switzerland. The president was accompanied by a delegation of officials from the National Environment Agency and the Building Construction Authority.

The LFM is a joint effort between the National Research Foundation of Singapore and ETH Zurich. The laboratory is dedicated to research on flood management and the development of flood-resistant buildings.

President Tan was impressed by the research and the work of the LFM. He said that the research is very important for Singapore, which is a coastal city and is vulnerable to flooding.

President Tan looks for takeaways in Zurich

He tours Zurich lab showcasing work on flood management

BY YAMINEE YAPPA

President Tan Yong Poo visited the Zurich Laboratory for Flood Management (LFM) in Switzerland. The president was accompanied by a delegation of officials from the National Environment Agency and the Building Construction Authority.

The LFM is a joint effort between the National Research Foundation of Singapore and ETH Zurich. The laboratory is dedicated to research on flood management and the development of flood-resistant buildings.

President Tan was impressed by the research and the work of the LFM. He said that the research is very important for Singapore, which is a coastal city and is vulnerable to flooding.

Bamboo offers green building solution

S'pore Swiss lab hopes to harness material's strength and flexibility in reinforcing concrete

BY YAMINEE YAPPA

The Zurich Laboratory for Flood Management (LFM) is a joint effort between the National Research Foundation of Singapore and ETH Zurich. The laboratory is dedicated to research on flood management and the development of flood-resistant buildings.

The LFM is a joint effort between the National Research Foundation of Singapore and ETH Zurich. The laboratory is dedicated to research on flood management and the development of flood-resistant buildings.

The LFM is a joint effort between the National Research Foundation of Singapore and ETH Zurich. The laboratory is dedicated to research on flood management and the development of flood-resistant buildings.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

Putting a price on travel

TRAVELERS WILL BE CHARGED FOR USING PUBLIC TRANSPORTATION

A new study has found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

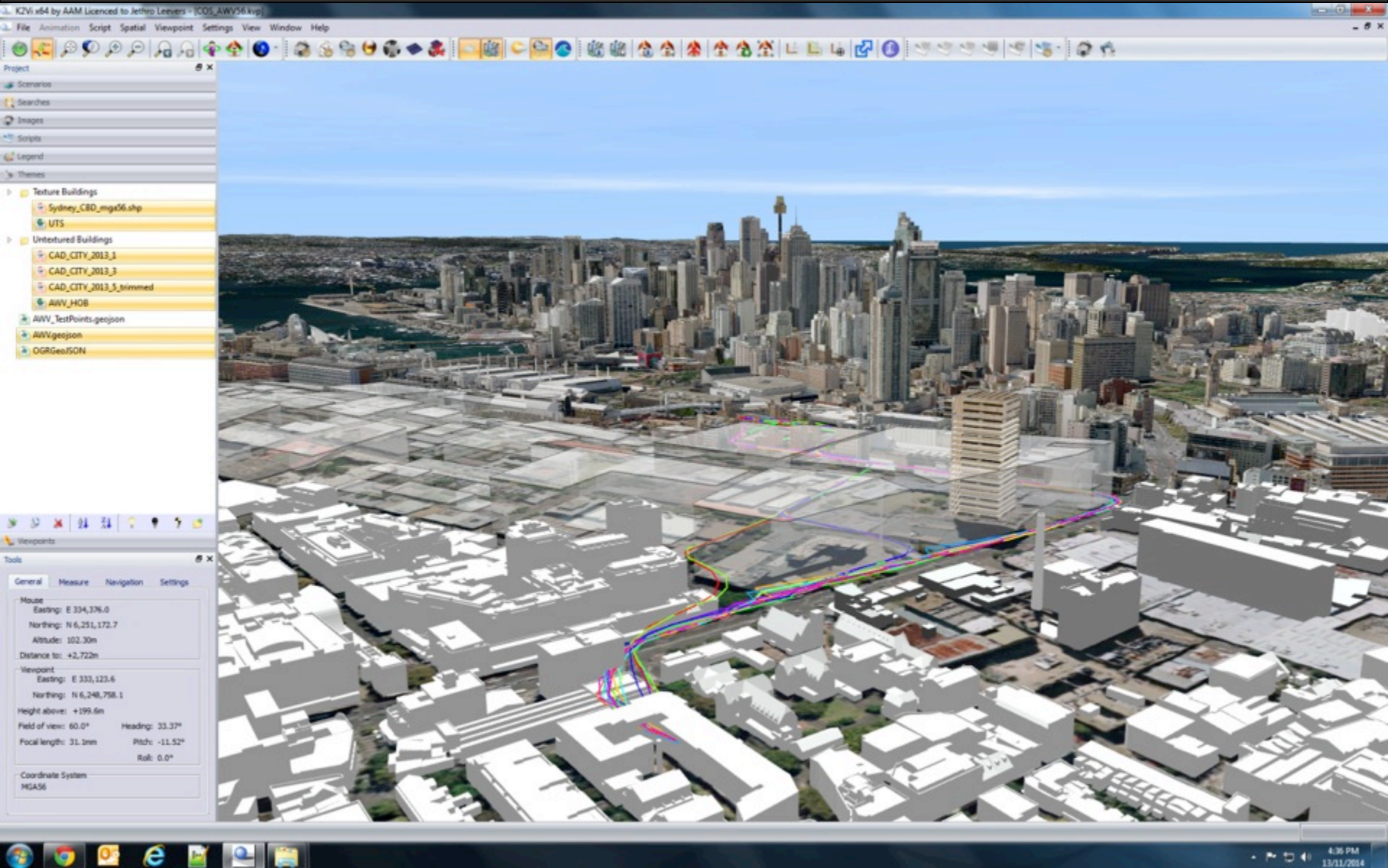
STUDY FINDINGS

The study found that travelers who use public transportation are more likely to be satisfied with their travel experience than those who do not. The study also found that travelers who use public transportation are more likely to be environmentally conscious.

Beyond Smart Cities

(SEC) SINGAPORE-ETH
CENTRE 新加坡-ETH
研究中心

(FCL) FUTURE
CITIES
LABORATORY 未来
城市
实验室



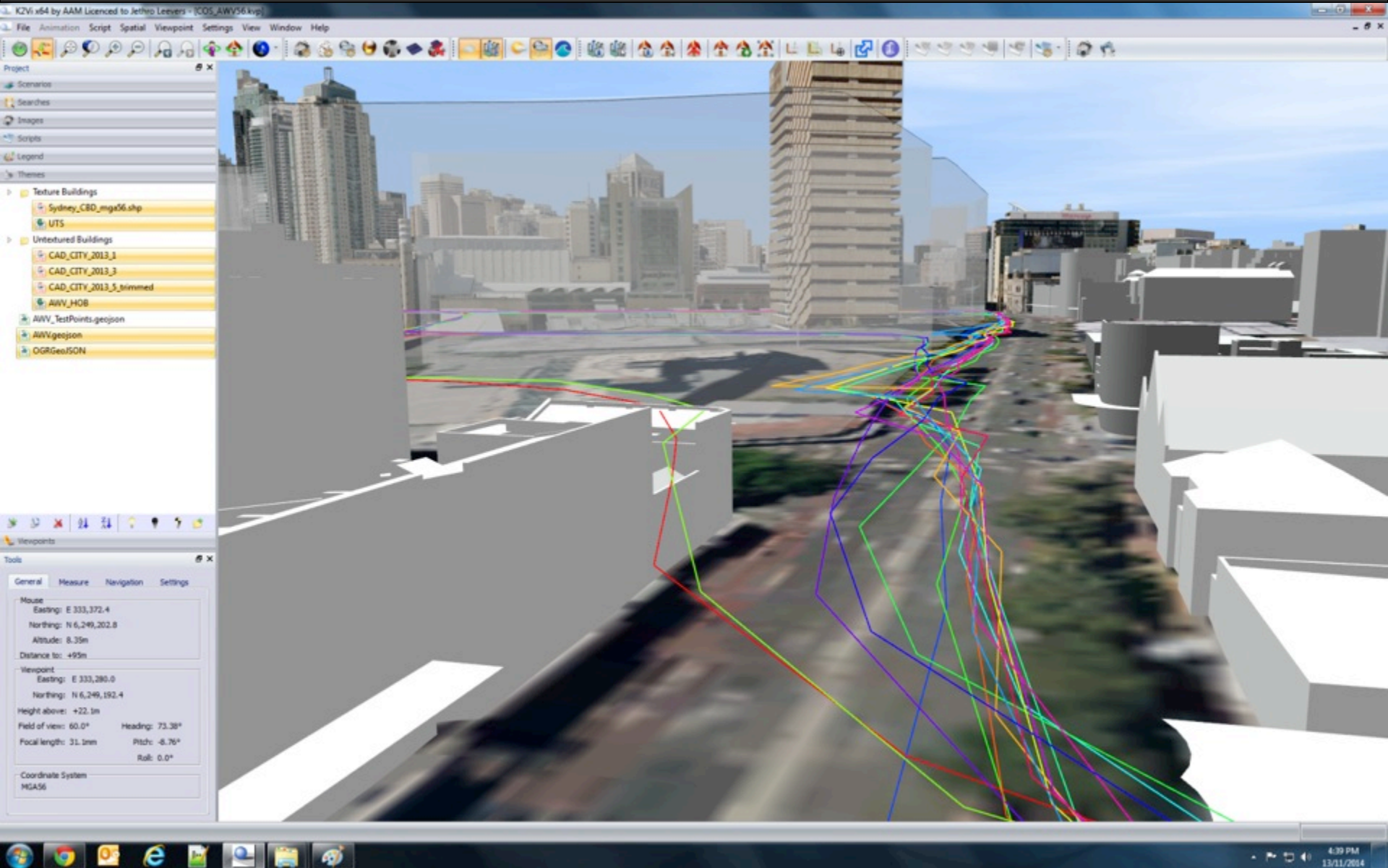
Beyond Smart Cities

(SEC) SINGAPORE-ETH
CENTRE

新加坡-ETH
研究中心

(FCL) FUTURE
CITIES
LABORATORY

未来
城市
实验室



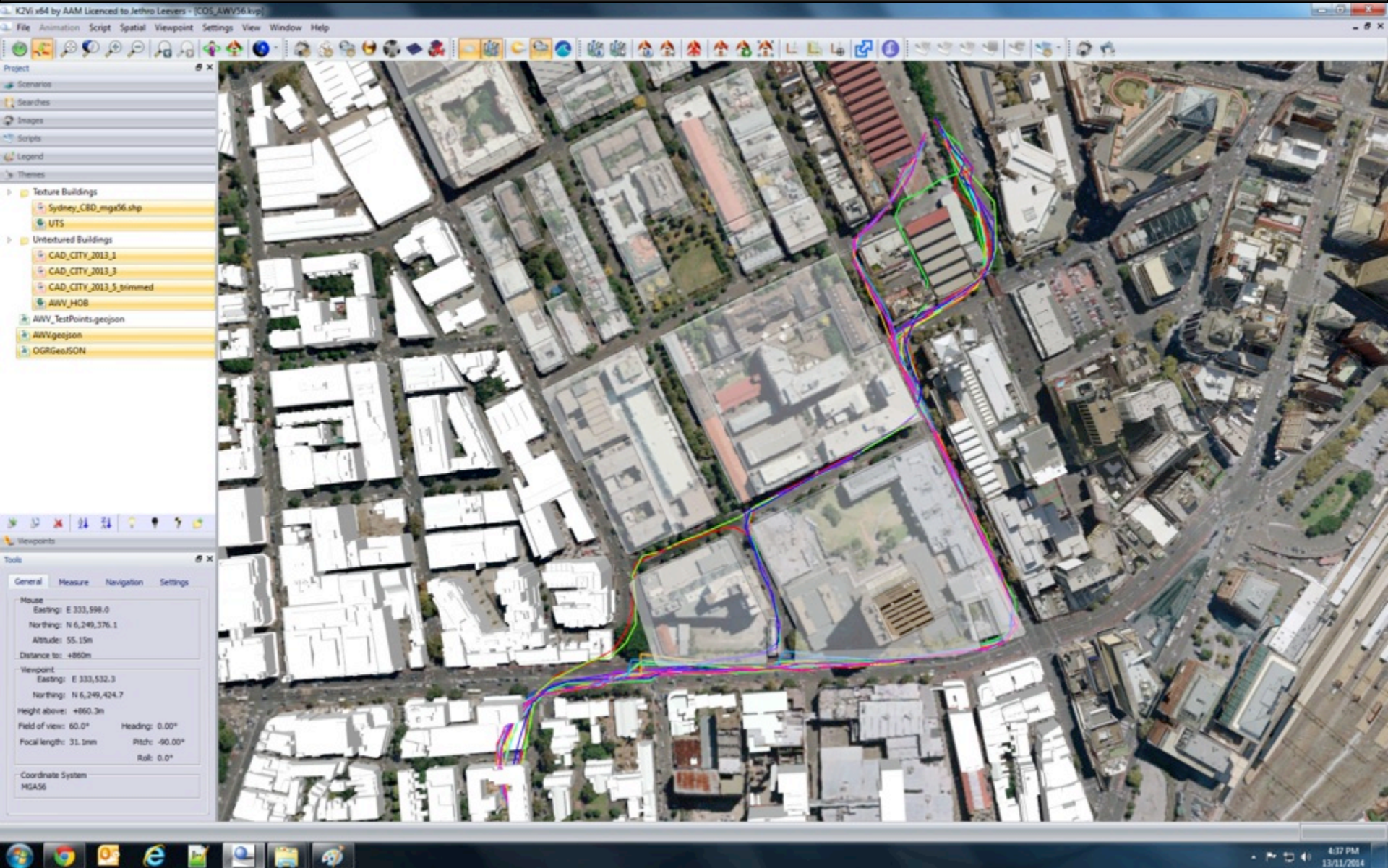
Beyond Smart Cities

(SEC) SINGAPORE-ETH
CENTRE

新加坡-ETH
研究中心

(FCL) FUTURE
CITIES
LABORATORY

未来
城市
实验室





Key Message:

Smart cities miss the human's or citizen's perspective.

Responsive and resilient cities are the new goal.

Take Away:

City labs are crucial to create sustainable cities, since they bring stakeholders together.

The background image shows a modern, multi-story building with a glass and concrete facade. The word "INNOVATION" is prominently displayed in large, dark, three-dimensional letters on the upper part of the building's facade. The building has a grid-like structure of windows and balconies. The sky is overcast and grey. In the foreground, there are some green leaves and a thin tree trunk on the left side.

ETH Zurich's Future Cities Laboratory in Singapore

Contact:

Dr. Matthias Berger
Singapore-ETH Centre
1 Create Way
#06-01 CREATE Tower
Singapore 138602

<http://www.futurecities.ethz.ch>
mberger@arch.ethz.ch