

# Meeting the dual challenges of Covid-19 and climate change

Chair: Nils Larsson

iiSBE, the International Initiative for a Sustainable Built Environment

29Oct20

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*Beyond 2020, Stage 2*

14:15-15:15, Monday November 02, 2020



## Panel Session, Nov. 2, 14:15-15:15 CET

### Chair

Nils K. Larsson, Executive Director of the International Initiative for a Sustainable Built Environment (iiSBE)

### Speakers

Greg Foliente, Professor, Dep't of Infrastructure Engineering, Uni Melbourne, Australia

Simone Mangili, Strategic Planning and Sustainability Policy, City of Turin

Jiri Skopek, architect and planner, Toronto, Canada

Markus Berchtold, consultant for spatial planning, Schwarzenberg, Austria

### Agenda

14:15-14:20	NL	Introductions and agenda overview
14:20-14:30	NL	Introduction to Covid-19 and climate actions
14:30 to 15:00	panellists	4 panellists with NL as moderator Individual 7-minute views on meeting both challenges
15:00 to 15:15	All	Looking for synergistic urban actions

- A. Introduction
- B. The Covid-19 Pandemic
- C. Climate Action
- D. Panelist viewpoints
- E. Integrated Actions
- F. Conclusions

## Introduction

- All countries around the world are now facing two major crises: the impacts of climate change and the effects of the Covid-19 pandemic
- Climate change is recognized in most countries as a phenomenon that is creating disaster on many fronts.
- The Covid-19 pandemic has been a global health, social and economic disaster. A vaccination program is not likely to be widely implemented until late 2021, and other novel viruses are also likely to emerge.



## Introduction

- Global economies have already been badly damaged by the pandemic, and a rebuilding program is seen by international institutions as requiring major investments.
- The massive costs of mitigation of and adaptation to climate change are becoming apparent and will rapidly mount.
- The need to address both crises offers great opportunities to integrate post-pandemic goals with those of climate action, and the next 3 to 5 years are our last chance to take strong action to deal with climate change.

# The Covid-19 Pandemic



Search by Country, Territory, or Area

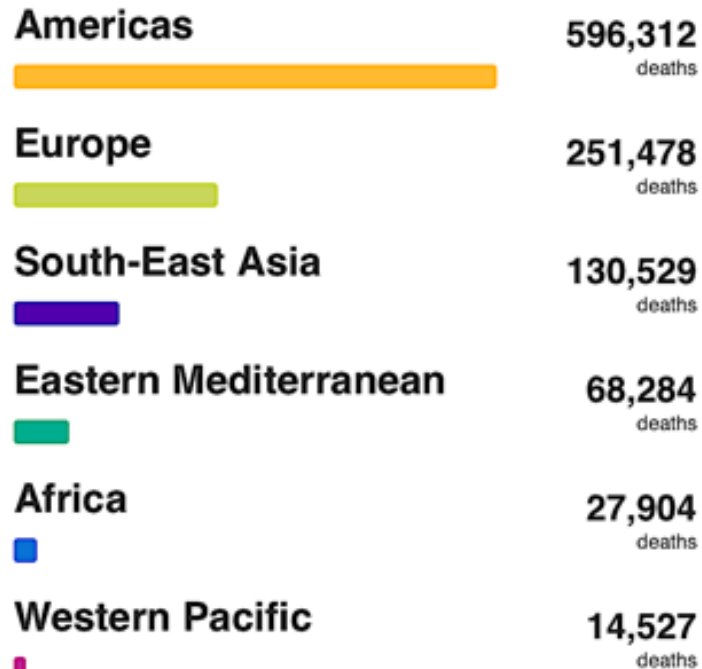
## WHO Coronavirus Disease (COVID-19) Dashboard

Data last updated: 2020/10/6, 3:07pm CEST

# The Situation



## Situation by WHO Region



Source: World Health Organization

▨ Data may be incomplete for the current day or week.



Daily

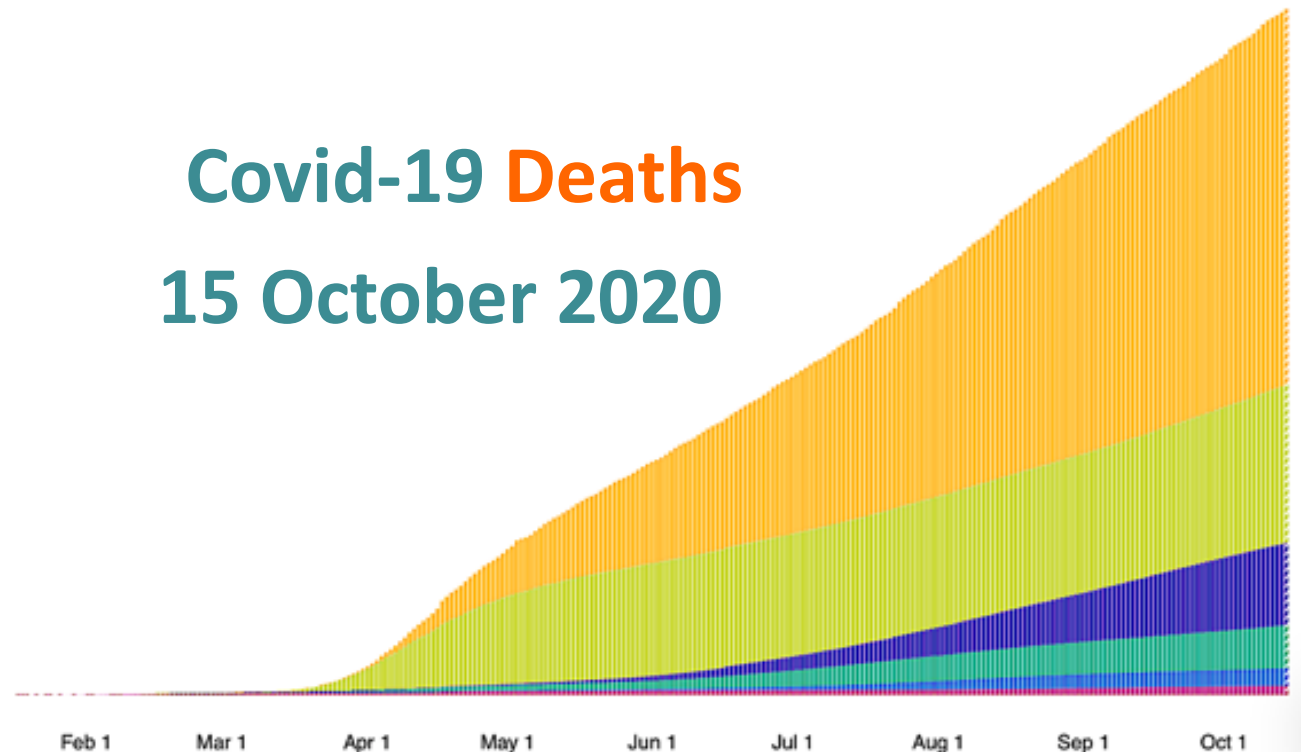
Weekly

Cases

Deaths

Count

## Covid-19 Deaths 15 October 2020



[https://covid19.who.int/?gclid=EAIaIQobChMI8LUuZOn6gIViY3ICh3V5QnrEAAYASAAEgKR-fD\\_BwE](https://covid19.who.int/?gclid=EAIaIQobChMI8LUuZOn6gIViY3ICh3V5QnrEAAYASAAEgKR-fD_BwE)

## The Covid-19 Pandemic

- The Covid-19 pandemic has revealed important conflicts between pandemic health requirements and the ability to satisfy these in urban areas or buildings of various occupancy types.
- Some requirements can be met with changes in building management or with minor renovations, but others demand more substantial changes which may not be easy to implement in the short term.
- Other issues are related to the urban scale, and there are even larger questions of national governments taking up the task of post-pandemic reconstruction.

## Covid-19 actions needed – policies and programs

- 1 Adapt to massive changes in work and formal education patterns that are causing an outflow of population to suburban and exurban areas.

Shifting work patterns: telework capacity by industrial sector, Canada 2019



Source: Statistics Canada, Labour Force Survey, 2019 and O\*Net.

## Covid-19 actions needed - policies and programs

2. Make use of urban areas and buildings made redundant by the pandemic:
  - a. Convert unused open parking spaces to parks, trees and open-air recreation facilities.
  - b. Convert surplus office building space to residential, educational or public uses.
  - c. Convert other surplus buildings, e.g. conference centres, gymnasias, shopping centres, parking garages or parts of airports to new uses.
3. Launch major low-income housing and commercial retail renovation programs as post-pandemic social equity and economic recovery measures.
4. Encourage natural and hybrid ventilation, Improve mechanical ventilation capacities, and increase outdoor air ratios in ventilation systems.

Actions 5 to 11 – see full presentation

## Covid-19 actions needed – design and construction

5. Provide all new dwelling units with private outdoor space, e.g. gardens, courts or balconies.
6. Adjust occupant densities in all non-residential buildings to support increased distancing and limits on occupant density.
7. Provide neighbourhood fever clinics and residential facilities to meet short-term isolation requirements.
8. Specify a high degree of flexibility of internal functions and systems in new residential and institutional buildings.
9. In large buildings with public access, establish building entry check points, provide scanning and monitoring of occupants' health status and movements within the building.
10. Add lift capacities to ensure reduced passenger densities.
11. Monitor wastewater flows for Covid-19 at the level of urban blocks or larger buildings.

# Planning for post-pandemic recovery

A paper summarizing a survey of 231 central bank officials, finance ministry officials and other experts from G20 countries, suggests that the pandemic has *..precipitated a major increase in the role of the state... and that .. the crisis has also demonstrated that governments can intervene decisively once the scale of an emergency is clear and public support is present...\**

The authors propose three key insights for policy-makers...

- Recovery policies can deliver both economic and climate goals
- Co-benefits can be captured.
- Policy design (timeliness and flexibility) is important

\* Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J., and Zenghelis, D. (2020), *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Smith School Working Paper 20-02.



# Planning for post-pandemic recovery

## Views of IEA and IMF on a sustainable recovery

- A report prepared by the International Energy Agency (IEA) and the International Monetary Fund (IMF) outlines their views on the prospects for an economic recovery.
- Regarding buildings...*More than 25 million jobs across the sector have been lost or are at risk in 2020. However, measures to improve the efficiency of buildings and appliances could be implemented quickly, in some cases with very short payback periods, creating 10-15 jobs per million dollars invested.*
- *Average annual energy retrofit rates in buildings are currently less than 1% in most major markets, which is well below the level required to achieve sustainability objectives.*

# Planning for post-pandemic recovery

## Views of IEA and IMF on a sustainable recovery

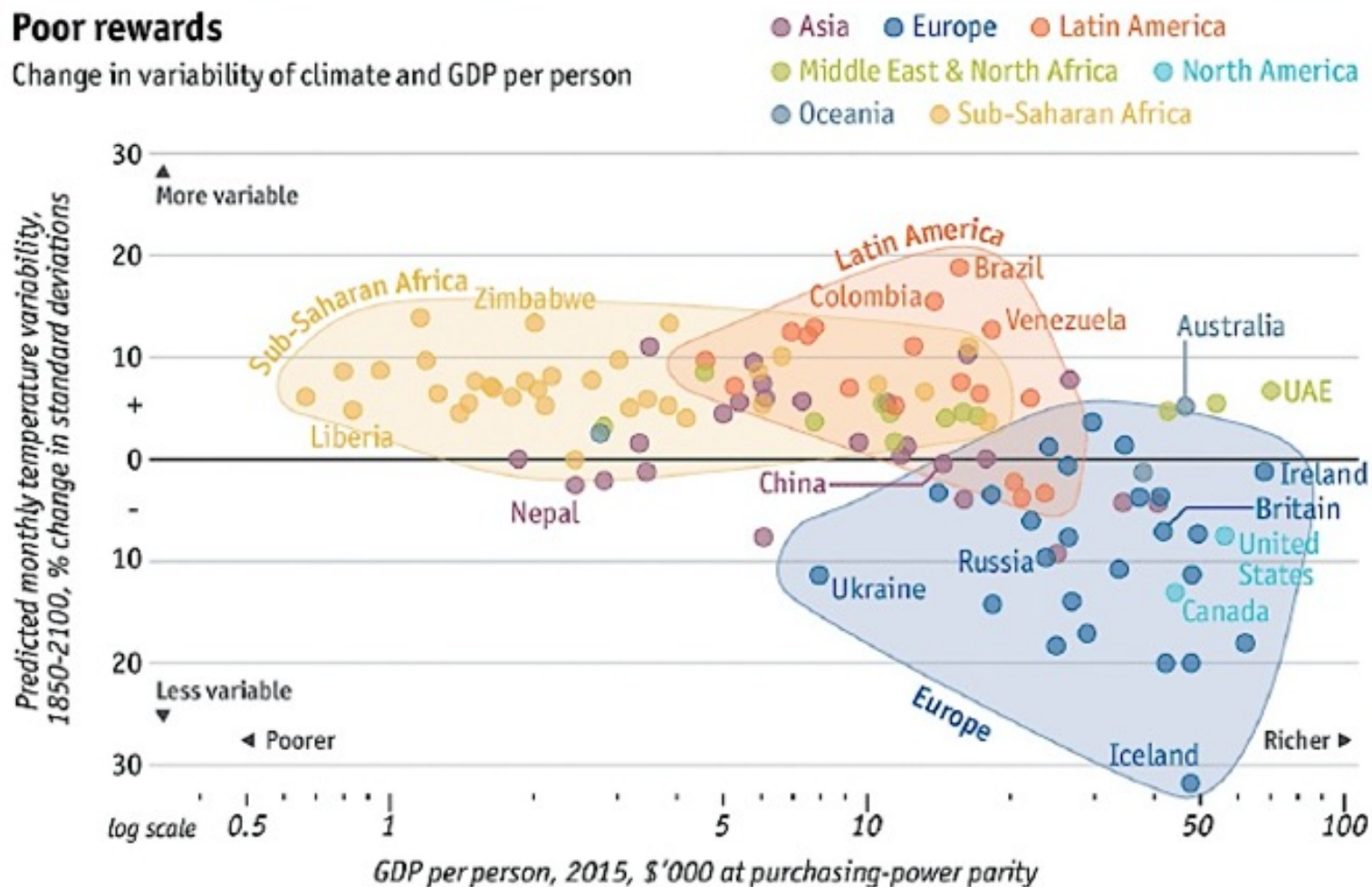
- *Suggested policy approaches to address the current Covid-19 crisis... include:*
  - *Target efficiency improvement measures on ... low-income households, small businesses and hotels.*
  - *Use public procurement to catalyse activity, for example by commissioning efficiency retrofits of public assets such as social housing, schools, offices and healthcare facilities.*
  - *Provide guarantees to encourage energy service companies to invest in retrofits.*
  - *Accelerate or expand existing and planned efficiency programmes.*

# Climate Action

Climate in developing countries will become far more variable

## Poor rewards

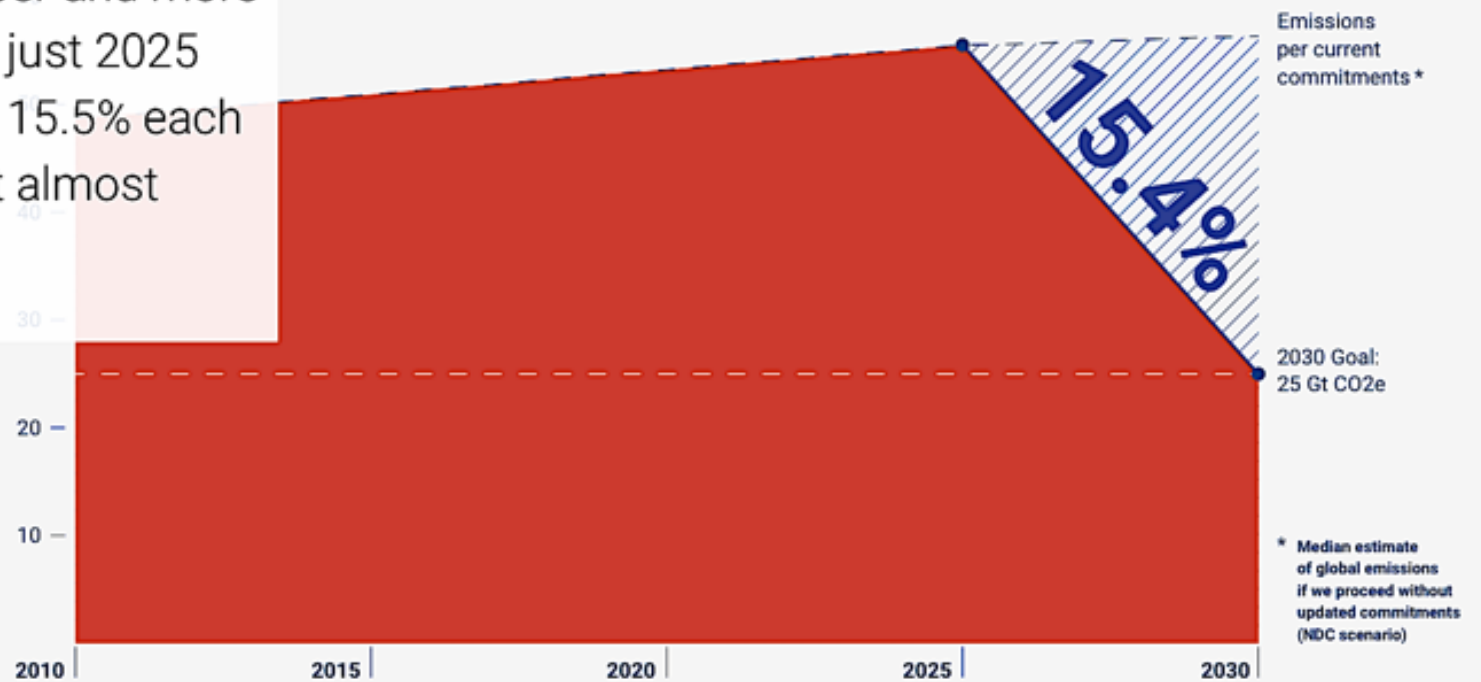
Change in variability of climate and GDP per person



Source: "Climate models predict increasing temperature variability in poor countries", by Sebastian Bathiany, Vasilis Dakos, Marten Scheffer and Timothy M. Lenton, *Science Advances*, May 2018

## Annual emission reductions needed by **2025** for a 1.5°C maximum rise

Every day we delay, the steeper and more difficult the cuts become. By just 2025 the cut needed would be 15.5% each year, making the 1.5°C target almost impossible.



*Emissions Gap Report 2019, UN Environment*

## Proposed key climate actions

Based on current trends and climate change impacts to date, the following actions are needed if we are to minimize any increase in ambient temperatures above 1.5°C.

1. Protect critical facilities and infrastructure (urban transport, emergency services, hospitals etc.) from climate change impacts.
2. Establish multi-stakeholder climate action authorities at national and local levels to establish relevant guidelines and to provide loans and grants for high-performance retrofits.
3. Support a shift from private to public transport.

## Proposed key climate actions

4. Establish neighbourhood action strategies and performance targets.
5. Adjust VAT rates to provide incentives for renovation and disincentives for new construction
6. Freeze new construction in high-risk areas and limit new development in other areas
7. Launch deep green renovation programs to ensure high performance and low GHG emissions
8. Climate action items 8 to 18 – see full presentation.

## Proposed key climate actions

8. Introduce incentives to move rapidly towards zero use of fossil fuels and to promote clean energy and renewables.
9. Mitigate urban heat island effect by increasing areas of parks and urban forests.
10. Encourage urban agriculture for local residents to reduce transport emissions and to increase neighbourhood access to fresh produce.
11. Provide short-term housing for population groups relocated by climate change impacts.
12. Establish refuge centres in low-income neighbourhoods for use during climate emergencies.



## Other proposed climate actions

13. Develop thermal-solar-greywater system synergies in groups of buildings.
14. Limit peak electrical demand to minimize need for new generating capacity.
15. Minimize embodied energy and lifecycle emissions in new construction.
16. Ensure very high operating efficiencies of new buildings.
17. Strengthen equipment and appliance efficiencies.
18. Establish public building performance databases so that we can measure progress.

# Panelist Viewpoints

**Prof. Greg Foliente** is Enterprise Professor in the Melbourne School of Engineering and Deputy Director of the Un Melbourne's Centre for Disaster Management and Public Safety (CDMPS). He leads interdisciplinary and trans-disciplinary research, education, consulting and collaboration initiatives that advance innovation in urban systems and built environments, with a primary focus on improved sustainability, liveability and resilience.

**Simone Mangili**, Strategic Planning and Sustainability Policy, City of Turin

**Jiri Skopek** is an architect and planner. He was the original creator of *Green Globes* environmental assessment. He is vice-chair of *Districts 2030 Network Board of Governors*, Chair of *Sustainable Buildings Canada*, and is on *ASHRAE Vision 2030* committee. He serves on the US National Institute of Science and Technology's *Smart Building SuperCluster* initiative and contributed to a *Smart Building Standard* under the Telecommunication Industry Association (TIA) and UL.

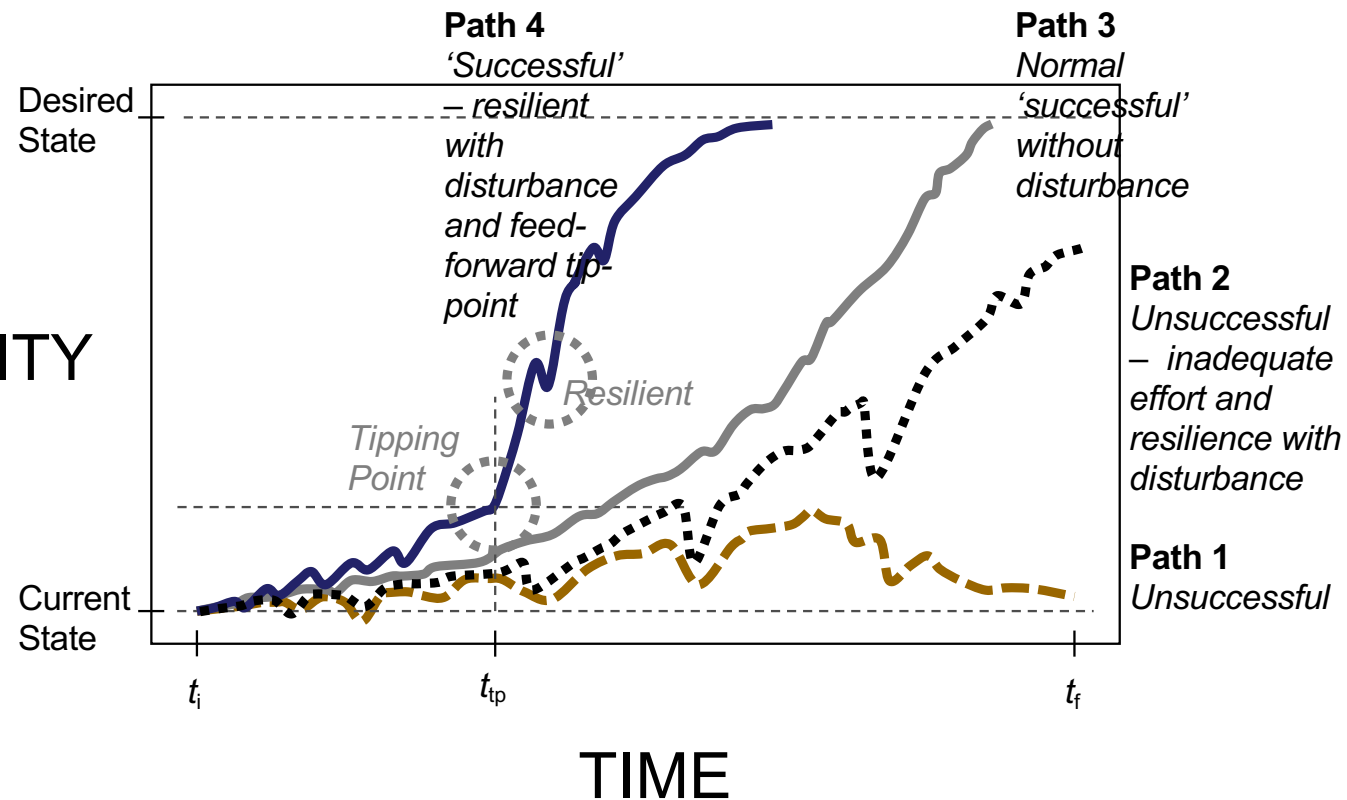
Mag. DI **Markus Berchtold** Ph.D., full study in international management and in spatial planning, doctorate in geography. Founder and managing director of heimat® 2005 | engineering office and generally sworn and judicially certified expert for spatial planning | systemic management consultancy

# Resilient Pathways to Sustainability

Greg Foliente



## SUSTAINABILITY POTENTIAL



After: Foliente, G., Rodger, A., Blutstein, H. and Wang, X. 2007. "Urban sustainability transition – A 'tipping point' approach", Procs. State of Australian Cities Conference SOAC2007, Adelaide, 28-30 November 2007



Prof G  
Foliente

## Key Points

Greg Foliente

- Built environment stakeholders need to be prepared for **concurrent hazards and "perfect storms"**, including more intense and/or frequent extreme events
- Resources are limited, and time is limited. Thus, we need to be very **strategic in resilience planning and investments**
- For example, governments need to provide industry incentives and direct spending on measures that improve the performance and sustainability of built form (e.g. net-zero/positive for new buildings and deep retrofit for existing) while addressing social inequality (e.g. focusing on social housing, improved accessibility & mobility)
- Disaster impacts (from climate change or pandemic) are asymmetric; worst hit are always the **most vulnerable members of society**. Protecting and providing for them contribute to both sustainability and resilience.



Greg Foliente

## Sustainable Development



*“Leave no one behind”*



## Resilience Thinking



*“Building back stronger”*



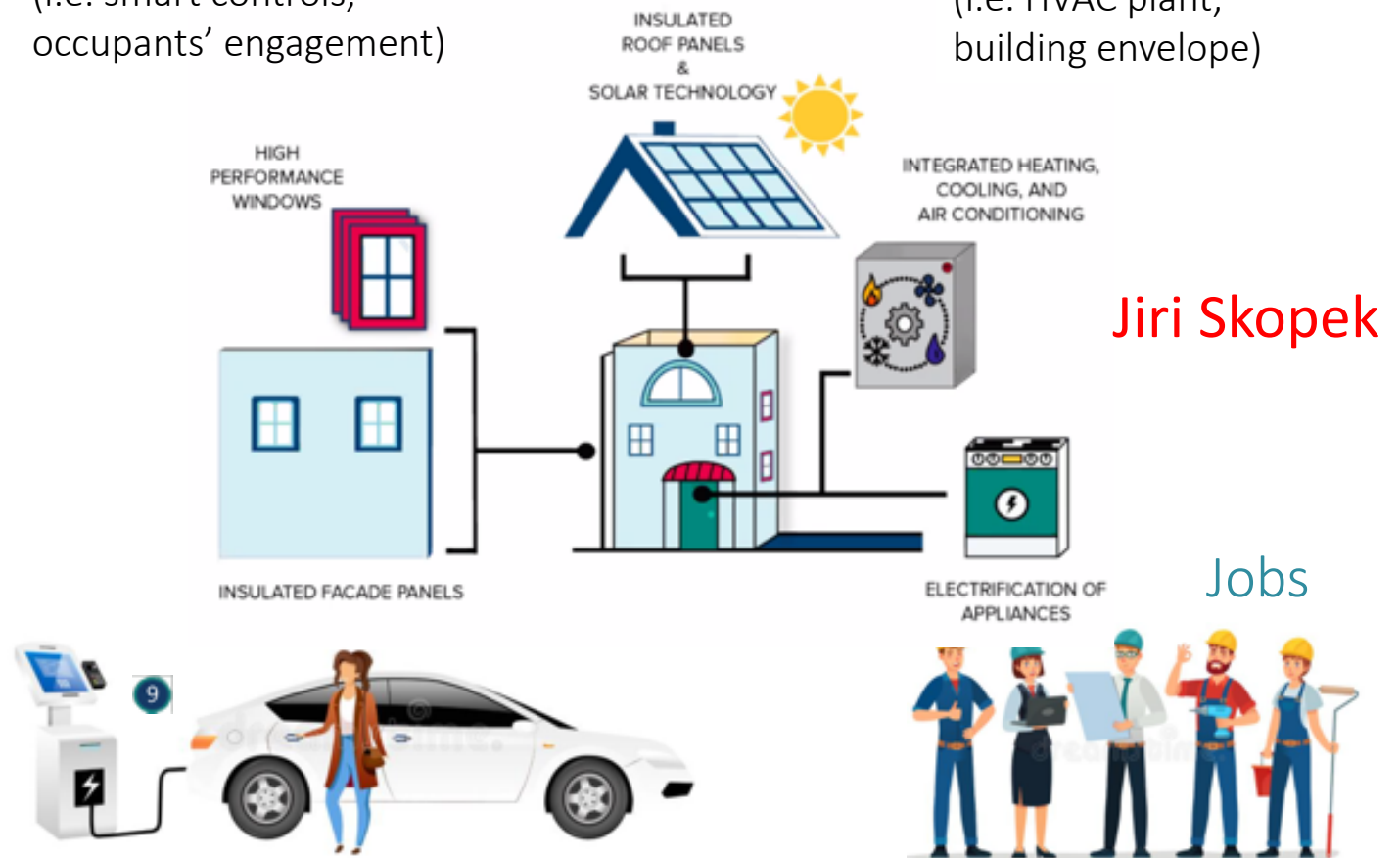
From: CDMPS\*. 2018. A Blueprint for Disaster Management RD&D Supporting the Sustainable Development Goals. Melbourne: Centre for Disaster Management and Public Safety, The University of Melbourne, Australia. (\*Note: Primary authors: M. Rabiee, G. Foliente and A. Rajabifard); <https://www.unimelb.edu.au/cdmeps/sdg-blueprint>

# Response to climate change & COVID 19 - Buildings

## Comprehensive (Deep) Building Retrofit- Decarbonization

Operational aspects  
(i.e. smart controls,  
occupants' engagement)

Capital investments  
(i.e. HVAC plant,  
building envelope)

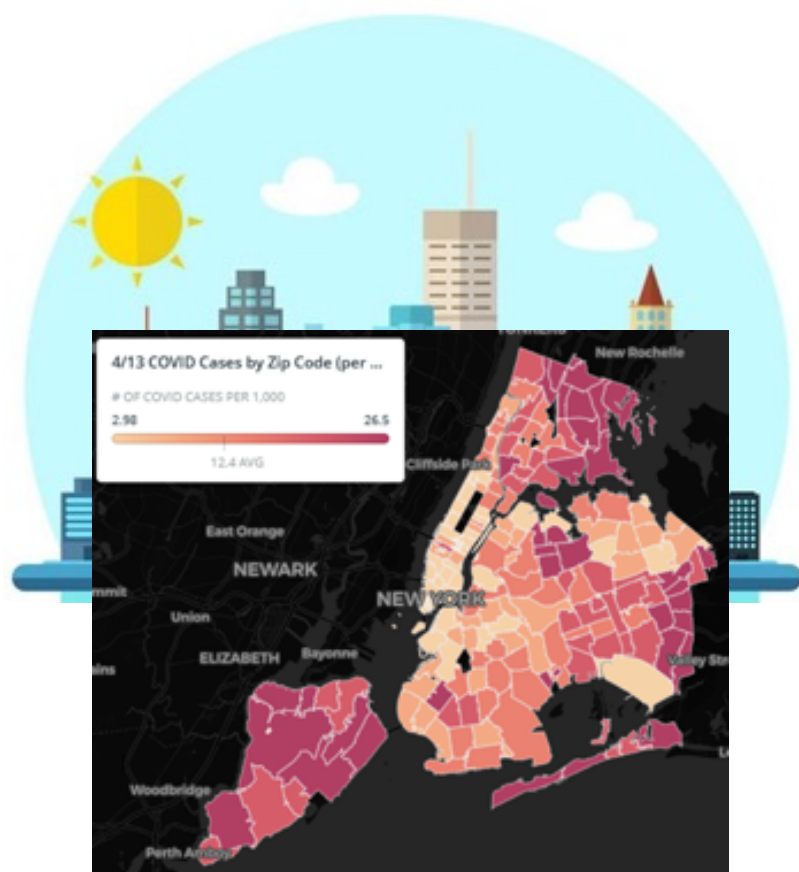


Jiri Skopek



# Response to COVID 19

Jiri Skopek





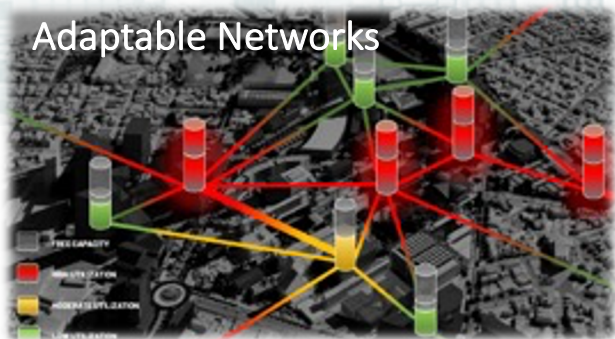
# Response to COVID 19 & Climate Change – Infrastructure

## 1. Healthy



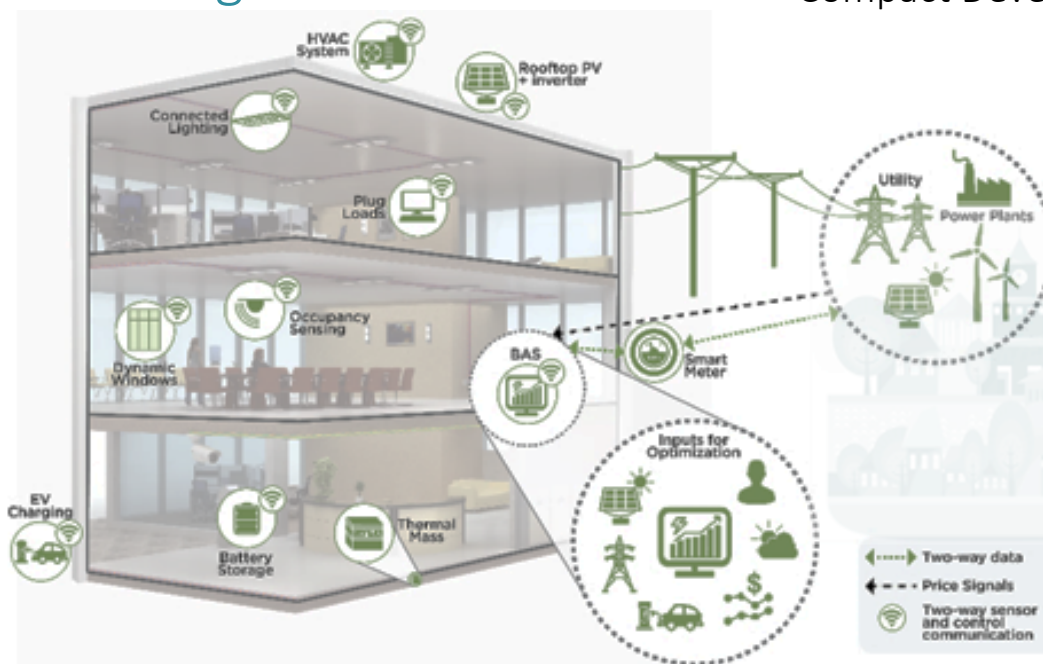
## 2. Smart city

Adaptable Networks



## 3. Smart Grid-Interactive Buildings & Communities

Mixed-used & income  
Compact Development



## 4. Rapid Transport

Jiri Skopek





# Planning for a resilient Turin in the era of COVID-19



Simone Mangili





# 01 il sistema del verde



Torino  
Greenprint

## Legenda

- Viabilità
- Aree verdi ricreative
- Aree verdi (pubbliche e private)
- Aree ad uso agricolo (pubbliche e private)
- Aree boschive (pubbliche e private)
- Fiumi, laghi e corsi d'acqua

Estensione territoriale: 130 km<sup>2</sup>

37% della superficie del Comune è costituita da aree verdi (circa 48 km<sup>2</sup>)

55,43 m<sup>2</sup> di verde per abitante

Aree verdi: 25%

Aree ad uso agricolo: 5%

Aree boschive: 7%



## 02 il verde comunale



Torino  
Greenprint

### Legenda

- Viabilità
- ▨ Aree verdi ricreative
- Aree verdi di proprietà della Città di Torino
- Aree ad uso agricolo di proprietà della Città di Torino
- Aree boschive di proprietà della Città di Torino
- Fiumi, laghi e corsi d'acqua



Aree verdi pubbliche e private:  
32.929.419 m<sup>2</sup>

Aree verdi di proprietà della Città:  
16.024.573 m<sup>2</sup> (49% del totale)

Aree ad uso agricolo pubbliche e private:  
5.871.137 m<sup>2</sup>

Aree ad uso agricolo di proprietà della Città:  
1.893.776 m<sup>2</sup> (32% del totale)

Aree boschive pubbliche e private:  
9.561.947 m<sup>2</sup>

Aree boschive di proprietà della Città:  
319.669 m<sup>2</sup> (3% del totale)



## 05 il verde ricreativo



Torino  
Greenprint

### Legenda

- Viabilità
- Aree verdi ricreative
- Aree cimiteriali, infrastrutturali e produttive industriali
- Fiumi, laghi e corsi d'acqua

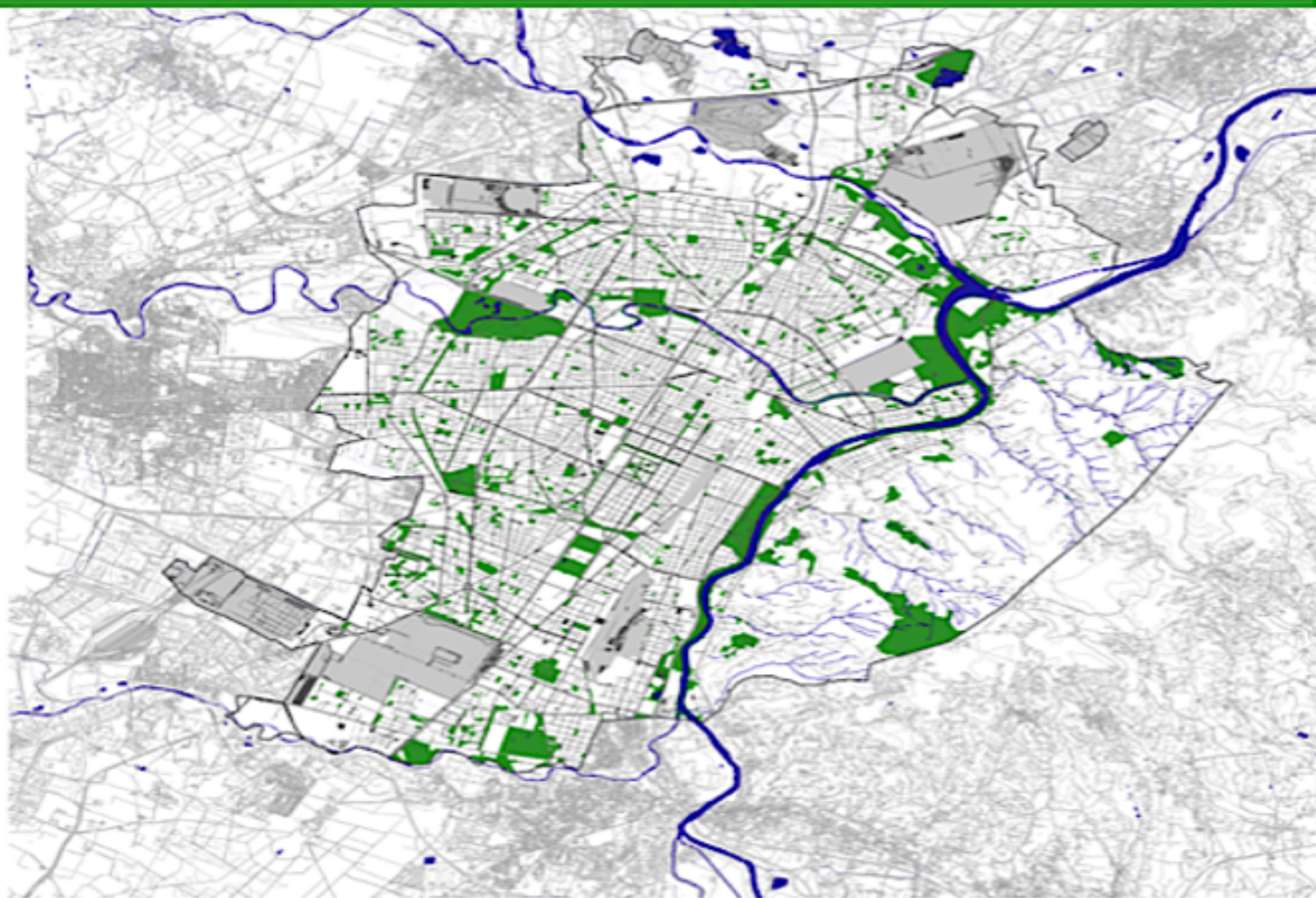
Aree verdi ricreative: aree verdi pubbliche comunali liberamente accessibili e fruibili dai cittadini per il passeggio, le attività sportive libere, il gioco, il relax.

517 aree verdi ricreative per un totale di 11.095.526 m<sup>2</sup>

Aree verdi ricreative rappresentano 34% del totale delle aree verdi pubbliche e private

Percentuale copertura verde ricreativo su territorio cittadino: 8,5%

Disponibilità verde ricreativo per abitante: 12,72 m<sup>2</sup>/ab





## 06 il verde sotto casa (300m)



Torino  
Greenprint

### Legenda

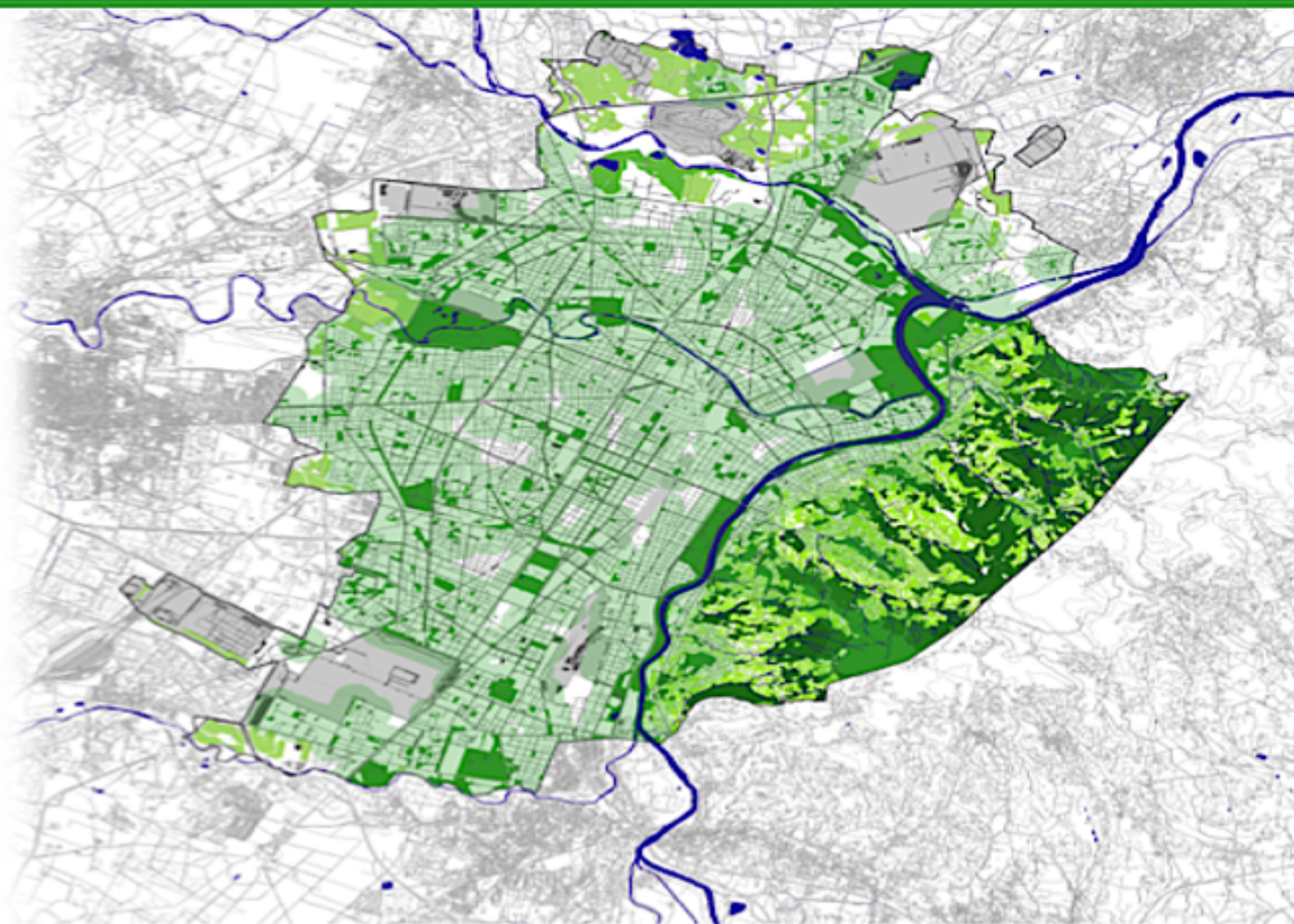
- Viabilità
- Aree verdi ricreative
- Accessibilità del verde ricreativo (raggio 300 m)
- Aree verdi collinari (pubbliche e private)
- Aree ad uso agricolo (pubbliche e private)
- Aree boschive (pubbliche e private)
- Area Basse di Stura
- Aree cimiteriali, infrastrutturali e produttive industriali
- Fiumi, laghi e corsi d'acqua

93% della popolazione residente in Torino abita entro 300 metri da un'area verde ricreativa

L'accesso a un'area verde entro 300 metri dalla propria casa è uno standard definito dalla Commissione Europea

69% della superficie della Città è coperta da buffer verde di accessibilità

Si è deciso di escludere dall'analisi l'area collinare in quanto non considerata parte del centro urbano dalla Commissione Europea





# 10 obiettivo 25 m<sup>2</sup> / abitante



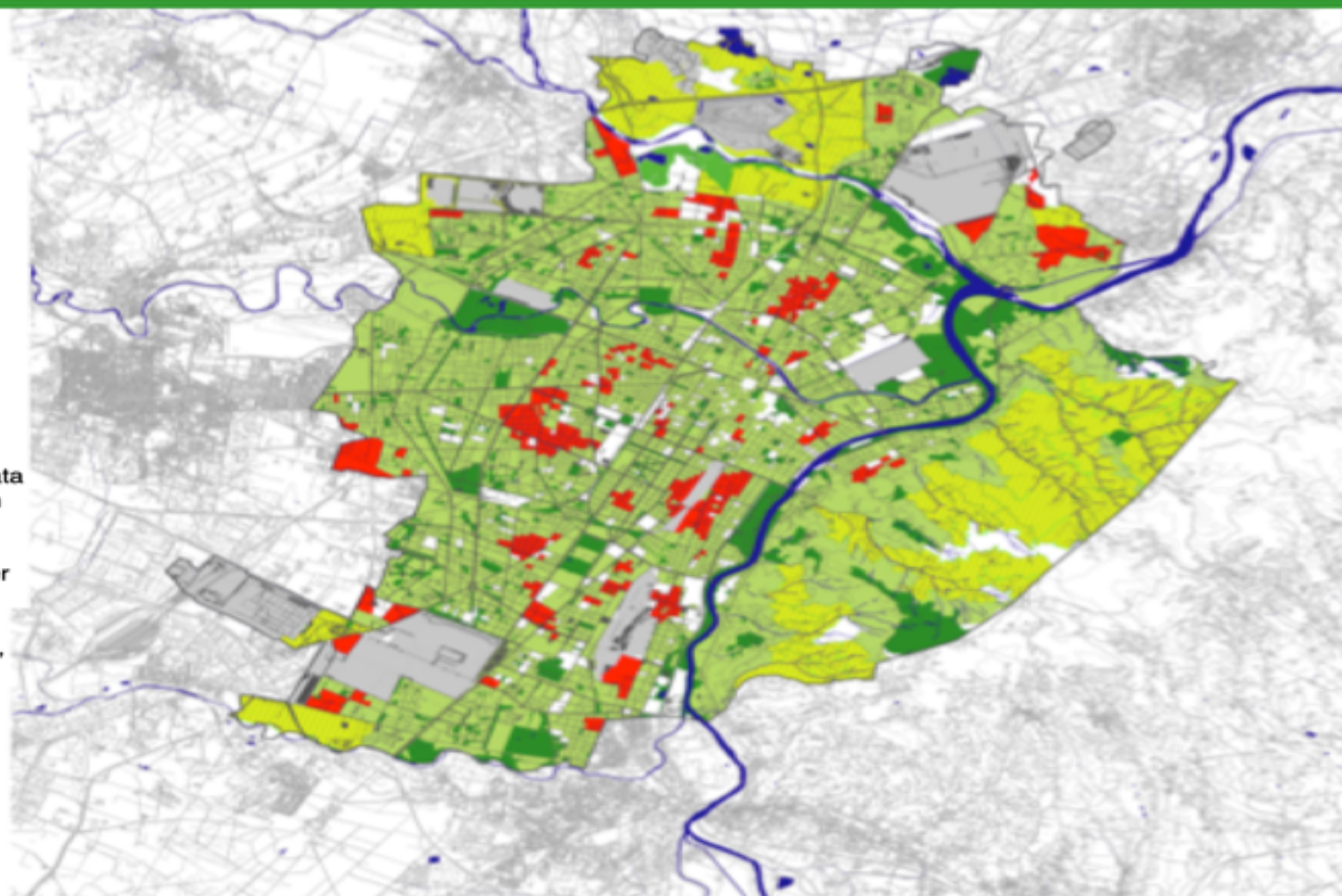
Torino  
Greenprint

## Legenda

- Viabilità
- Aree verdi ricreative
- Area Basse di Stura
- Aree cimiteriali, infrastrutturali e produttive industriali
- Fiumi, laghi e corsi d'acqua

Verde ricreativo (mq/ab)

- 0-25
- >25
- (aree a ridotta densità abitativa)



85% della popolazione risiede in un'area dotata di più di 25 m<sup>2</sup> di verde / abitante entro 300 m dalla propria residenza

Stabilendo un indicatore di 25 metri quadri per abitante l'analisi di accessibilità rileva che alcune aree della città, nonostante godano di una buona prossimità ad aree verdi ricreative, sono dotate di una quantità di verde per abitante relativamente inferiore ad altre aree

Questo non significa necessariamente una carenza di aree verdi in queste aree ma è un indicatore in più nella pianificazione della gestione delle aree e dei nuovi investimenti



# 16 obiettivo 25 m<sup>2</sup> / reddito medio



Torino  
Greenprint

## Legenda

- Viabilità
- Aree verdi ricreative
- Area Basse di Stura
- Aree cimiteriali, infrastrutturali e produttive industriali
- Fiumi, laghi e corsi d'acqua

### Reddito medio procapite (€)

- 10.000 - 12.500
- 12.500 - 15.000
- 15.000 - 17.500
- 17.500 - 20.000
- 20.000 - 22.500
- 22.500 - 25.000

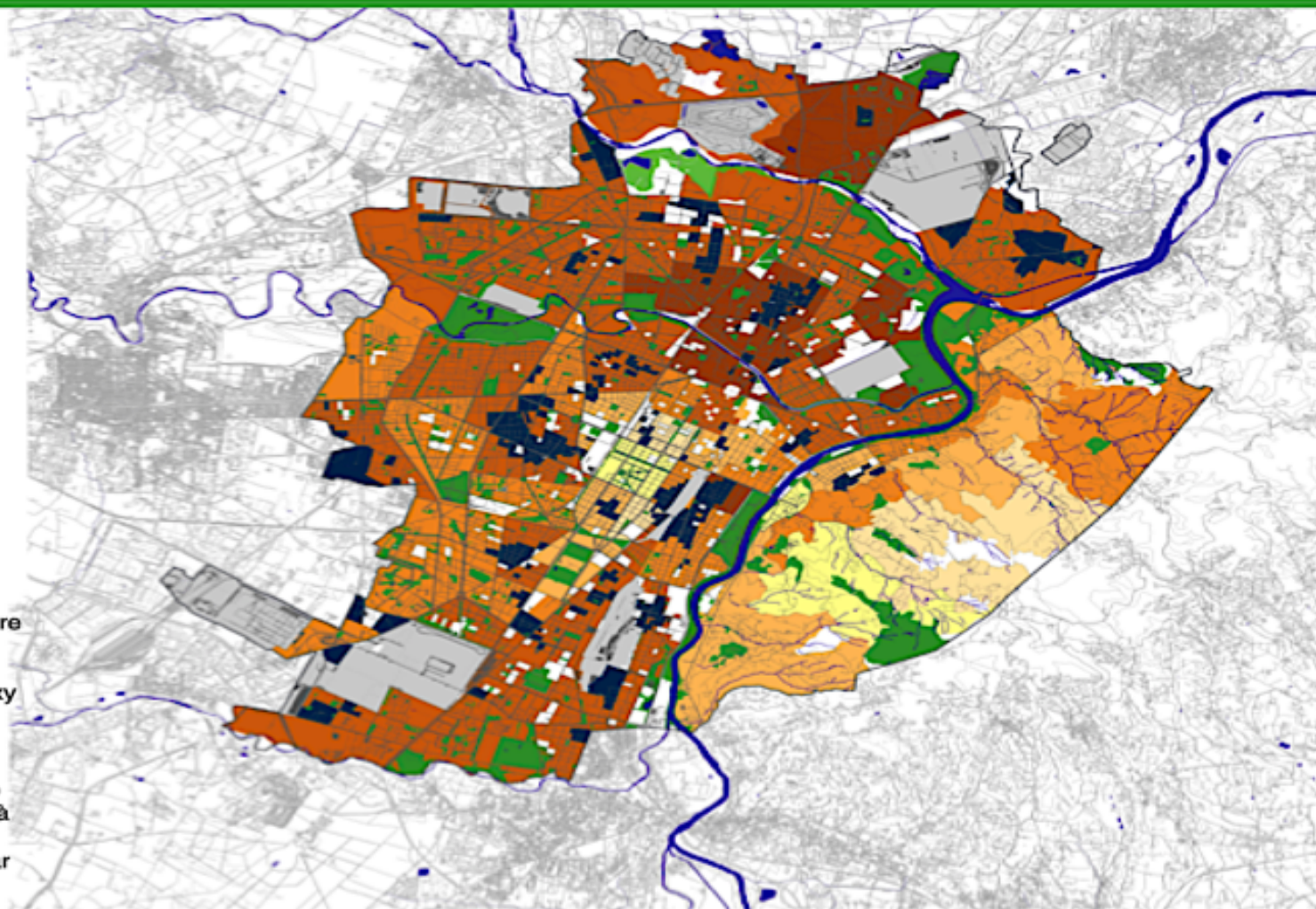
### Verde ricreativo (mq/ab)

- 0-25

Il verde ricreativo può essere un veicolo per favorire quelle attività di ricreazione e di aggregazione sociale positive utili a contrastare alcune vulnerabilità sociali

Il reddito medio può essere un indicatore proxy di vulnerabilità sociale

Qualora esistessero discrepanze relative tra zone della città, e le aree relativamente meno dotate coincidessero con fattori di vulnerabilità sociale, si possono valutare ulteriori investimenti nel verde ricreativo proprio per far fronte alle stesse vulnerabilità





# 20 aree verdi elementi ricreativi



Torino  
Greenprint

## Legenda

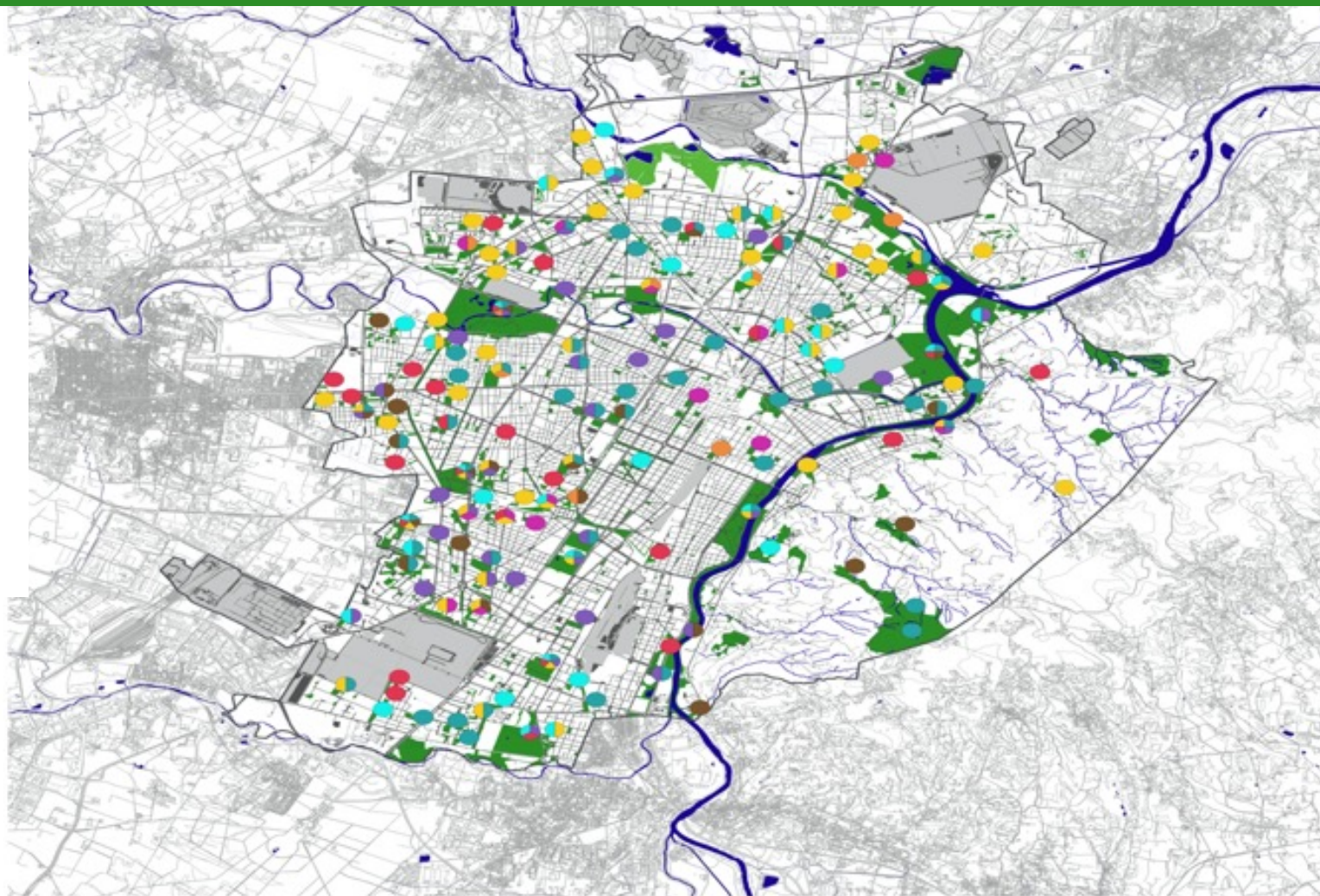
- Viabilità
- Aree verdi ricreative
- Area Basse di Stura
- Aree cimiteriali, infrastrutturali e produttive industriali
- Fiumi, laghi e corsi d'acqua

## Elementi ricreativi

- Aree fitness
- Piste da pattinaggio
- Campi sportivi
- Skatepark
- Zone attrezzate per eventi
- Campi da bocce
- Aree picnic
- Servizi igienici

## Elementi ricreativi

- Aree dotate di aree fitness 33
- Aree dotate di piste da pattinaggio 27
- Aree dotate di campi sportivi 56
- Aree dotate di skatepark 15
- Aree dotate di zone attrezzate per eventi 9
- Aree dotate di campi da bocce 34
- Aree dotate di aree picnic 22
- Aree dotate di servizi igienici 53





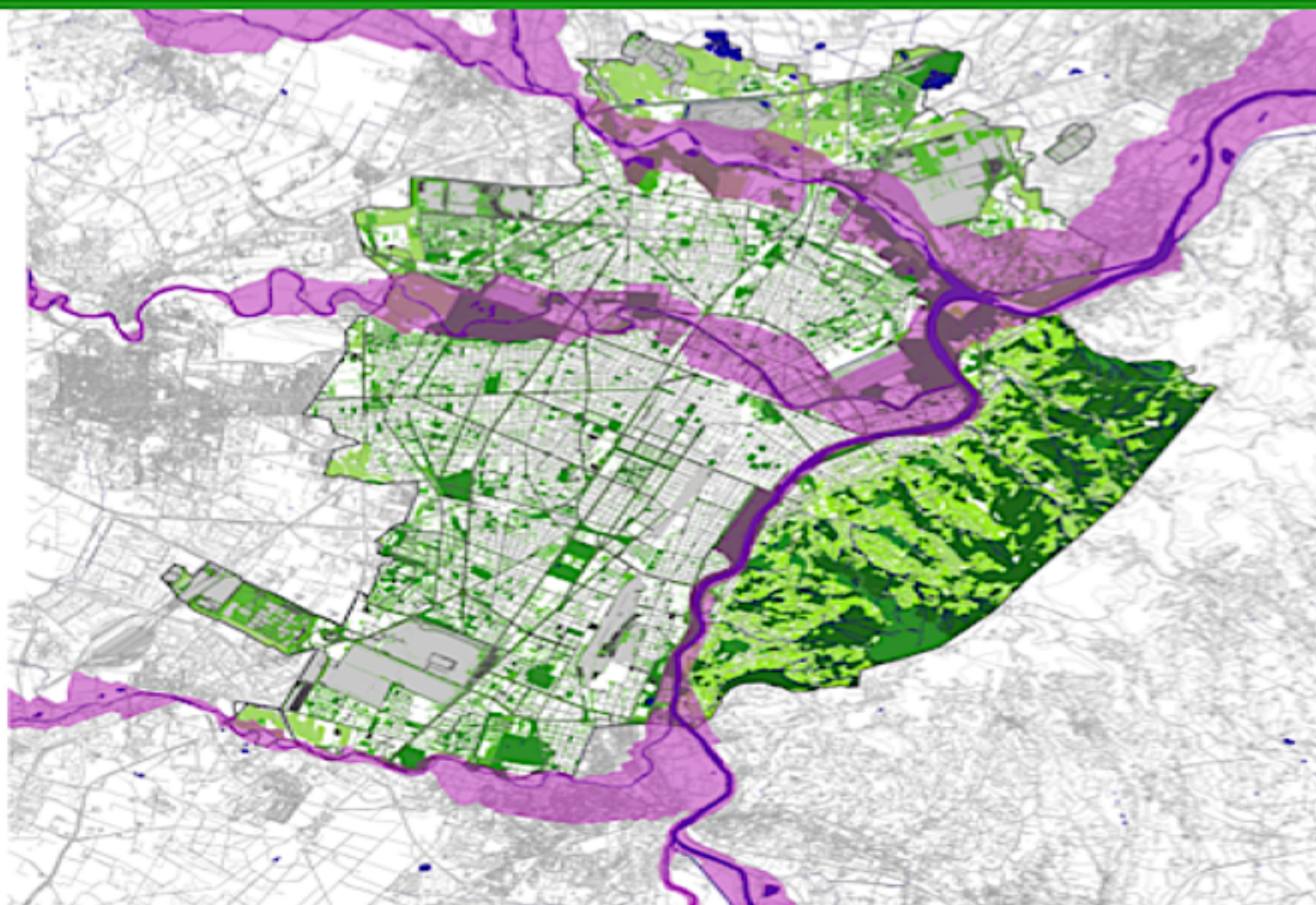
# 48 corridoi ecologici



Torino  
Greenprint

## Legenda

- Viabilità
- Aree verdi ricreative
- Aree verdi (pubbliche e private)
- Aree verdi collinari (pubbliche e private)
- Aree ad uso agricolo (pubbliche e private)
- Aree boschive (pubbliche e private)
- Area Basse di Stura
- Corridoi ecologici (fascia C PAI)
- Aree cimiteriali, infrastrutturali e produttive industriali
- Fiumi, laghi e corsi d'acqua





## 62 rischio isole di calore urbano



Torino  
Greenprint

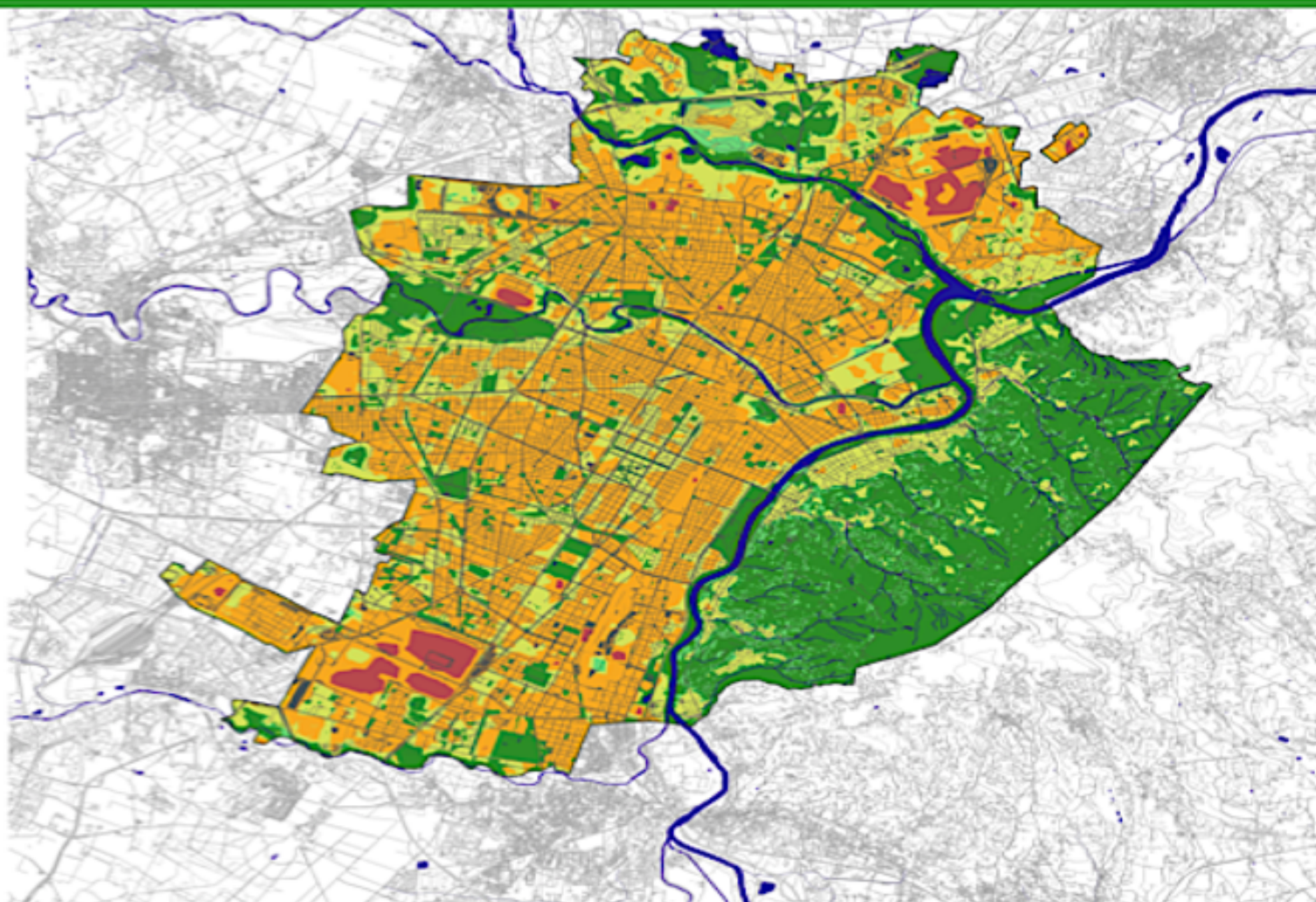
### Legenda

- Viabilità
- Aree verdi ricreative
- Aree naturali e seminaturali
- Fiumi, laghi e corsi d'acqua

### Rischio Urban Heat Island

- Rischio nullo
- Rischio basso
- Rischio medio
- Rischio elevato

Le analisi svolte all'interno del Progetto Life DERRIS evidenziano i fenomeni di isole di calore sul territorio comunale





## 63 NBS e rischio isole di calore basso



Torino  
Greenprint

### Legenda

- Viabilità
- Aree verdi ricreative
- Aree naturali e seminaturali
- Superfici impermeabilizzate
- Fiumi, laghi e corsi d'acqua

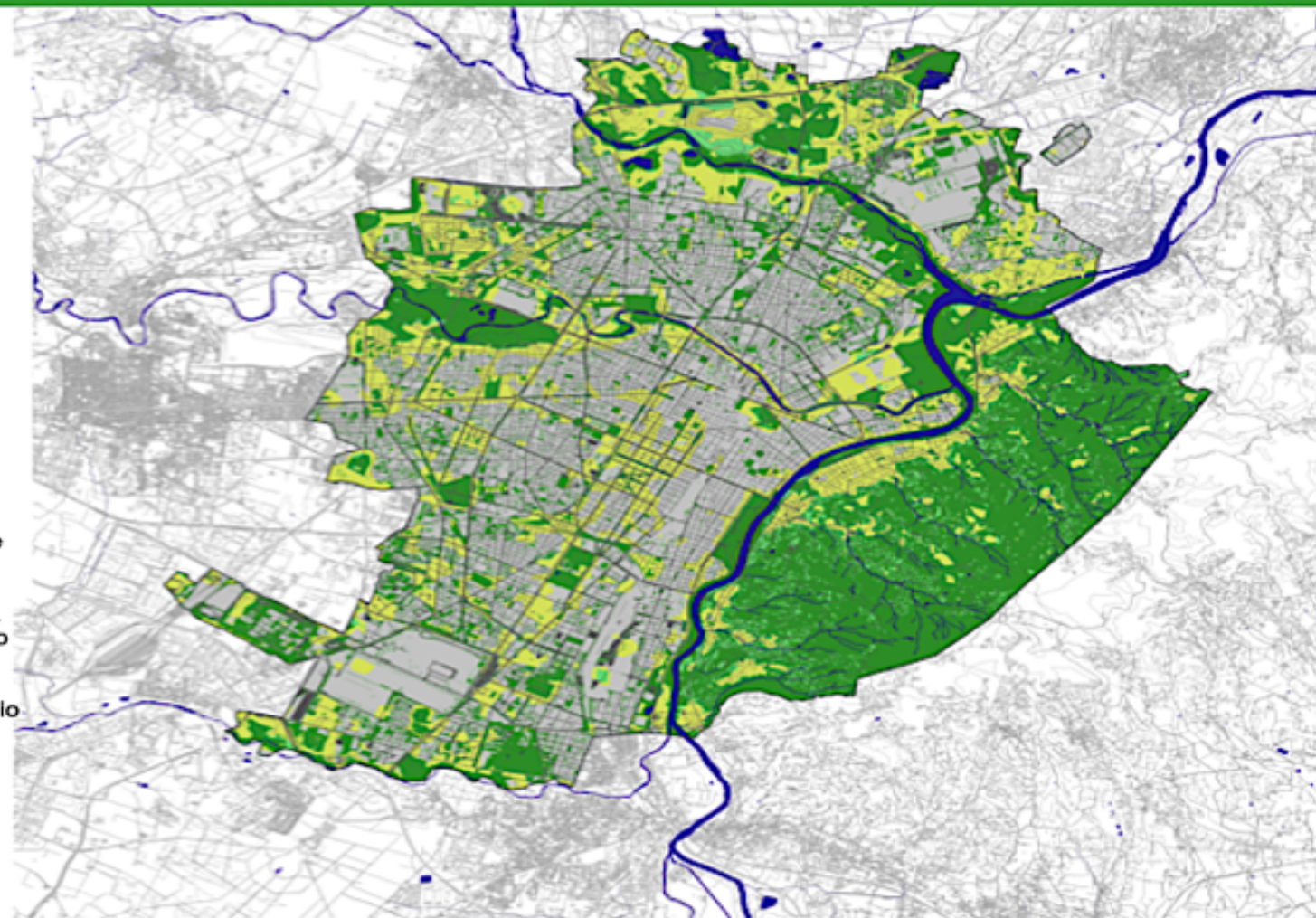
### Rischio Urban Heat Island

- Rischio nullo
- Rischio basso

Il rischio di esposizione a fenomeni di isole di calore può variare in base alle caratteristiche della zona, in particolare alla morfologia urbana, all'altitudine e alla prossimità ad aree più irradiate dai raggi solari

E' inoltre evidente come spesso la prossimità all'infrastruttura verde possa mitigare il rischio di esposizione

Il 54% del territorio comunale è a basso rischio di esposizione





## 66 senior over 65 e rischio UHI medio-alto



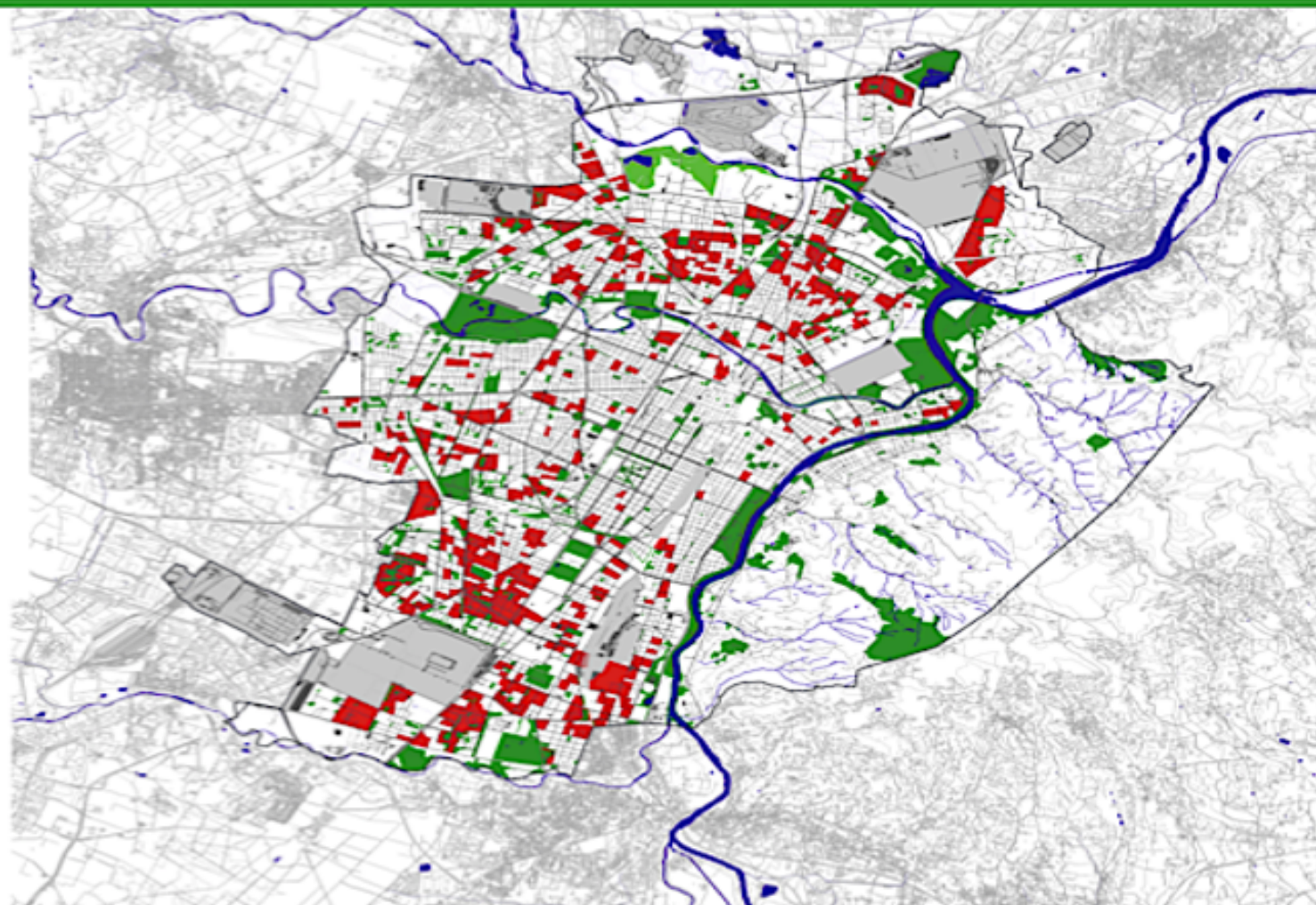
Torino  
Greenprint

### Legenda

- Viabilità
- Aree verdi ricreative
- Area Basse di Stura
- Aree cimiteriali, infrastrutturali e produttive industriali
- Fiumi, laghi e corsi d'acqua

### Rischio Urban Heat Island

- Aree con più di 100 residenti di età over 65 anni esposti a rischio isola di calore medio-alto



## Markus Berchtold

We need...

- ... a new definition of resilience – a bottom up definition
- ...building new, transdisciplinary networks according to the new needs
- ...social and technical innovation and broad, excellent performance
- ...focus, discipline and high speed implementation

Resilience means...

- ...that my personal situation offers me a certain amount of security.
- ...that I trust the political control and that I feel sheltered.
- ...that I live in a community where people look to each other.
- ...that my concerns and ideas are heard and understood.
- ...that I can be effective and from this I gain self-confidence and confidence to face crises.

# Integrated action

## Our proposals for integrated actions

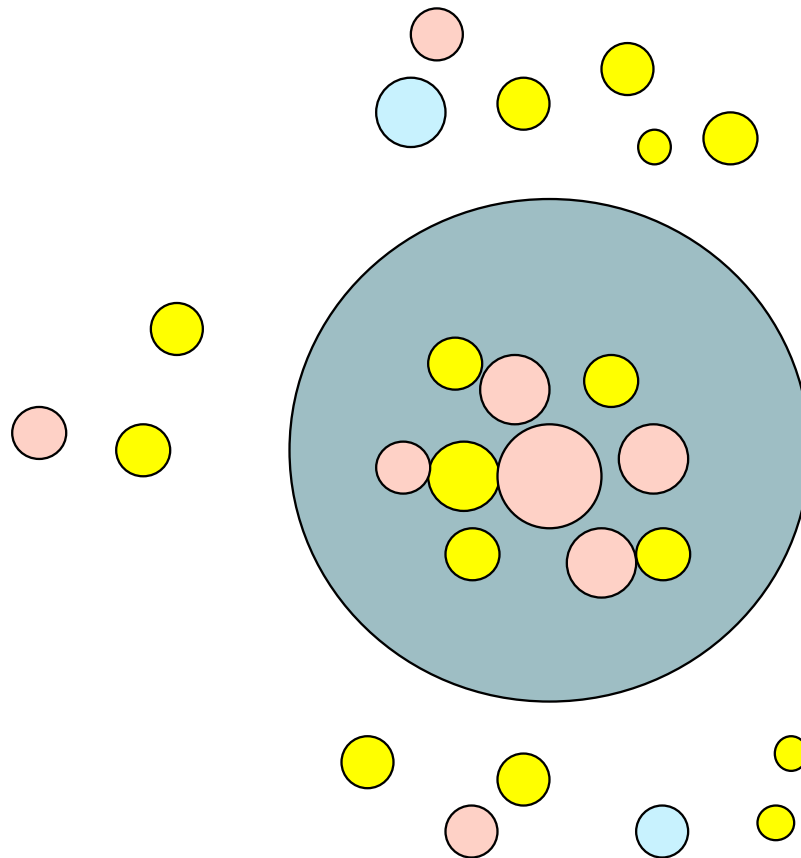
A logical action plan to respect the needs of **both post-pandemic recovery and climate action** will include the following measures:

1. Designate post-pandemic re-development authorities at national and local levels to establish or modify relevant regulations and to provide loans and grants for redevelopment.
2. Obtain major funding commitments from international financial institutions, including World Bank and IMF, and identify major private sources of capital.



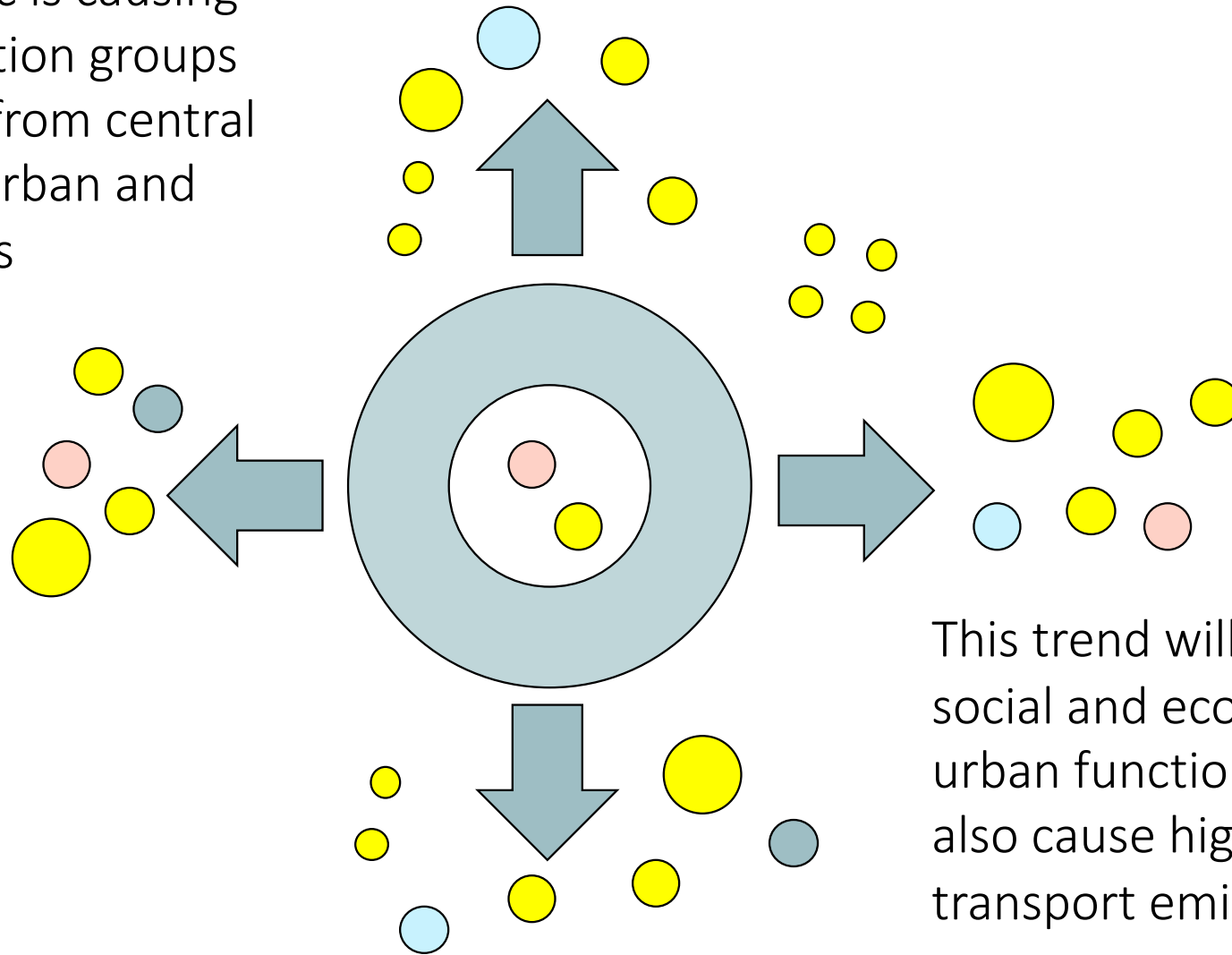
## Our proposals for integrated actions

3. Integrate climate and post-pandemic actions so that post-pandemic social and economic goals and 2050 zero GHG targets can be met.
4. To take into account the current trend for some population groups to move out to peripheral areas, develop urban planning strategies that include development of high-density mixed-use urban nodes around the urban core connected by public transit.

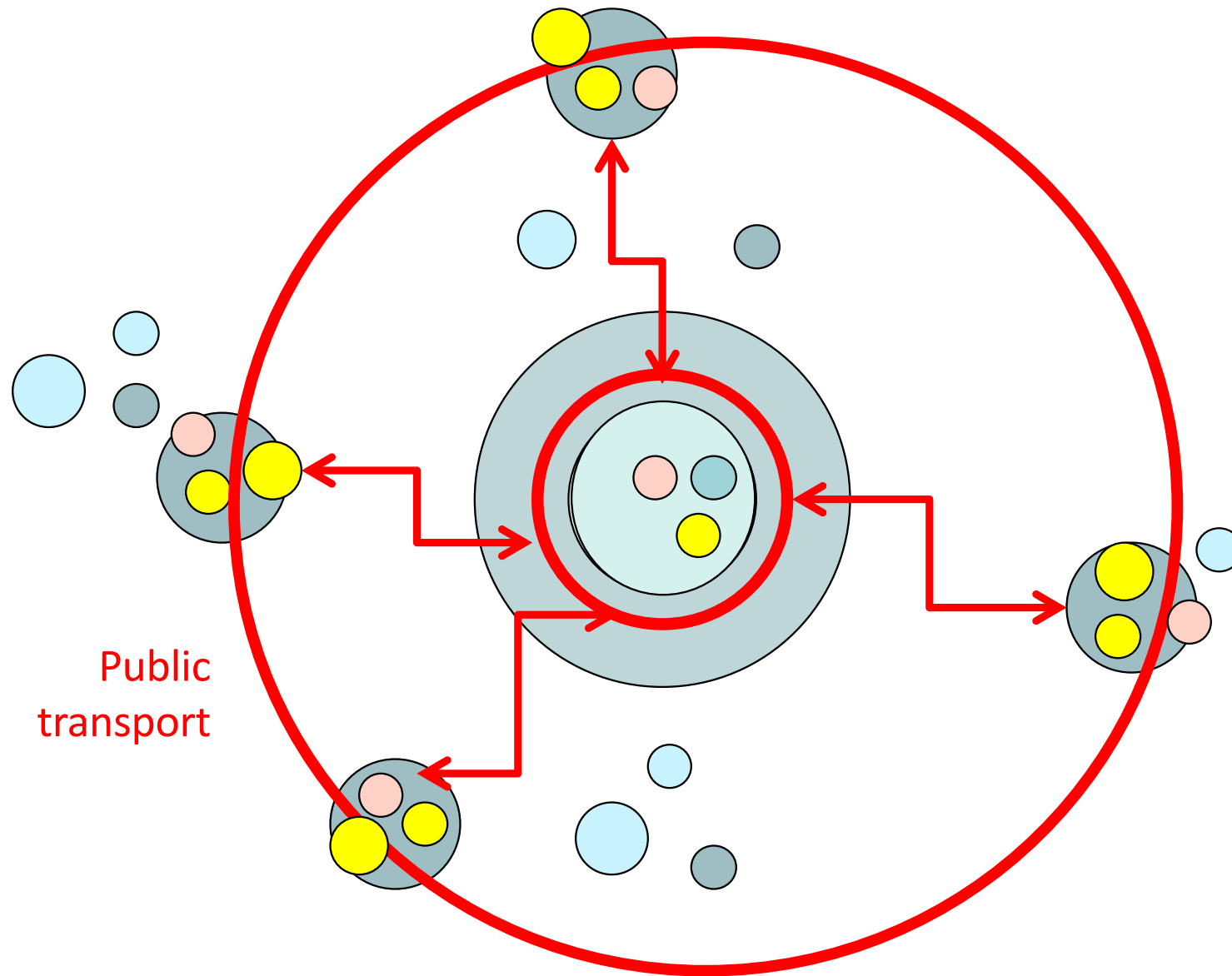


Existing patterns of high densities and mixed uses in urban centres are facing new pressures

The pandemic is causing some population groups to move out from central areas to suburban and exurban areas



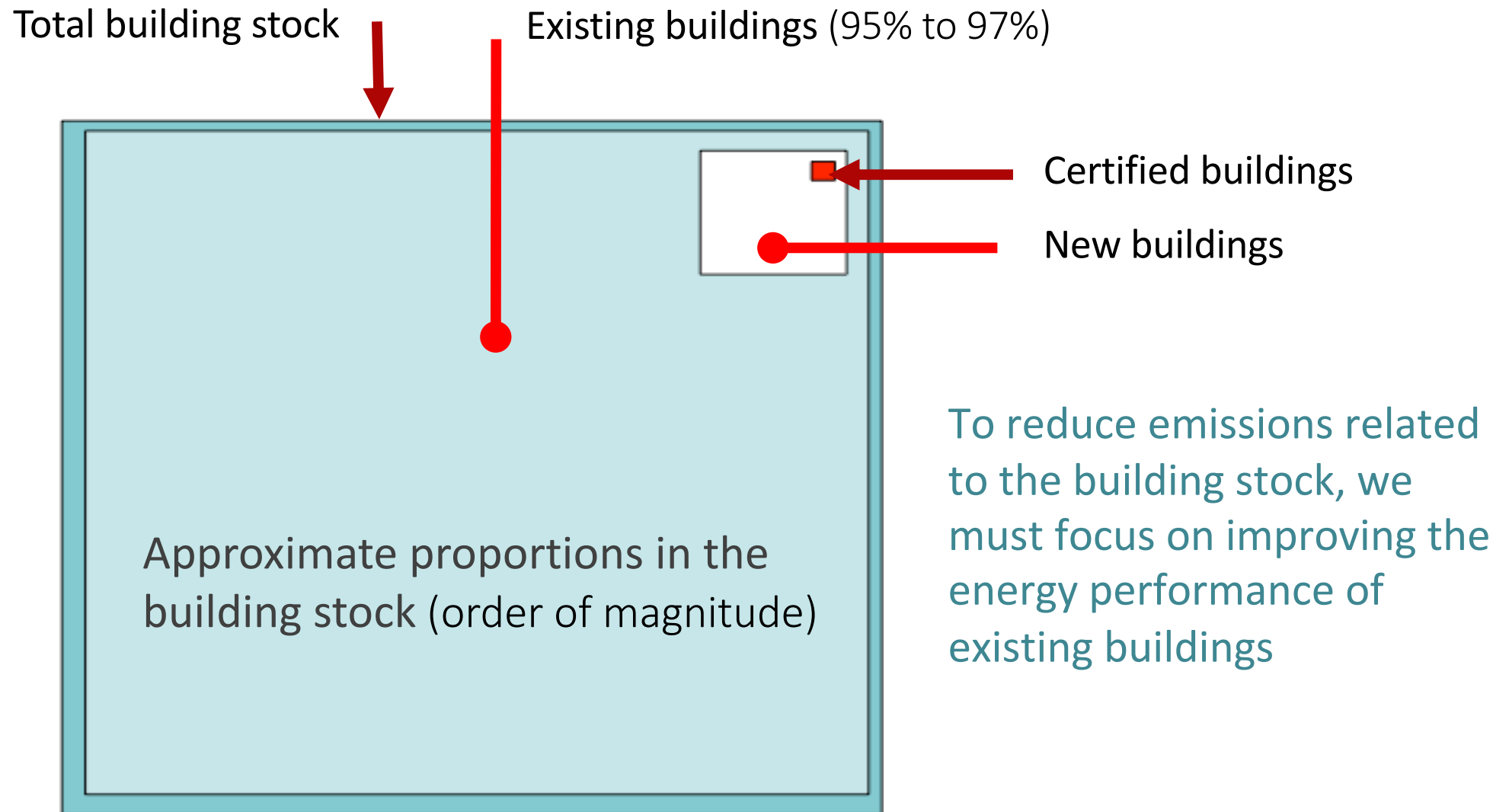
This trend will cripple social and economic urban functions and will also cause higher transport emissions



We would serve climate as well as pandemic needs if we aim for high-density mixed-use nodes connected by public transport: an old but good idea.

## Our proposals for integrated actions

5. Launch housing programs for low-income populations as a major element of post-pandemic social equity and economic recovery measures.
6. For the above work, make use of buildings or parts of buildings that are now surplus to requirements.
7. Establish very demanding targets for energy efficiency and nearly-zero GHG emission buildings and urban public transport systems.
8. Reduce VAT levels for expenditures related to high-performance renovation work, to shift construction activity towards renovation.



## Our proposals for integrated actions

9. Place heavy emphasis on renovation with high performance targets for infrastructure, residential, public and commercial retail buildings.
10. Encourage natural and hybrid ventilation, improve mechanical ventilation capacities, and increase outdoor air ratios in ventilation systems.
11. Establish training programs to support the above initiatives.

## Conclusions

- An effort to simultaneously deal with climate action issues and post-Covid needs appears to be feasible.
- Such efforts will offer great opportunities to integrate post-pandemic goals with those of climate action.



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