



# **CITIES AS CLIMATE RESILIENCE CHAMPIONS**

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Neuni Farhad  
03 July 2019

# C40 organizes the top cities focused on the toughest climate targets in the world



94  
Cities

700+  
Million Citizens



1/4 of global economy

## The C40 Deadline 2020 Program

Aims to support every city, by 2020, to...



### **MITIGATE...**

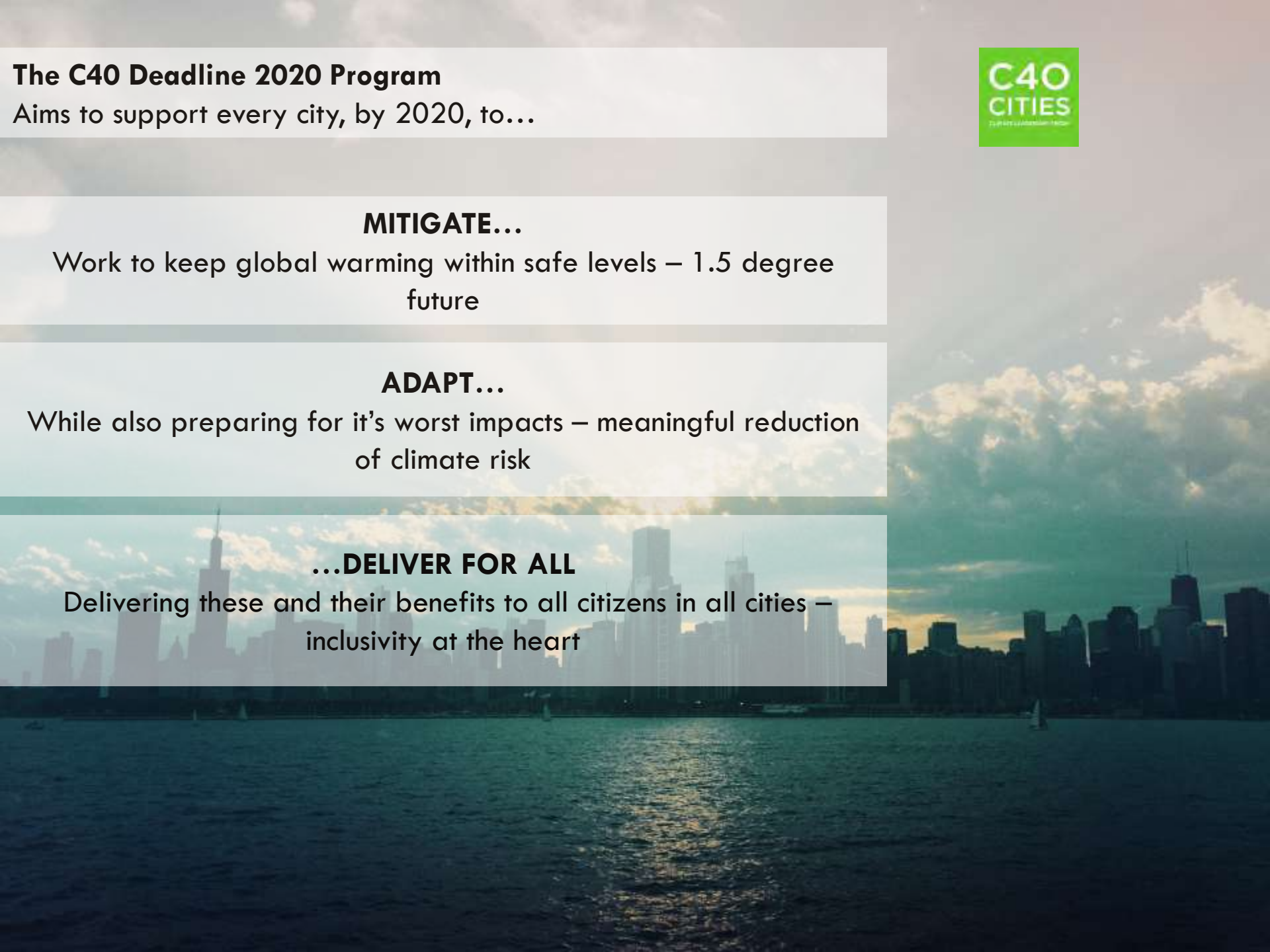
Work to keep global warming within safe levels – 1.5 degree future

### **ADAPT...**

While also preparing for it's worst impacts – meaningful reduction of climate risk

### **...DELIVER FOR ALL**

Delivering these and their benefits to all citizens in all cities – inclusivity at the heart



## By Cities for Cities - A Global City Engagement Model



**Content-Focused  
Initiatives & Networks**



**Direct Support to  
Regions & Cities**



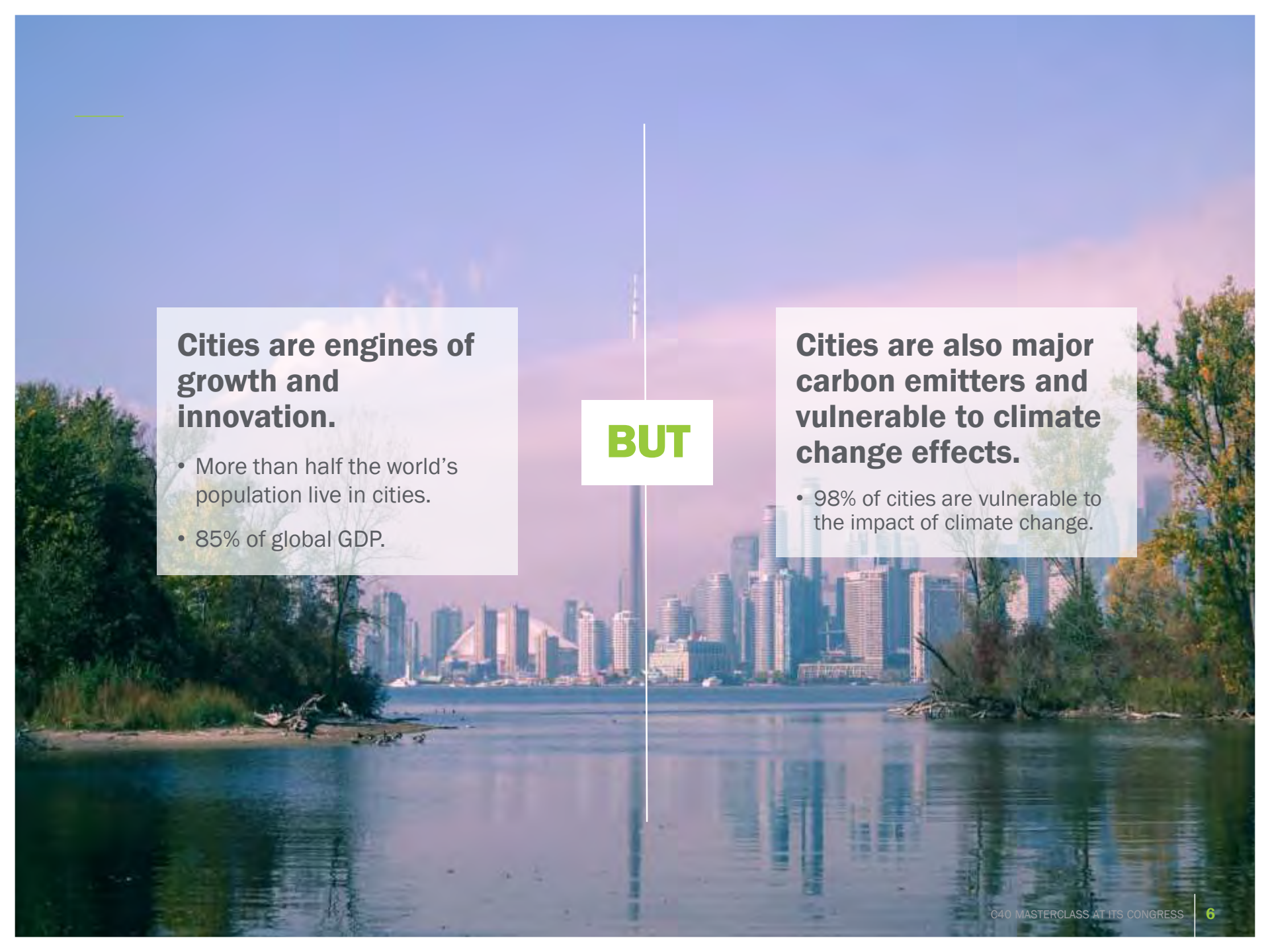
**Research,  
Communications, &  
City Diplomacy**



## WHY CITIES?

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## **Cities are engines of growth and innovation.**

- More than half the world's population live in cities.
- 85% of global GDP.

**BUT**

## **Cities are also major carbon emitters and vulnerable to climate change effects.**

- 98% of cities are vulnerable to the impact of climate change.

# **CITIES CAN MAKE THE DIFFERENCE**

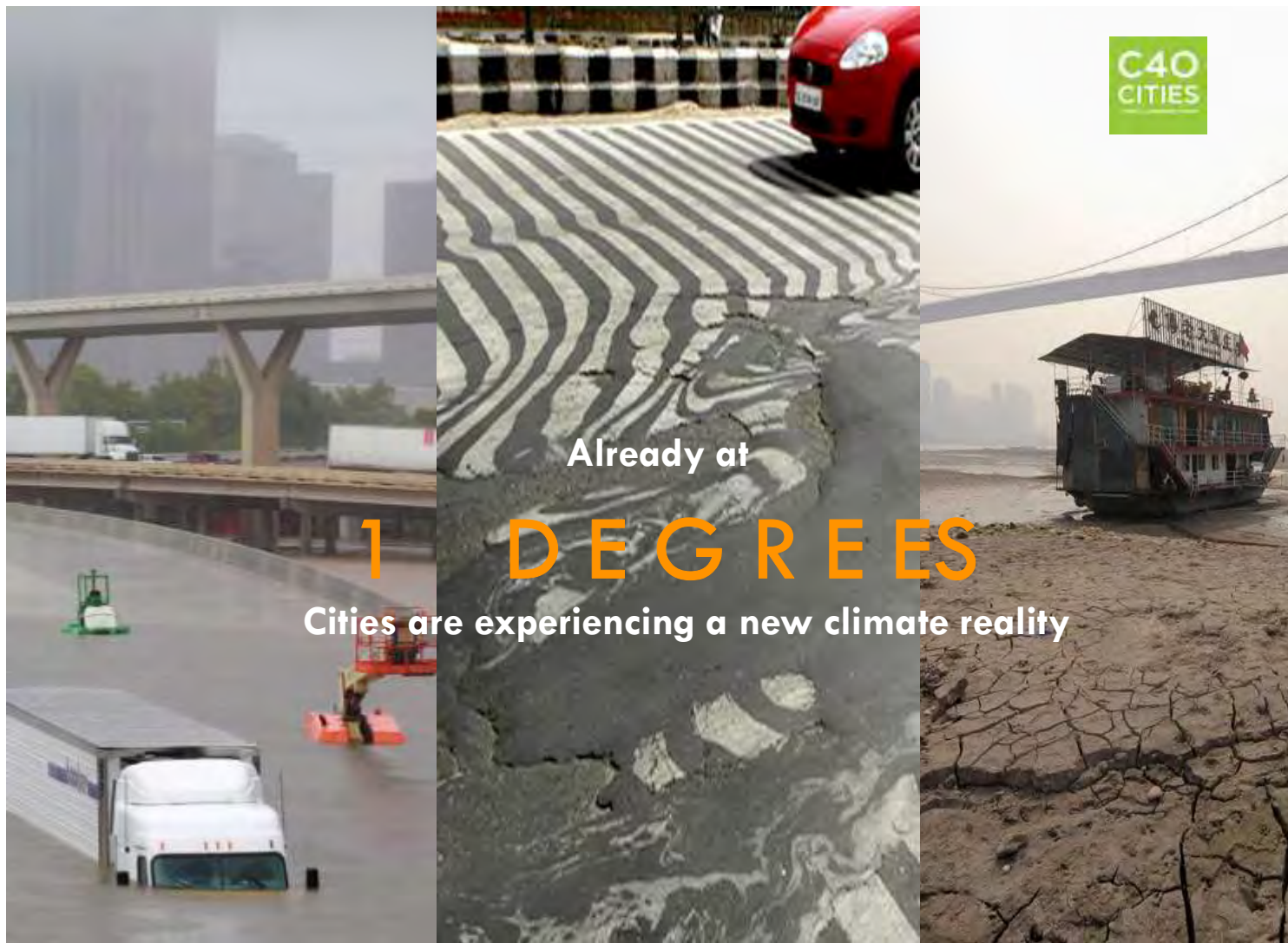
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Under 500 cities will be  
responsible for 60% of  
global economic growth



**70% of C40 cities report that they are already experiencing the effects of climate change**





# The impacts of climate change

**MUMBAI MONSOON**



**CAPE TOWN DROUGHT**

**DAY ZERO**  
IS WHEN THE WATER RUNS OUT

**CALIFORNIA FIRES**



**HOUSTON FLOODS**





# The Future We Don't Want: Cities & heat extremes



By the 2050s

**1.6 BILLION** people could face average summer temperature highs of 35°C (95°F).

- ➔ 1.4 billion more people than today.
- ➔ 970 cities could be affected; 620 more than today.
- ➔ Cairo, Egypt, today has average summer highs of 34°C (93°F).

**70,000** deaths



The 2003 heatwave that hit Europe caused an estimated 70,000 deaths.

High temperatures pose a severe risk to human health. The elderly, young children and people with medical conditions are most at risk.



In the US, heatwaves kill more than 600 people per year on average, more than all other climate hazards.

**#1** cause of death

Heat affects workforce productivity. By 2030 annual global heat-related productivity losses could cost \$2 trillion.

**\$2 trillion**

Cities can adapt by:

- ➔ Improving green, blue and cool infrastructure like parks, lakes and cool roofs.
- ➔ Providing shade spots and access to cool buildings.

- ➔ Preparing Heat Action Plans.
- ➔ Developing early warning systems.



GLOBAL COVENANT  
OF MAYORS FOR  
CLIMATE & ENERGY



URBAN CLIMATE CHANGE  
RESEARCH NETWORK



ACCLIMATE

# The Future We Don't Want: Cities & energy



By the 2050s

**230 CITIES** have nearby power plants that may be vulnerable to half a metre of sea level rise.

- ➔ More than 1,400 power plants may be at risk.
- ➔ Over 450 million people live in these cities.
- ➔ Climate impacts will also affect distribution systems.

**180,000** MW

These power plants provide 180,000 megawatts of electrical capacity.

Cities are power hungry, consuming around three quarters of total primary energy supply.



**90%** enough to power 90% of US homes.

**\$70 billion**

Climate impacts to energy systems are costly for cities.

Weather disruptions to the U.S. power sector today cost up to \$70 billion per year.

Cities can adapt by:

- ➔ Increasing energy system resilience.
- ➔ Improving energy efficiency.
- ➔ Investing in low-carbon energy.
- ➔ Developing utility adaptation plans.



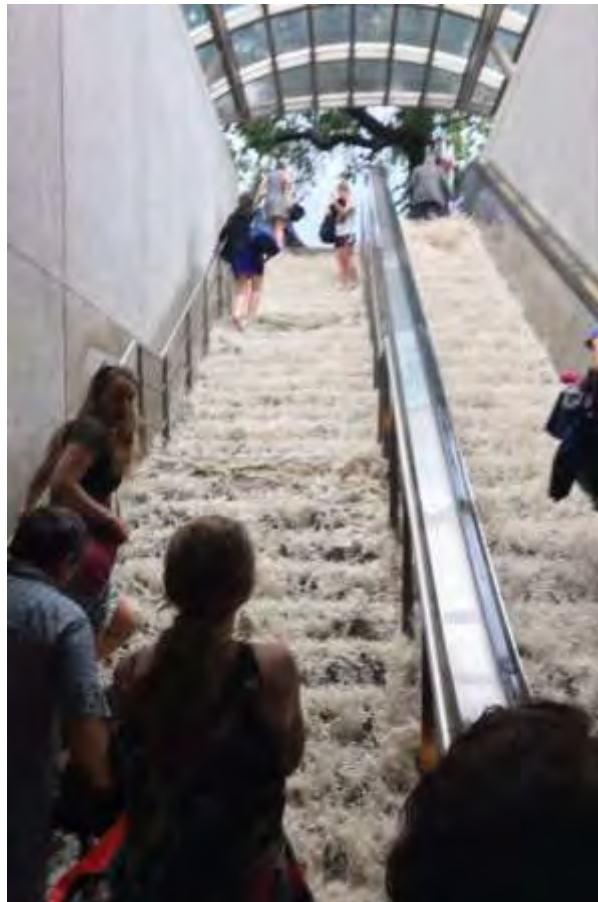
GLOBAL COVENANT  
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URBAN CLIMATE CHANGE  
RESEARCH NETWORK



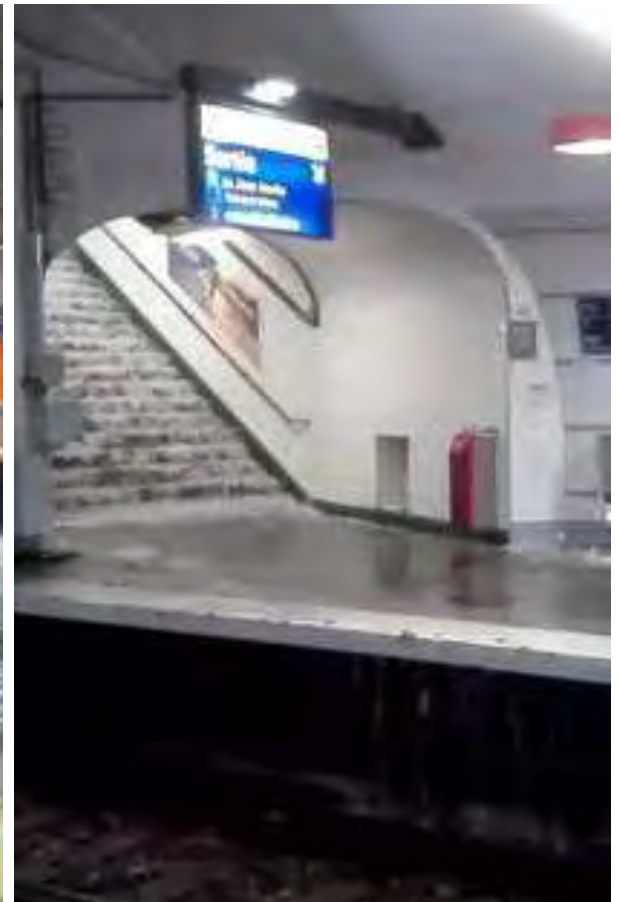
ACCLIMATE



Washington D.C. 2016



Madrid 2017



Paris 2017



## **WHAT ARE THE SOLUTIONS IN CITIES?**

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# Singapore

## Bishan-Ang Mo Kio Park

### CLIMATE CHALLENGES

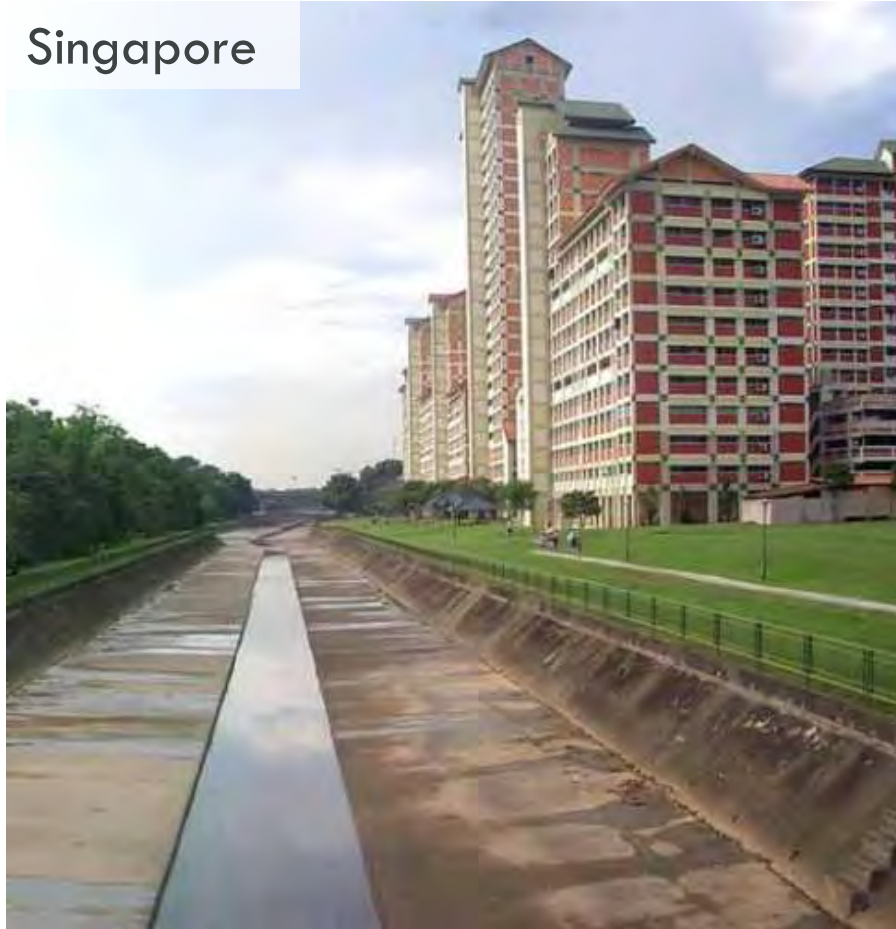
Hydrological—heavy rainfall increases flooding risk in the city

### SOLUTION

Bioengineered river channel to prevent flooding and create natural space



Singapore





# Copenhagen Cloudburst Management

## CLIMATE CHALLENGES

Relatively infrequent cloudburst events caused by heavy rainfall and flooding from the sea do a lot of damage very quickly

## SOLUTION

"Combined solution" of traditional sewage and green/ blue infrastructure surface solutions that retain and redistribute the water from a 100-year flood






# Cloudburst Streets in action







# New York: Building Guidelines for Flooding

## ➔ CLIMATE CHALLENGES

New York City at risk for flooding especially in extreme weather events (Hurricane Sandy)

## ➔ SOLUTION

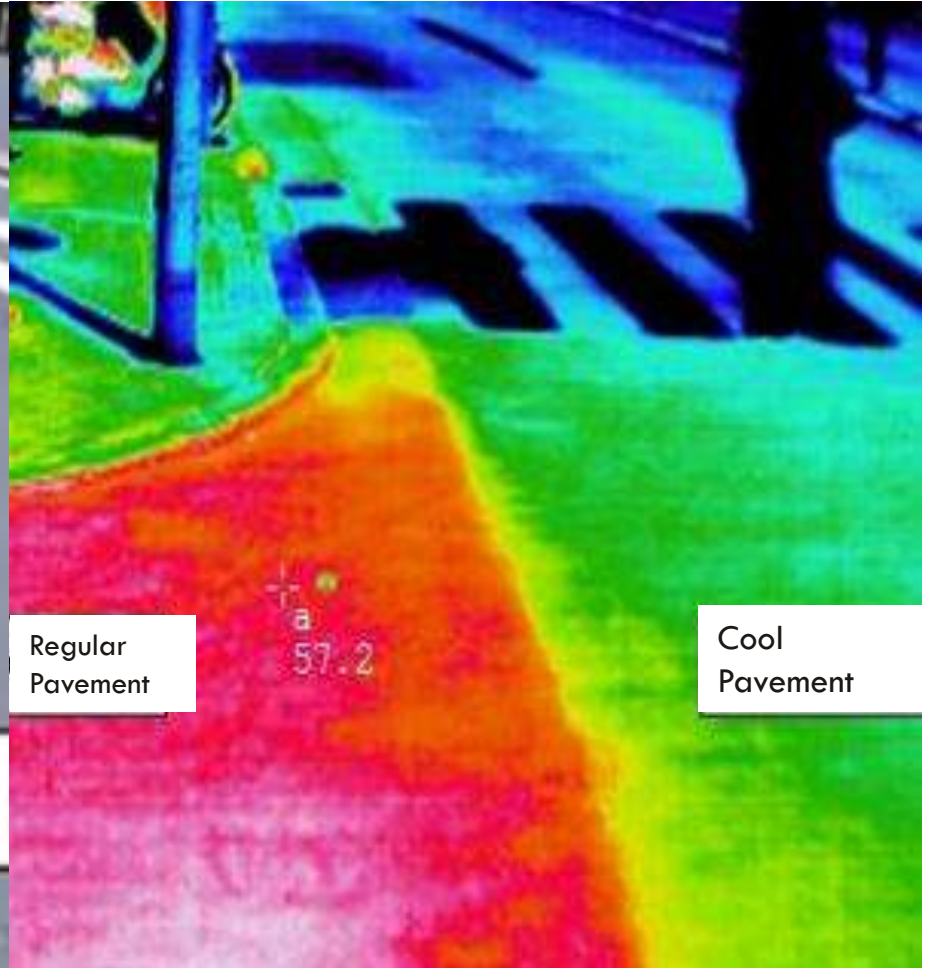
Develop building guidelines to address the increasing flood risks of the city and make New York City more resilient



Tokyo



Regular  
Pavement



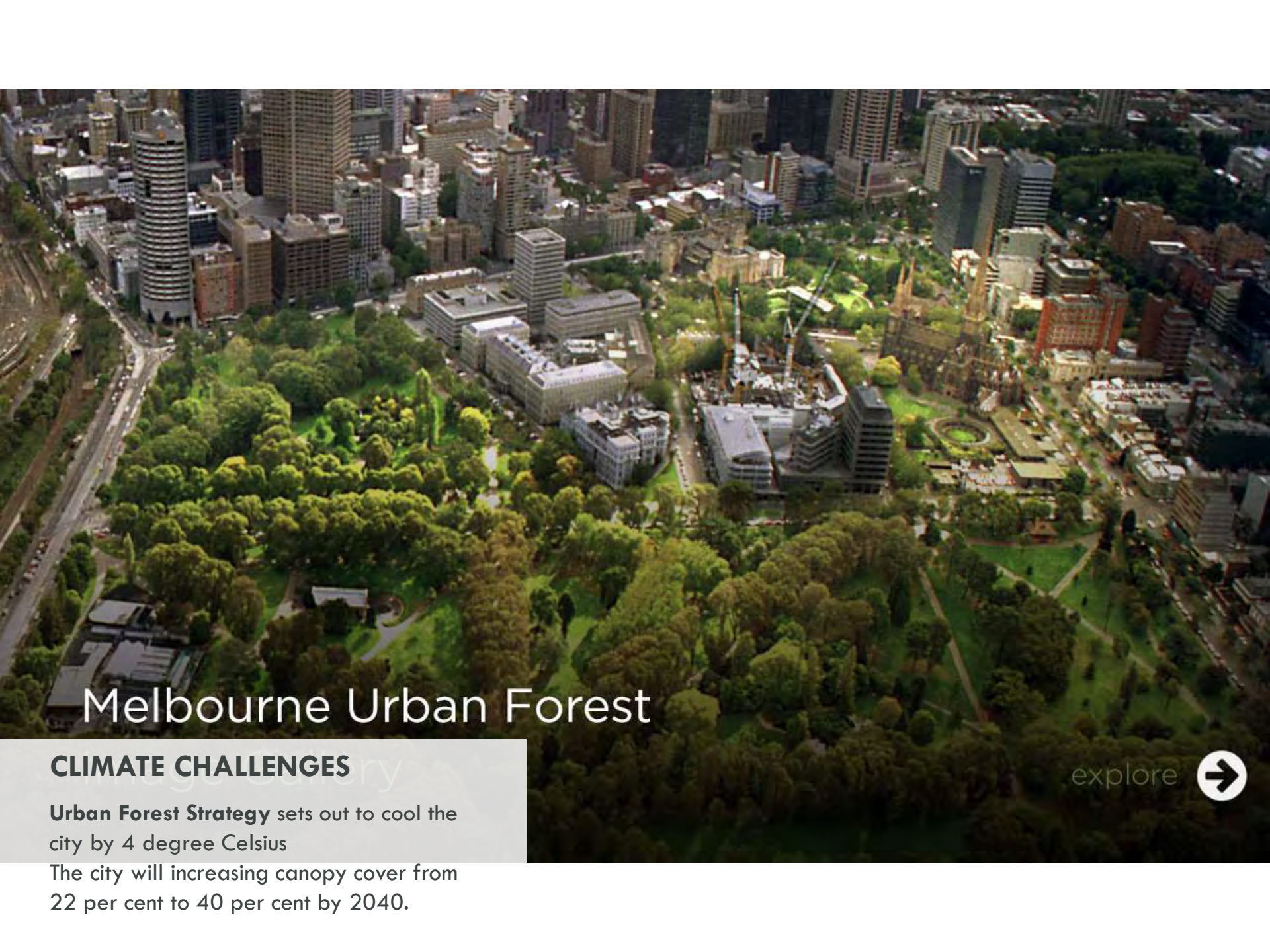
Regular  
Pavement

Cool  
Pavement

Los Angeles







# Melbourne Urban Forest

## CLIMATE CHALLENGES

**Urban Forest Strategy** sets out to cool the city by 4 degree Celsius

The city will increasing canopy cover from 22 per cent to 40 per cent by 2040.

explore 



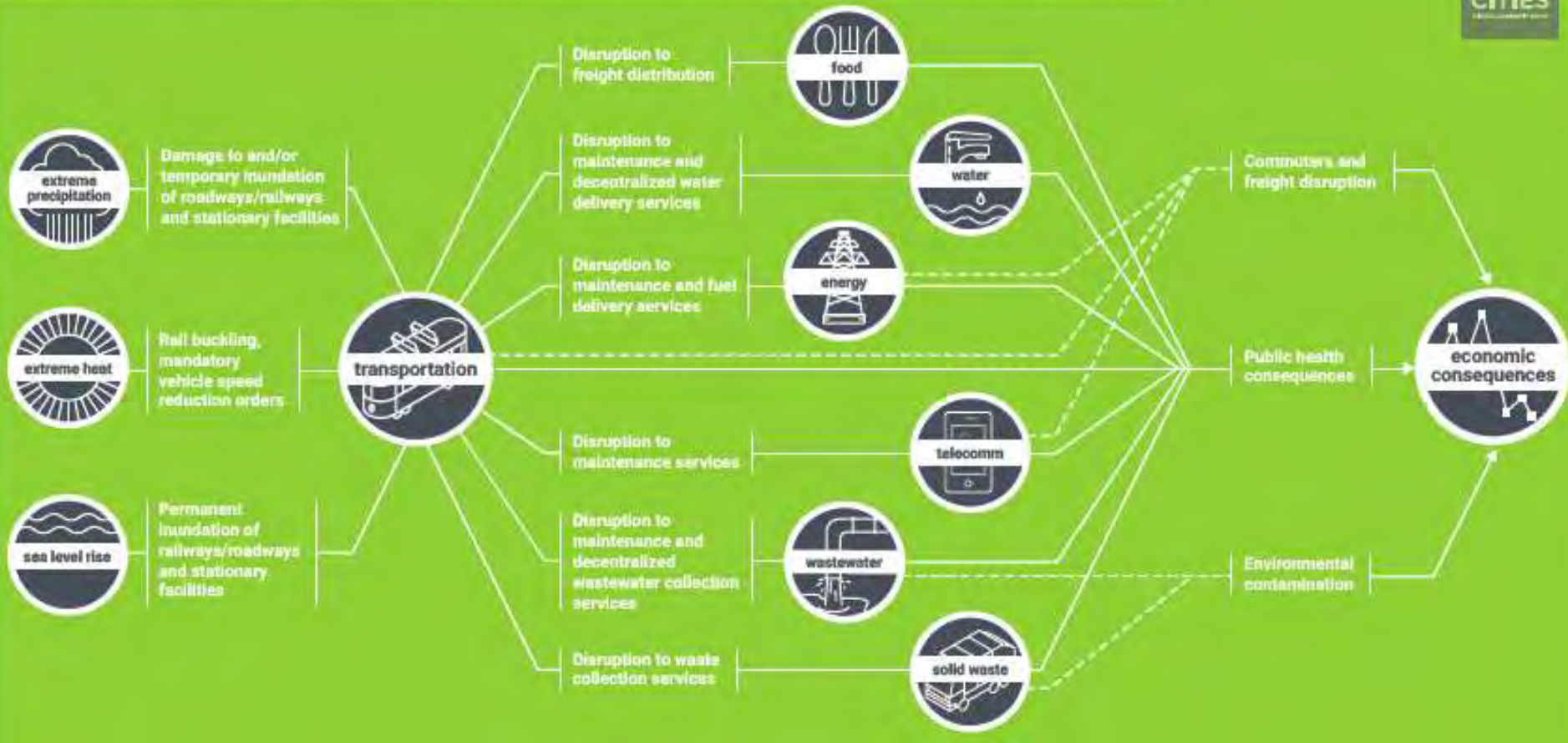
## **WHAT DOES A SUCCESSFUL CITY LOOK LIKE?**

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# INFRASTRUCTURE INTERDEPENDENCIES

Example of a sector that impacts multiple sectors: **Transportation**





# Adaptation and Mitigation Interaction Assessment Tool

A tool that assesses the interactions between adaptation and mitigation actions



Synergies



Trade-offs



Mal-investment



Piggybacking



# Measuring Progress in Urban Climate Adaptation



**MEASURING PROGRESS IN URBAN  
CLIMATE CHANGE ADAPTATION**

Monitoring - Evaluating - Reporting Framework  
January 2019

RAMBOLL  
FONEN

## Monitoring Evaluating and Reporting Framework



### Guidance Document

- A step-by-step guidance on constructing the MER framework and intervention logics for adaptation actions in cities



### Indicator Matrix

- A list of intervention logics for the most commonly implemented adaptation actions in cities
- List of indicators for cities to use
- A methodology behind outcome indicators



### Indicator Manual

- A short guidance to navigate the indicator matrix
- Explanations of key principles behind indicators



## C40 ADAPTATION

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# **MEANINGFUL REDUCTION OF CLIMATE RISK IN ALL CITIES**

**All C40 Cities will have  
a measurable Climate  
Action Plan**

**C40 Mayors to have  
skills/knowledge  
required for effective  
adaptation**

**C40 cities will have the  
access to finance and  
resources to respond to  
CC impacts**

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## C40's Adaptation Programme





# Thank you

## CONTACT

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# 1. Adaptation Masterclass – Leadership Symposium

(Technical Assistance)

2. Risk Assessment
3. Strategy Development
4. Implementation
5. Monitoring and Evaluation



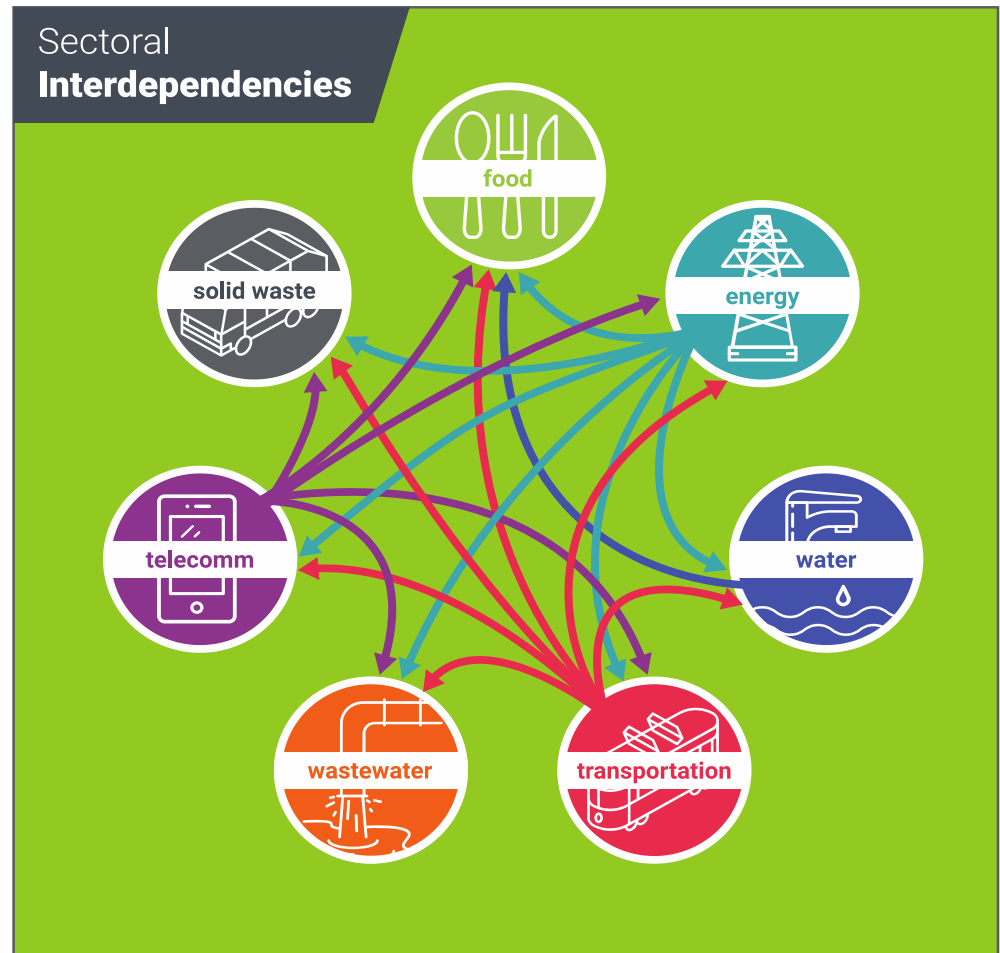


- Risk Assessment Network
- Cool Cities
- Connecting Delta Cities





- Impact 2020
- Synergising Mitigation and Adaptation
- Monitoring and Evaluation
- Interdependencies
- Adaptation and equity







- Embedding Adaptation across C40 Networks
  - Transport
  - Land-use planning
- Deadline 2020 – Measurement and Planning





**RE** Eco-corridors in streets



**RE** Synergic elements



**UV** Revitalized corridors (recreation)











# ROTTERDAM, THE NETHERLANDS:



## CLIMATE CHALLENGES

Hydrological—delta city surrounded by water on 4 sides. Increasing extreme rain events put pressure on sewage system and lead to flooding.



## SOLUTION

Water-retaining public squares



## STATUS OF THE PROJECT

Completed in 2011



## LEAD DEPARTMENT

Rotterdam Climate Initiative, City of Rotterdam



