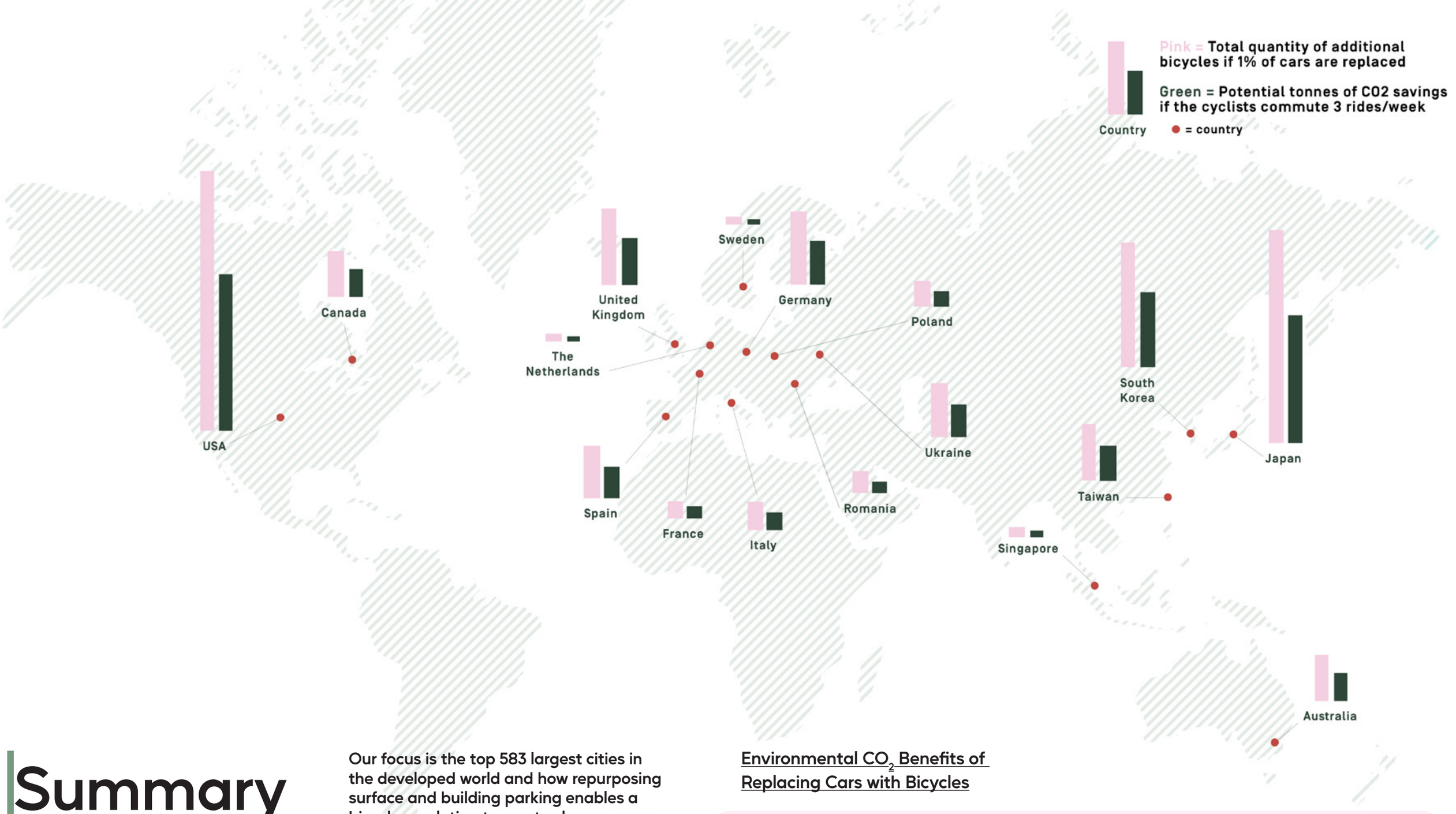
The Vital Role of The Bicycle in Creating Cleaner, More Liveable Smart Cities

March 2023



Summary

Our focus is the top 583 largest cities in the developed world and how repurposing surface and building parking enables a bicycle revolution to create cleaner more liveable smart cities.

Just a 1% change in travel activity from car to bicycle creates huge positive effects for cities and their residents.

Environmental CO_2 Benefits of Replacing Cars with Bicycles

	Cars to Bicycle Replacement (1%)	CO_2 Savings (mil tonnes) 1 ride commute/week	CO_2 Savings (mil tonnes) 3 ride commutes/week
Europe	370,000	66.8	200.3
North America	260,000	52.4	157.2
Asia Pacific	389,000	78.4	235.2
Total	1.019 million bicycles	197.6 million tonnes	592.7 million tonnes

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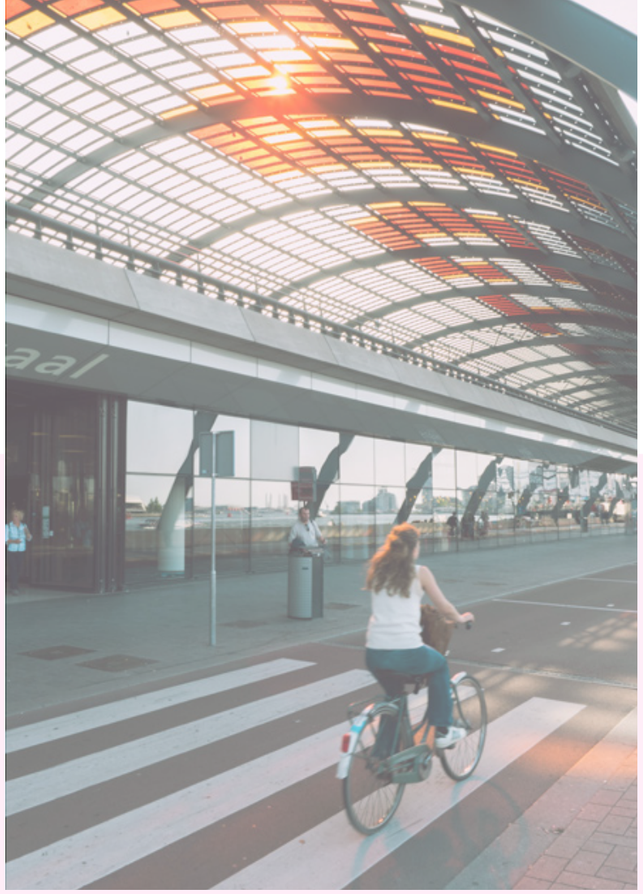


"We are using technology to make our cities smarter, and cycling can be a key part of this. We are exploring ways to use data to improve the cycling experience, such as by providing real-time information on bike availability and parking."

Dr. Vivian Balakrishnan - Minister for Foreign Affairs and Minister-in-charge of the Smart Nation Initiative, Singapore

Cities face increasing competition for attracting and retaining residents and businesses. With advances in technology and transportation making it easier for people to live and work anywhere, cities will have to offer compelling reasons for people to choose them over others. To win, cities will need to offer a high quality of life, a strong economy, and a diverse array of cultural and recreational opportunities. They will also have to focus on sustainability and environmental stewardship, as well as addressing issues such as affordability, safety, and traffic congestion. Ultimately, the cities that can successfully create attractive, liveable environments will be the ones that succeed in attracting and retaining residents.

The vision of a smart city is one where people, businesses, and the environment thrive together in harmony. This requires a multi-faceted approach that addresses a wide range of issues, from air quality to transportation to the built environment. Improving air quality is one of the critical steps towards this goal. By reducing the number of cars on the road and in so doing reducing CO_2 and $PM_{2.5}$ emissions and promoting active transportation options such as bicycles and mass transit, cities can create healthier and cleaner environments for their residents. The more welcome future cities are to bicycles, the greener and healthier the city becomes. The healthier the city means higher air quality...

Our focus in this report, is not only the distance travelled but the end bicycle storage destination. During the past few decades, we have seen a continued increase in car parking spaces in the city, which in turn has led to an increase in demand for cars. As cities become more populated, so cities became more congested with single vehicles. It is our belief that the bicycle and active travel is a vital aspect of tomorrow's smart cities reversing this trend. The bicycle will help reduce the number of cars on the road, free up parking spaces for other uses, create a better social fabric, healthier population, produce positive economic and social benefits, and so forth. It's good news that cities are spending more on infrastructure with bike lanes, increased sidewalks, etc.

This is why we are focusing on both the distance travelled but the final destination. It's important that we have the proper infrastructure for bicycles to park within the city buildings and transportation nodes outside mass transport access points. As noted by the European Parliament resolution of 16 February 2023 on developing an EU cycling strategy there are many other benefits for a wider adoption of the bicycle and a bicycle culture. Some of these include the creation of green jobs within the bicycling industry, promotion of cycle-friendly workplaces, increasing accessibility and social affordability.

The bicycle and its IMPACT

The increased use of bicycles as an active transportation choice over cars, produces three amazing environmental impacts. Bicycles reduces our need for energy, reduces greenhouse gas emissions, and reduces the emissions of transports. In this light, the bicycle and the smart city are aligned to achieve similar SDG goals.

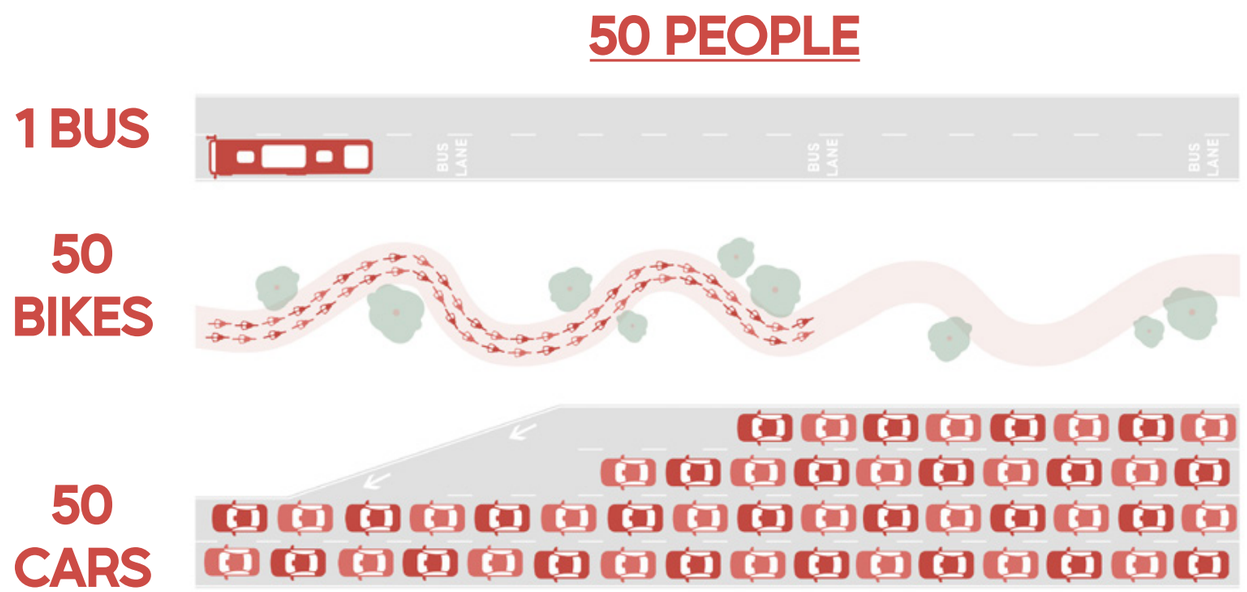
GOAL (Aligned with the UN Sustainability Development Goals)	BICYCLES...	SMART CITIES...
3 GOOD HEALTH AND WELL-BEING	promote physical activity, reduce air pollution, and decrease traffic congestion.	monitor and track air quality levels.
7 AFFORDABLE AND CLEAN ENERGY	offer low-carbon mode of transportation that do not rely on fossil fuels.	promote sustainable transportation. Support clean energy.
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	expand growing bicycle industry that supports innovation and job creation.	implement green infrastructure.
11 SUSTAINABLE CITIES AND COMMUNITIES	promote sustainable urban mobility by reducing traffic congestion, improving air quality, & providing affordable & accessible transportation.	encourage energy-efficient buildings, offer mass transportation, focus on urban mobility.
13 CLIMATE ACTION	help reduce greenhouse gas emissions.	reduce greenhouse gas emissions.

The URBANIZATION of the world

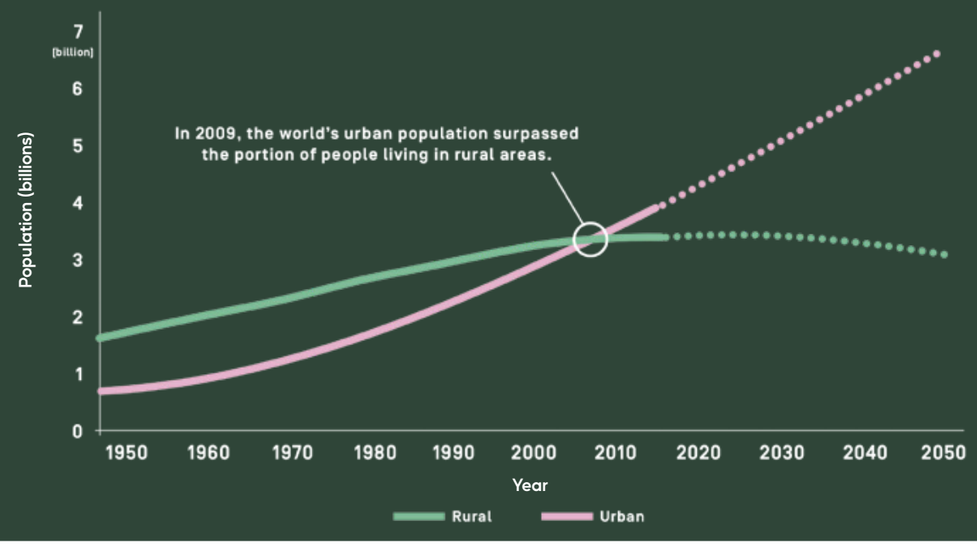
We have been leaving the farms and going to cities for many many decades. This trend is projected to continue as humans prefer the comforts of city life with all its amenities.

There have been many studies that project the growth of cities to 2050 by evaluating population growth, economic growth, and urbanization patterns. One common trend among these studies is the prediction of rapid urbanization in the developing world, particularly in regions such as Africa and Asia. According to United Nations estimates, by 2050, two-thirds of the world's population is expected to live in urban areas, with most of this growth occurring in developing countries.

"...by 2050, two-thirds of the world's population is expected to live in urban areas..."



Estimated and projected rural vs urban populations of the world, 1950-2050



Increased urbanization

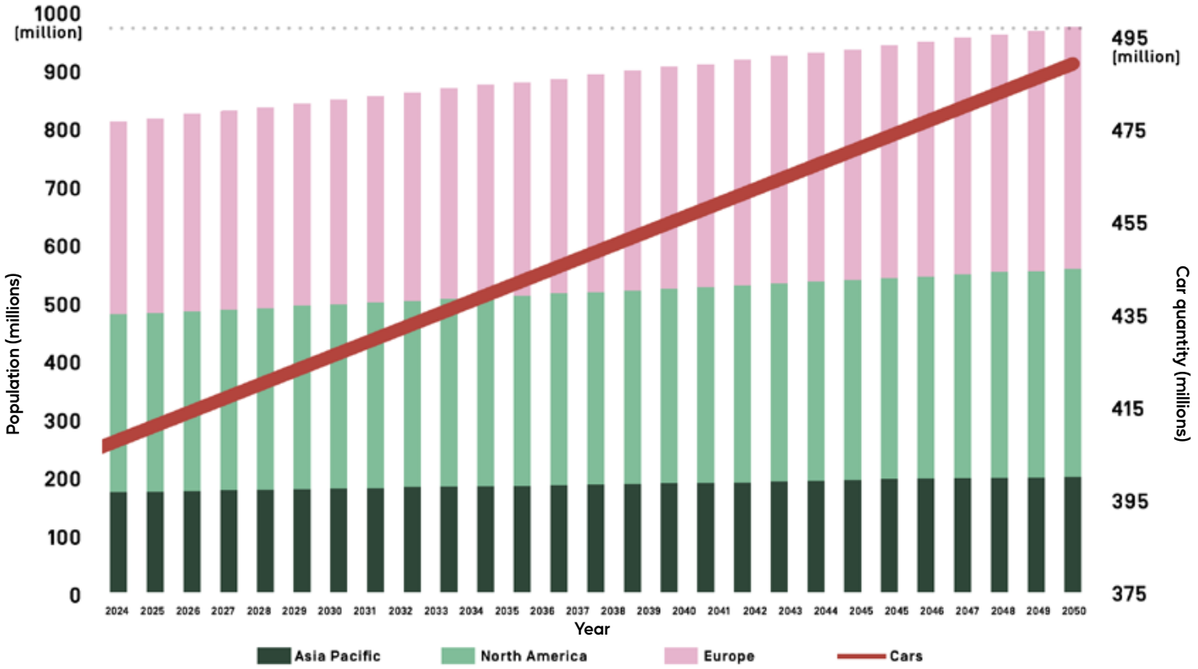
⇩

Denser population with greater congestion & air pollution

⇩

We need to change our transportation habits

Urbanization of developed world and unchecked car growth potential



Currently across developed North America, Asia Pacific, and Europe, more than 817 million people live in core urban centers (cities). This is projected to grow to near 1 billion by 2050. If nothing else changes, this will lead to an increased demand for cars as you can see by the red line in the chart from 408 million cars now to 490 million cars by 2050 for the same urban centers.

As you can see from Table 1: We have more than 580 cities in the developed world with more than 200,000 residents. We are using a conservative estimate to create a total ICE (Internal Combustion Engine) car number. Using a 1% conversion of car ownership to bicycle usage, we get a goal of converting car users to bicyclist to be nearly 1 million potential bicyclists.

Table 1: 2021 population data (top 583 cities)

	Population (millions)	Cars (millions) (estimate)	Cars to Bicycle Replacement (1%)
Europe	132.5	33	370,000
North America	92.8	23	260,000
Asia Pacific	138.9	34	389,000
Total	**364.2 million people**	**90 million cars**	**1.019 million bicycles**

Why we need to repurpose our cities for ACTIVE LIFESTYLES

As urbanization has increased over the years, so has the air quality deteriorated in these cities. As cities have grown so has the number of vehicles on the road – cars and trucks all emit pollutants in the air including nitrogen oxides, particulate matter, and CO_2. As more people move into cities so have the demand for housing and construction increased with a resultant increase in pollutants from heavy machinery, equipment as well as ongoing heating/cooling of buildings. So with more people in the city, population growth has seen increased demand for housing and transportation.

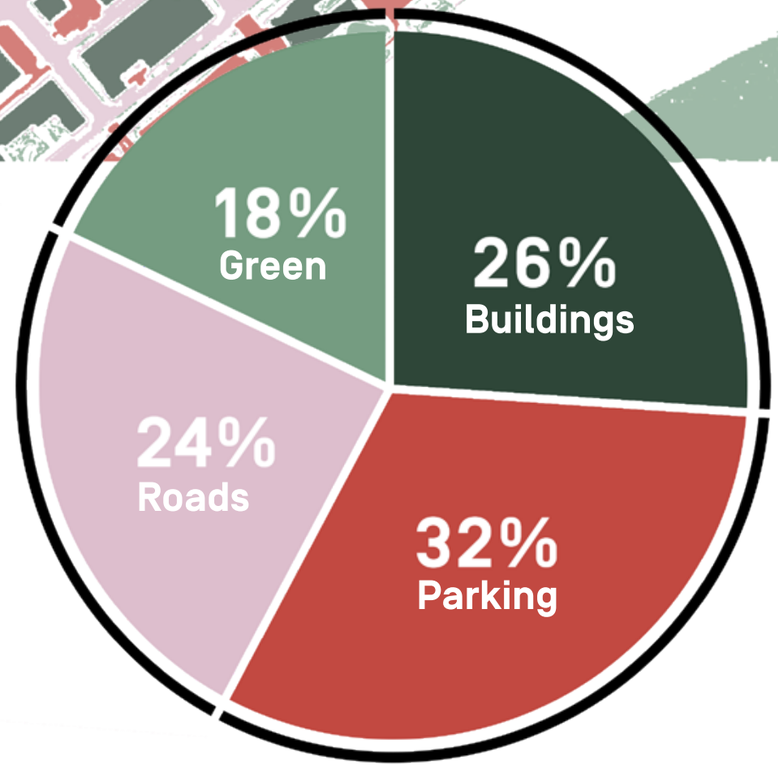
The smart city of the future is solving for how best organize its city to allow for continued population growth while creating a better environment. This leads to a central question facing all cities – how important is air quality to smart city competitiveness?

So, what are the goals of smart cities in the future? There are many interconnected goals as noted earlier. Good air quality seems to be a central objective – it increases liveability and health, it involves less cars, more bicycles, more mass transport, more green space, less car parks, all metrics that we as humans value. CO_2 per capita seems a central key objective to enhance any cities reputation and liveability.

The implications of a rapidly growing urban center/city for sustainability and the environment, is that we must do better with less. If nothing is done then the population move to cities will lead to increased energy consumption, acceleration of greenhouse gas emissions, and pressure on natural resources. Accordingly, this highlights the importance of sustainable urban development, including measures such as energy efficiency, renewable energy, and green infrastructure, in order to ensure the long-term liveability and sustainability of cities.

Most developed world cities have a familiar layout – there are roads, surface car parking, buildings and other amenities (parks, etc.). Reviewing this layout below from a typical US city we see that up to 40-50% of a city may be made for cars. The single most effective way to change green house gas emissions in cities is to cut our dependence on cars and repurposing cities for a more active lifestyle.

Typical land-use distribution in a USA downtown district



Over 50% of the city centre is allocated to parking and road infrastructure.

The bicycle, the carpark, and active travel to the RESCUE

The key objectives of smart cities encompass various areas such as improved transportation, energy efficiency, health and well-being, safety, sustainability, economic development, and citizen engagement. Achieving these objectives can make cities more habitable and less polluted. In this regard, the bicycle serves as a crucial enabler and a tool for transformation.

To comprehensively decarbonize cities, it is imperative to adopt an integrated and holistic approach that recognizes the interdependency of different sustainable solutions. Cycling promotion and car park space substitution are two fundamental components of this approach.

Cycling offers a clean, efficient, and sustainable mode of transportation that can significantly reduce greenhouse gas emissions. Investing in cycling infrastructure such as bike lanes and bike parks can create a safer and more attractive environment for cyclists, encouraging more people to switch from cars to bikes. Furthermore, it is essential to consider the end destination of cycling, such as municipal parking areas, transportation nodes, or bicycle racks, to facilitate a seamless transition to other transportation modes.

Transportation is a major contributor to greenhouse gas emissions in cities, making it essential to adopt sustainable and low-carbon options such as electric vehicles, public transportation, and car-sharing services.

Cities can reduce the need for car use by improving the connectivity and accessibility of public transportation systems and promoting non-motorized transport like walking and cycling. Additionally, providing financial incentives for low-emission vehicle purchases can encourage their adoption.

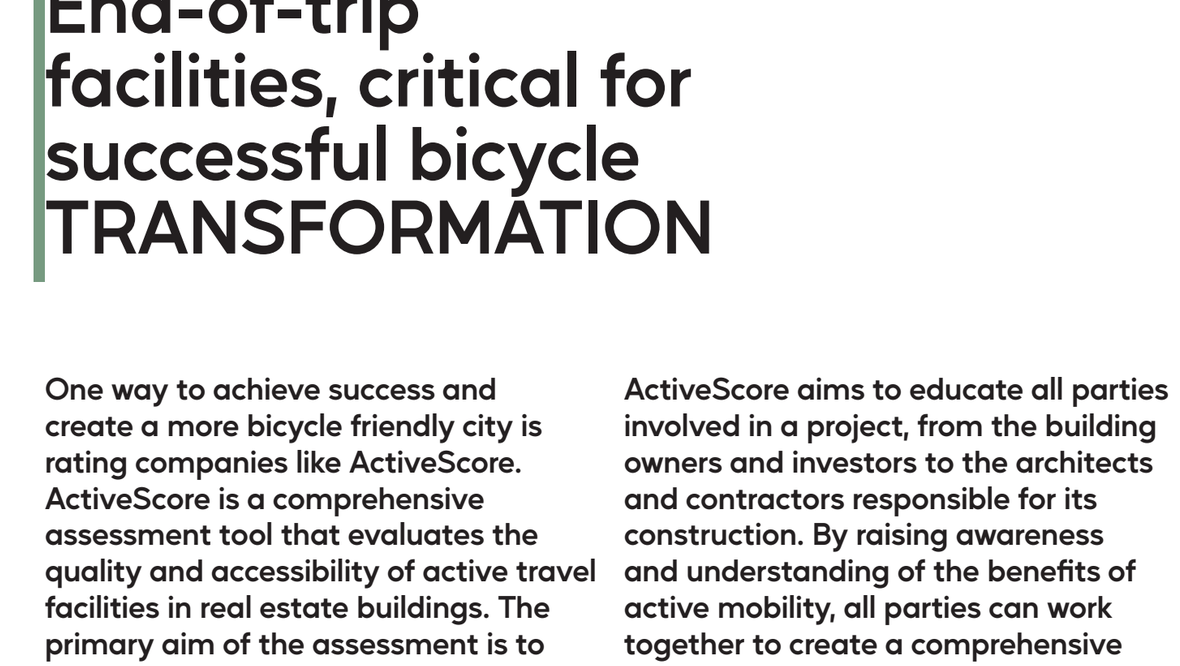
Finally, the substitution of car park spaces with bike racks or other uses can significantly reduce the number of cars on the road, thereby reducing emissions. This approach can also offer social and economic benefits, such as increased space for green areas or public squares. Integrating car parks into buildings can also reduce the land required for parking, freeing up more space for other uses. Car parks can also support the transition to low-emission transportation by providing charging infrastructure for EVs.

By embracing these two interrelated approaches, cities can successfully decarbonize and create more sustainable urban environments.

End-of-trip facilities, critical for successful bicycle TRANSFORMATION

One way to achieve success and create a more bicycle friendly city is rating companies like ActiveScore. ActiveScore is a comprehensive assessment tool that evaluates the quality and accessibility of active travel facilities in real estate buildings. The primary aim of the assessment is to increase awareness about the benefits and need for good active travel facilities.

ActiveScore aims to educate all parties involved in a project, from the building owners and investors to the architects and contractors responsible for its construction. By raising awareness and understanding of the benefits of active mobility, all parties can work together to create a comprehensive and sustainable project that benefits everyone involved. Overall, ActiveScore serves as an important tool for promoting active travel and sustainable building practices.



Cadworks, Glasgow - ActiveScore Platinum 94/100

ActiveScore's 3 pillar approach

I. Enhancing proposed building plans (infrastructure)

When analyzing proposed building plans, identify potential areas for design improvements to maximize the structure's potential for active travel.

II. Retrofitting existing buildings to be more active travel-friendly (services)

When analyzing existing buildings, seek out changes that could lead to a higher ActiveScore, while considering the existing structure's limitations.

III. Future-proofing building designs for sustainable growth

Promote active travel through building design to ensure it is future-oriented. To this end, design active travel amenities with an eye towards future growth and possible changing demands.

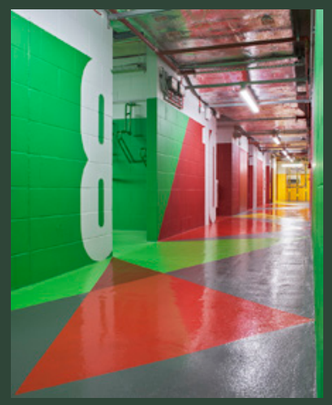
Integration into policy

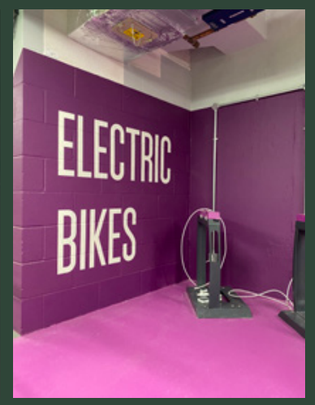
In the current urban development landscape, the emphasis on promoting active mobility tends to be directed towards the infrastructure connections within cities or neighborhoods, with little consideration given to the buildings themselves. However, individuals travel from one building to another, and therefore, the end destination should play a crucial role in facilitating active travel.

How does an ActiveScore building look?

22 Bishopsgate, London, the largest office building in Europe, is a 'vertical village', providing over 1.275 million sq ft of high-quality adaptable working space. The vision throughout is health and well-being. Along with office space, the building provides: 60th floor viewing gallery, 57th floor lounge bar club, 41st floor retreat wellness rooms, gym and climbing wall, restaurant, common exchange space and event space. Occupants choosing to actively travel to and from 22 Bishopsgate will have access to the Active Commuter Park (ACP), which includes:

- 1,200 varied bike parking spaces
- 1,372 lockers
- 75 showers (segregated)
- Maintenance and bike wash stations
- Dedicated cycle entrance
- Brompton bike hire
- Events organised by the specialist ACP team





In terms of the 'End Destination', policy makers need to enforce the inclusion of high quality active travel facilities in buildings. They can do this through their cities' planning permission requirements for new buildings. So without the provision of high quality active travel facilities a building does not get permission to be built. The City of London is a good example of where this approach is working very well. The reason 22 Bishopsgate has 1,200 bike racks and no car parking spots is because of this policy approach.

The city transformation - BENEFITS of more bicycles and fewer car parks

Smarter cities prioritize the needs of people, rather than cars.

Step 1:
Transform car parks to bicycle parking

Step 2:
Increase bicycle parking

Step 3:
Ensure adequate end destination storage/utilities for active travel

So, what happens when we reduce public and private car park spaces in the city?

We reduce cars in the city, it's that simple. Limited access to parking is an effective way to reduce car use. Furthermore, greater distance between car park and final destination also deters car driving. Today we are changing car parks into bicycle parks, just like we changed from horse parking to car parking at the turn of the century, now we are adjusting for our over adjusted car park developments.

As we build networks promoting active lifestyles with proper end destinations for bicycles, there are two direct results – less cars on the street and less traffic congestion. This in turn leads to powerful environmental, social, and economic benefits. Let's review the positive results of every bicyclist commuter:

Economic:

The economic results are far reaching and impacts not only the bicyclists, but also savings from road infrastructure (wear and tear for cars cause more road damage than bicyclists), supports local businesses (lots of studies showing bicyclists engage more with local retailers than drivers of cars), reduces traffic congestion which not only frees up time but also reduces pollution and fuel savings.

- Saves fuel gasoline (commuting and reduced traffic congestion)
- Saves time (traffic congestion)
- Saves on Road Infrastructure
- Supports local businesses
- Enhances economic competitiveness
- Poor air quality negative impact on the economy. Businesses may suffer due to decreased productivity, higher healthcare costs, and the loss of tourism
- Reduces the cost of car ownership (gas, parking, and vehicle maintenance)
- Reduces absenteeism

Environmental:

- Reduces Air Pollution
- Saves on Road Infrastructure

Social:

There are many positive social arguments for enabling bicycling, if cars are for the working class and up, one could think of the bicycle as an enabler for the low earners in society to move upwards. Also, spending more time on bicycles and less time in cars, could help improve our overall health.

- Improves safety for pedestrians and cyclists due to reduced car traffic and improved infrastructure for non-motorized transportation.
- Improves affordability for all sub-economic groups
- Increases mobility and accessibility for low income individuals
- Promotes walk-ability and liveability
- Improves public health and fitness through increased physical activity
- Enhances sense of community and social cohesion through shared bicycle programs and group rides
- Reduces absenteeism
- Reduces congestion: Active travel can help reduce traffic congestion, making our roads safer and more efficient for all users.

We will continue to research all the financial, environmental, and social impacts in our next research report.

The city transformation - BENEFITS for cities and owners/developers

As end points or end destinations for storing bicycles become more prevalent and advanced, what are the benefits for the institutions which are making the changes? How does this benefit the municipality or the city? How does it benefit the building owner or developer of future buildings?

Municipal / City benefits

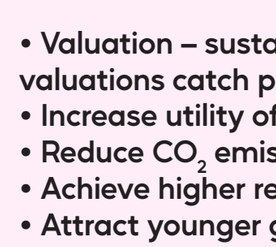
• Tax revenues – converting car parks to retail space or car parks to affordable housing helps drive higher tax revenues – retail operations make more money than car parks and property valuation of buildings are greater than car parks. The net results of rezoning car parks into something else is a positive for municipal tax revenues.
• Increase greenery rezoning
• Air pollution
• Supports smart city core principles
• Increase sidewalk space, bicycle space, bicycle parking
• Address mental & physical health issue

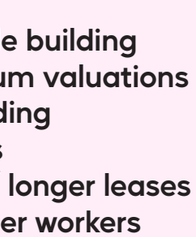
Owners / Developers

• Valuation – sustainable building valuations catch premium valuations
• Increase utility of building
• Reduce CO_2 emissions
• Achieve higher rents / longer leases
• Attract younger greener workers
• Build communities in workplaces and residential environments

Businesses

• Attract and retain talent
• Fewer sick days
• Positive promotion of health & well-being in the workplace





What is ACTIVE travel?

Designing for active travel is about creating an inclusive environment that encourages people to use a variety of physically active modes of transportation, including walking, cycling, e-biking, scooting, and more. The built environment and planning policy is largely cycling and bicycle focused (consider the CROW 'Design Manual for Bicycle Traffic'), forgetting the need to provide for all modes of active travel - e-bikes, oversized cycles (cargo or recumbents), folding bikes and scooters. By providing infrastructure that caters to the needs of different users and modes of transport, more people are likely to choose active travel options, resulting in a more sustainable, healthy, and enjoyable urban environment.
In addition to promoting physical activity, active travel can also reduce traffic congestion, improve air quality, and reduce carbon emissions, making it a crucial aspect of sustainable urban design. By prioritizing active travel infrastructure and promoting its benefits, cities can encourage more people to choose healthy, sustainable modes of transportation and create a better quality of life for everyone.

Besides reducing car park spaces in the city to enable more active transportation modes, cities can take a number of steps, including improving public transportation, creating bike lanes and pedestrian walkways, and implementing carpooling and ridesharing programs. Additionally, cities can consider implementing policies that discourage car use, such as congestion pricing, parking fees, and vehicle emission standards.

Case study - Boston, USA

City population	**694,000**
Metro population (million)	**14.4**
Car quantity	**498,660**
City area (sq km)	**124**
Cars per 1,000 population	**719**
Cars per sq km	**4,021**

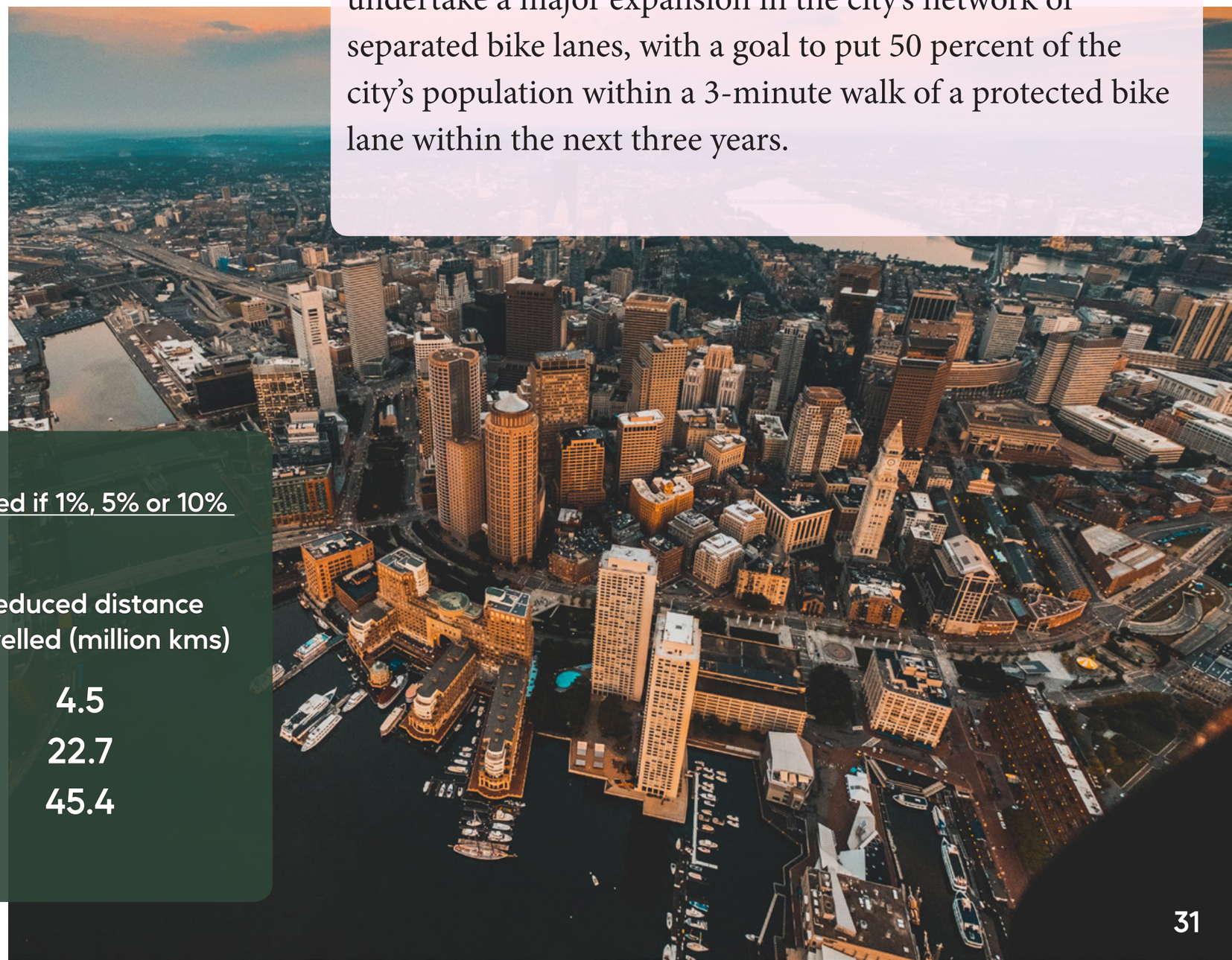
Potential CO_2 savings and reduced distance travelled if 1%, 5% or 10% of cars were replaced with bicycles

	Potential CO_2 savings (million tonnes)	Reduced distance travelled (million kms)
1%	1.14	4.5
5%	5.72	22.7
10%	11.44	45.4

STREETS BLOG MASS September 6th, 2022

Mayor Wu Announces Major Expansion of Boston's Bike Network

At a press conference in Roxbury this morning, Boston Mayor Michelle Wu announced that the city would undertake a major expansion in the city's network of separated bike lanes, with a goal to put 50 percent of the city's population within a 3-minute walk of a protected bike lane within the next three years.



Case study - San Francisco, USA

City population	**883,000**
Metro population (million)	**4.7**
Car quantity	**449,740**
City area (sq km)	**121**
Cars per 1,000 population	**509**
Cars per sq km	**3,705**

<u>Potential CO_2 savings and reduced distance travelled if 1%, 5% or 10% of cars were replaced with bicycles</u>

	Potential CO_2 savings (million tonnes)	Reduced distance travelled (million kms)
1%	1.47	5.8
5%	7.33	29.1
10%	14.65	58.1

METROPOLITAN TRANSPORT COMMISSION January 13th, 2021

Regional Active Transportation Plan

MTC envisions a Bay Area where many more people walk, bike and roll every day on safe, accessible and connected streets, paths and trails to get to people, places and transit. The Regional Active Transportation Plan will help get us there.

Case study - Paris, France

City population (million)	**2.2**
Metro population (million)	**12.2**
Car quantity (million)	**3.1**
City area (sq km)	**2,845 (metro)**
Cars per 1,000 population	**256 (metro)**
Cars per sq km	**1,099 (metro)**

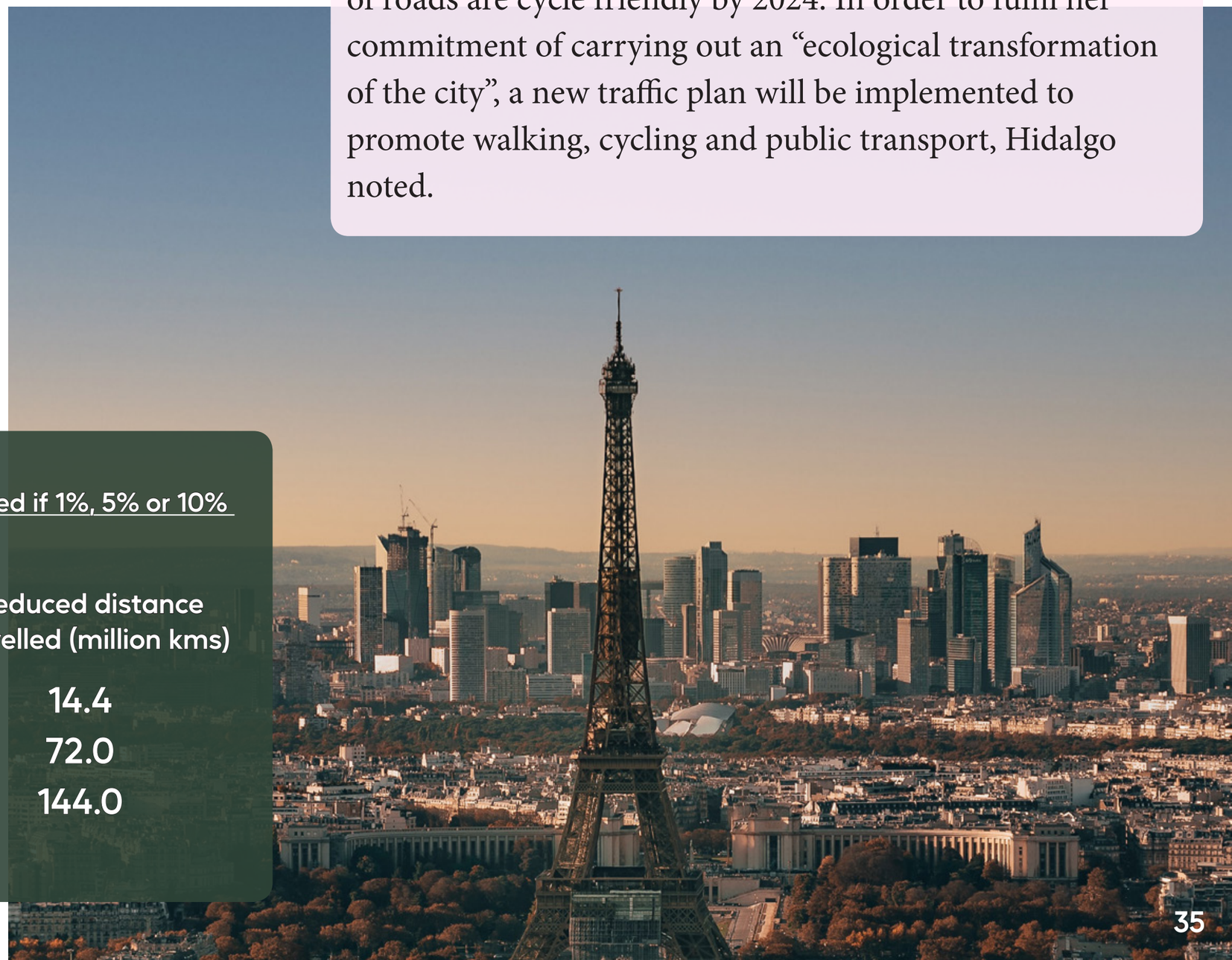
Potential CO_2 savings and reduced distance travelled if 1%, 5% or 10% of cars were replaced with bicycles

	Potential CO_2 savings (million tonnes)	Reduced distance travelled (million kms)
1%	3.62	14.4
5%	18.11	72.0
10%	36.22	144.0

Intelligent Transport January 30th, 2020

Mayor Announces Plans to Make Paris 100% Cycle Friendly by 2024

Anne Hidalgo, the Mayor of Paris, has announced her plans to transform the streets of Paris where 100 per cent of roads are cycle friendly by 2024. In order to fulfil her commitment of carrying out an “ecological transformation of the city”, a new traffic plan will be implemented to promote walking, cycling and public transport, Hidalgo noted.



Case study - Utrecht, The Netherlands

City population	**357,000**
Car quantity	**126,785**
City area (sq km)	**99**
Cars per 1,000 population	**355**
Cars per sq km	**1,277**

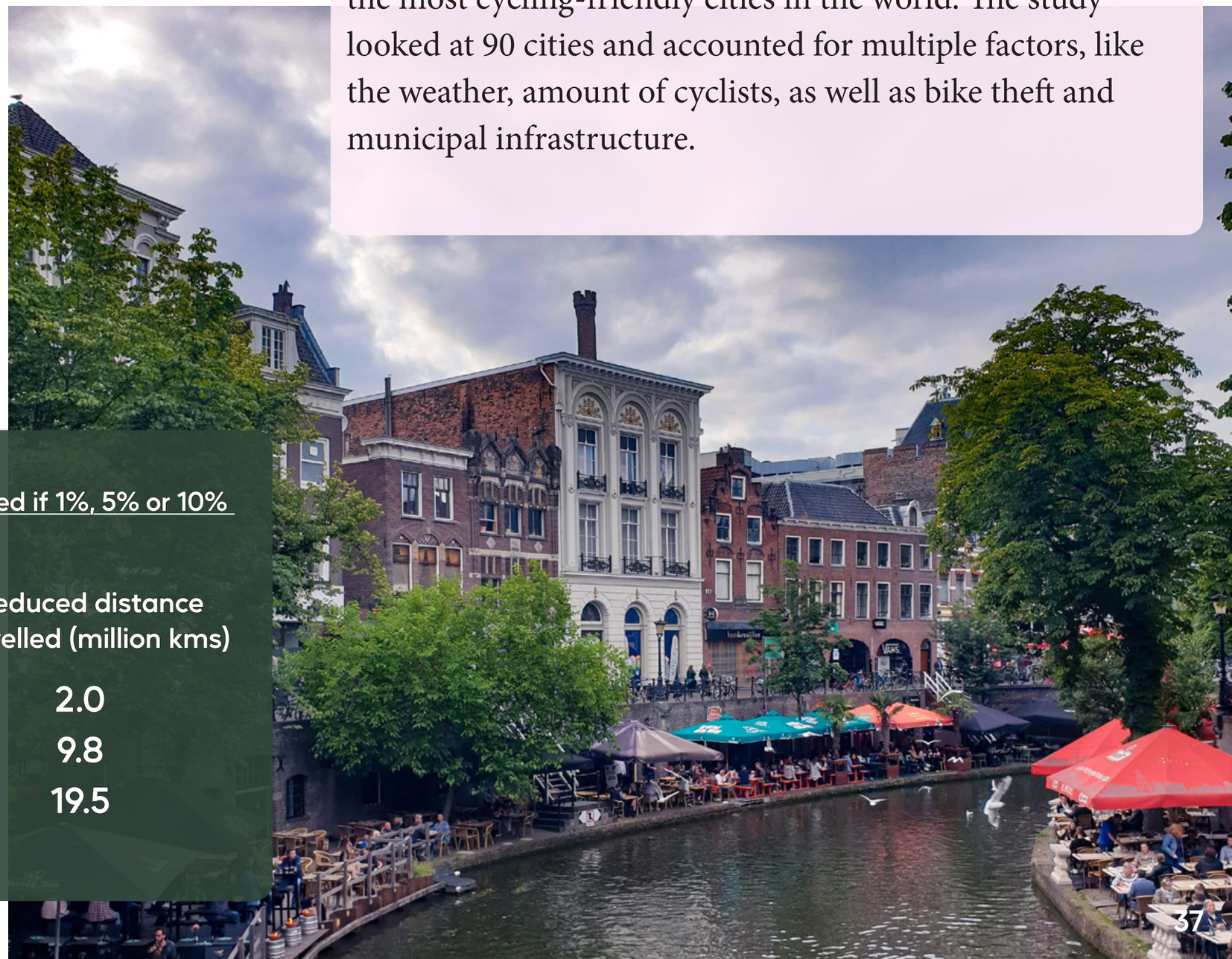
Potential CO_2 savings and reduced distance travelled if 1%, 5% or 10% of cars were replaced with bicycles

	Potential CO_2 savings (million tonnes)	Reduced distance travelled (million kms)
1%	0.49	2.0
5%	2.46	9.8
10%	4.92	19.5

The Mayer.eu August 15th, 2022

Utrecht Named Most Bike-Friendly City in the World for 2022

Last week, Luko, a major European insurtech company published its Global Bicycle Index 2022, marking out the most cycling-friendly cities in the world. The study looked at 90 cities and accounted for multiple factors, like the weather, amount of cyclists, as well as bike theft and municipal infrastructure.



Case study - London, UK

City population (million)	8.9
Metro population (million)	14.4
Car quantity (million)	2.4
City area (sq km)	1,570
Cars per 1,000 population	271
Cars per sq km	1,534 (287 metro)

Potential CO_2 savings and reduced distance travelled if 1%, 5% or 10% of cars were replaced with bicycles

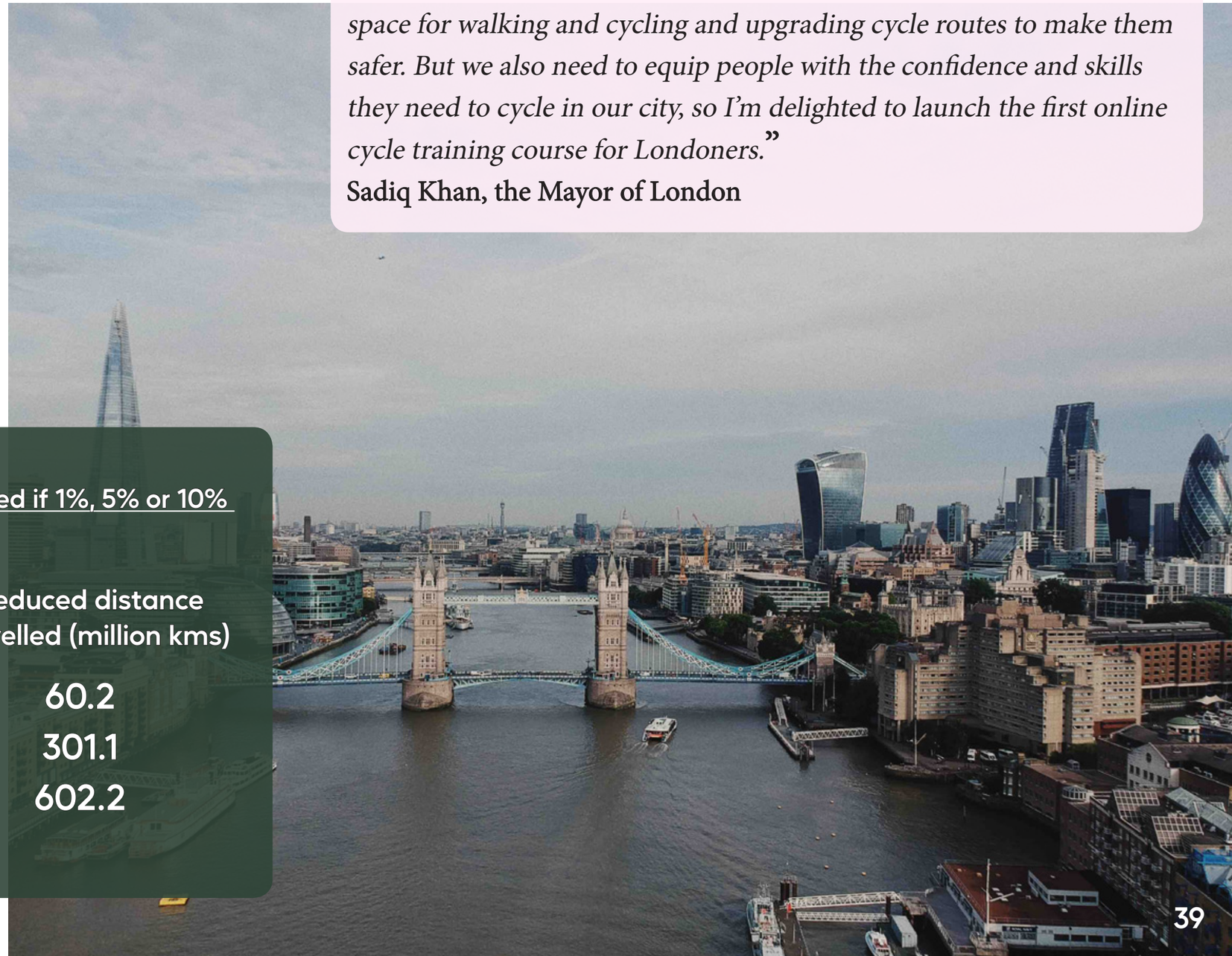
	Potential CO_2 savings (million tonnes)	Reduced distance travelled (million kms)
1%	15.18	60.2
5%	75.89	301.1
10%	151.77	602.2

LIVING STREETS July 23rd, 2020

Mayor of London Determined to do all he can to Ensure a '*Green Recovery*'

"*I'm determined to do all I can to ensure a green recovery for our city by building on Londoners' record-breaking demand for cycling over the past few months. I am proud that we are rapidly rolling out more space for walking and cycling and upgrading cycle routes to make them safer. But we also need to equip people with the confidence and skills they need to cycle in our city, so I'm delighted to launch the first online cycle training course for Londoners.*"

Sadiq Khan, the Mayor of London



Case study - Singapore, Singapore

City population (million)	5.7
Car quantity	766,950
City area (sq km)	728
Cars per 1,000 population	135
Cars per sq km	1,053

Potential CO_2 savings and reduced distance travelled if 1%, 5% or 10% of cars were replaced with bicycles

	Potential CO_2 savings (million tonnes)	Reduced distance travelled (million kms)
1%	4.66	18.5
5%	23.29	92.4
10%	46.57	184.8

Channel NewsAsia (CNA) March 5th, 2020

Expansion of Cycling Path Network to be Sped up

The development of cycling paths in Singapore is being accelerated, with such paths expected to span about 800km by 2023. This means the project would be two years ahead of the original schedule, which would have seen 750km of cycling paths in Singapore by 2025, notes Senior Minister of State for Transport, Lam Pin Min, on Thursday (March 5th) during the Ministry of Transport's Committee of Supply debate.

Case study - Melbourne, Australia

City population (million)	**5.1**
Car quantity (million)	**2.8**
City area (sq km)	**9,990**
Cars per 1,000 population	**563**
Cars per sq km	**282**

Potential CO_2 savings and reduced distance travelled if 1%, 5% or 10% of cars were replaced with bicycles

	Potential CO_2 savings (million tonnes)	Reduced distance travelled (million kms)
1%	6.32	25.1
5%	31.59	125.4
10%	63.17	250.7

CITY OF MELBOURNE June 7th, 2022

New Bike Lanes

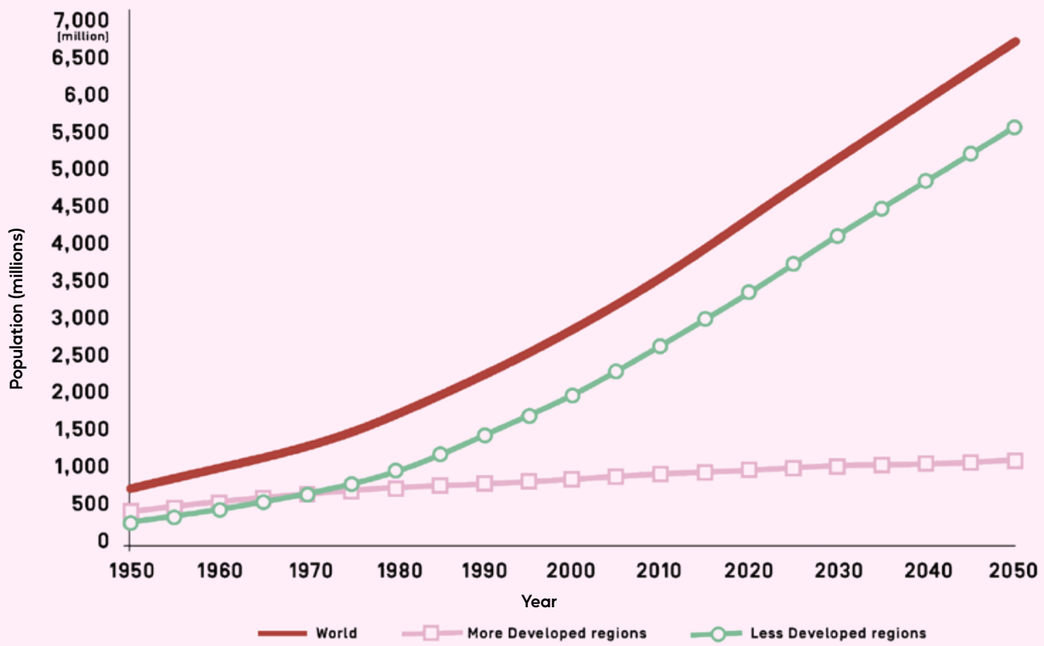
City of Melbourne is delivering 40 kilometres of protected bike lanes and pedestrian improvements across the municipality. These works are part of our program to deliver a network of new, protected bike lanes – providing a safer journey for all bike riders and road users. To date, more than 19km of bike lanes have been rolled out – resulting in a 22% increase in usage.
Bike lanes not only provide a safer journey, but also support a cleaner, greener Melbourne.

Future work

The primary focus of the initial report was to examine the dynamics of transportation within larger cities in developed nations. Given that these nations are among the largest users of passenger vehicles globally, such an inquiry was deemed pertinent. Nonetheless, future research endeavors shall extend to the developing world, wherein the potential for enhancing the urban environment exists. The complexities of these potentials vary widely, given the differences in demographics, economic circumstances, among other factors.

This can be highlighted with reference to the following graph predicting urban growth to 2050 by the UN compared "more developed regions" to "less developed regions".

Estimated and projected urban populations of the world, the more developed regions and the less developed regions, 1950-2050



City data: (list of top 583 developed cities)

Albania:
Tirana

Austria:
Vienna
Graz
Linz
Favoriten

Belarus:
Minsk

Belgium:
Brussels
Antwerpen
Gent
Charleroi

Bosnia And Herzegovina:
Sarajevo
Banja Luka

Bulgaria:
Sofia
Plovdiv
Varna

Croatia:
Zagreb

Cyprus:
Nicosia

Czech Republic:
Prague
Brno
Ostrava

Denmark:
Copenhagen
Arhus

Estonia:
Tallinn

Finland:
Helsinki
Espoo
Tampere

France:
Paris
Marseille
Lyon
Toulouse
Nice
Nantes
Strasbourg
Montpellier
Bordeaux
Lille
Rennes

Germany:
Berlin
Hamburg
Munich
Koeln
Frankfurt am Main
Essen
Stuttgart
Dortmund
Duesseldorf
Bremen
Nuernberg
Hannover
Leipzig
Duisburg
Dresden
Wandsbek
Bochum
Bochum-Hordel
Wuppertal
Bielefeld
Bonn
Mannheim
Marienthal
Karlsruhe
Hamburg-Nord
Wiesbaden
Muenster
Gelsenkirchen
Aachen
Moenchengladbach
Augsburg
Eimsbuettel
Altona
Chemnitz
Braunschweig
Krefeld
Halle (Saale)
Hamburg-Mitte
Kiel
Magdeburg
Neue Neustadt
Oberhausen
Freiburg
Luebeck
Erfurt
Harburg

Greece:
Athens
Thessaloniki

Hungary:
Budapest
Debrecen

Ireland:
Dublin

Italy:
Rome
Milan
Naples
Turin
Palermo
Genoa
Bologna
Florence
Catania
Bari
Messina
Verona
Padova

Kosovo:
Pristina

Latvia:
Riga

Lithuania:
Vilnius
Kaunas

Moldova:
Chisinau

Montenegro:
Podgorica

The Netherlands:
Amsterdam
Rotterdam
The Hague
Utrecht
Eindhoven

North Macedonia:
Skopje

Norway:
Oslo
Bergen

Poland:
Warsaw
Lodz
Krakow
Wroclaw
Poznan
Gdansk
Szczecin
Bydgoszcz
Lublin
Katowice
Bialystok
Czestochowa
Gdynia
Sosnowiec
Radom
Mokotow
Kielce

Portugal:
Lisbon
Porto

Romania:
Bucharest
Sector 3
Sector 6
Sector 2
Lasi
Cluj-Napoca
Timisoara
Craiova
Constanta
Galati
Sector 4
Brasov
Sector 5
Ploiesti
Sector 1
Braila
Oradea

Serbia:
Belgrade
Nis
Novi Sad

Slovakia:
Bratislava
Kosice

Slovenia:
Ljubljana

Slovenia:
Madrid
Barcelona
Valencia
Sevilla
Zaragoza
Malaga
Murcia
Palma
Las Palmas de Gran Canaria
Bilbao
Alicante
Cordoba
Valladolid
Vigo
Gijon
Eixample
L'Hospitalet de Llobregat
Latina
Carabanchel
A Coruna
Puente de Vallecas
Sant Marti
Gasteiz / Vitoria
Granada
Elche
Ciudad Lineal
Oviedo
Santa Cruz de Tenerife
Fuencarral-El Pardo
Badalona
Terrassa
Cartagena
Jerez de la Frontera
Sabadell
Mostoles
Alcala de Henares

Sweden:
Stockholm
Goeteborg
Malmoe

Switzerland:
Zurich

Ukraine:
Kyiv
Kharkiv
Donetsk
Odessa
Dnipro
Zaporizhzhya
Lviv
Kryvyy Rih
Mykolayiv
Sevastopol
Luhansk
Mariupol
Makiivka
Vinnytsya
Simferopol
Chernihiv
Sumy
Kherson
Poltava
Horlivka
Cherkasy
Khmelnytskyi
Chernivtsi
Zhytomyr
Rivne
Ivano-Frankivsk
Kamyanske
Kropyvnytskyy
Ternopil
Kremenchuk
Lutsk

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Leeds
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Stoke-on-Trent
Coventry
Sunderland
Brent
Birkenhead
Nottingham
Islington
Reading
Kingston upon Hull
Preston
Newport
Swansea
Bradford
Southend-on-Sea
Belfast
Derby
Plymouth
Luton
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City of Westminster
Southampton
Blackpool
Milton Keynes
Bexley
Northampton
Archway
Norwich

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Hamilton
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Surrey
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London
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Vaughan
Okanagan
Victoria
Windsor
Gatineau
Kitchener
Longueuil
Burnaby
Ladner

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Queens
Phoenix
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The Bronx
Dallas
San Jose
Jacksonville
Austin
Fort Worth
Columbus
Indianapolis
Charlotte
San Francisco
Seattle
Denver
Washington
Nashville
El Paso
Oklahoma City
Detroit
Boston
Memphis
Portland
New South Memphis
Las Vegas
Baltimore
Milwaukee
South Boston
Albuquerque
Tucson
Fresno
Sacramento
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Kansas City
Long Beach
Mesa
Staten Island
Atlanta
Colorado Springs
Virginia Beach
Raleigh
Miami
Oakland
Minneapolis
Tulsa
Wichita
New Orleans
Arlington
Cleveland
Bakersfield
Honolulu
Tampa
Aurora
Anaheim
West Raleigh
Santa Ana
Corpus Christi
Riverside
St. Louis
Lexington-Fayette
Stockton
Pittsburgh
Anchorage
Cincinnati
Ironville
Meads
Henderson
Greensboro
Saint Paul
Plano
Newark
Toledo
Lincoln
Orlando
Chula Vista
Jersey City
Chandler
Fort Wayne
Buffalo
Durham
St. Petersburg
Irvine
Laredo
Lubbock
Madison
Gilbert
Norfolk
Louisville
Reno
Winston-Salem
Glendale
Hialeah
Garland
Scottsdale
Irving
Chesapeake
North Las Vegas
Fremont
Baton Rouge
Lexington
Paradise
Richmond
Jamaica
San Bernardino
Spokane
Birmingham
Modesto
Des Moines
Rochester
Fontana
Maryvale
Tacoma
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Oxnard
Worcester
Moreno Valley
Fayetteville
Huntington Beach
Yonkers
Glendale
Aurora
Montgomery
Columbus

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Saitama
Hiroshima
Sendai
Kitakyushu
Chiba
Setagaya
Sakai
Niigata
Hamamatsu
Kumamoto
Sagamihara
Nerima
Shizuoka
Okayama
Kagoshima
Funabashi
Higashi-Osaka
Amagasaki
Hachioji
Matsudo
Himeji
Nagasaki
Matsuyama
Kanazawa
Kawaguchi
Ichikawa
Yokosuka
Nishinomiya
Utsunomiya
Urawa
Kurashiki
Gifu
Toyonaka
Oita
Omiya
Wakayama
Hirakata
Fukuyama
Takatsuki
Asahikawa
Iwaki
Fujisawa
Nara
Machida
Nagano
Suita
Toyohashi
Toyota
Takamatsu
Toyama
Kochi
Koriyama
Hakodate
Okazaki
Kashiwa
Kawagoe
Naha
Tokorozawa
Akita
Aomori
Miyazaki
Maebashi
Koshigaya
Yao
Fukushima
Yokkaichi
Akashi
Kasugai
Tokushima
Shimonoseki
Ichinomiya
Otsu
Ichihara
Neyagawa
Ibaraki
Fukui
Yamagata
Hiratsuka
Sasebo
Shimizu
Hachinohe
Kakogawa
Takasaki
Morioka
Mito
Kurume
Fuji
Kure
Numazu
Fuchu
Soka
Kushiro
Hitachi
Takarazuka

Australia:
Melbourne
Sydney
Perth
Adelaide
Brisbane
Gold Coast
Newcastle
Canberra
Wollongong
Logan City
North Shore

Singapore:
Singapore

South Korea:
Seoul
Busan
Incheon
Daegu
Daejeon
Gwangju
Suwon
Goyang-si
Seongnam-si
Ulsan
Bucheon-si
Ansan-si
Jeonju
Cheonan
Hwaseong-si
Cheongju-si
Anyang-si
Kimhae
Changwon
Pohang
Jeju City
Uijeongbu-si
Masan
Gumi
Gwangmyeong
Wonju
Chinju
Iksan
Yeosu
Gunpo
Mokpo
Hanam
Gunsan
Suncheon
Sejong
Chuncheon
Chungju

Taiwan:
Kaohsiung
New Taipei
Taichung
Tainan
Taipei
Taoyuan
Chiayi
Hsinchu
Keelung
Changhua

Footnotes:

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Greenhouse Gas Emissions from a Typical Passenger Vehicle
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Car fuel and CO2 emissions data
https://www.gov.uk/co2-and-vehicle-tax-tools

Bloomberg data
https://www.bloomberg.com

Organisations that support ActiveScore's mission can be seen below.

Contact us to add your organisation name to the movement.

a4mt ACTION FOR MARKET TRANSFORMATION

ByCycle

Future Mobility Network

NIELSEN CONCEPT mobility

BICYCLE NETWORK®

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CYCLE FRIENDLY EMPLOYER IRELAND

Urbanite ADVISORS

Turley

Knight Frank

HOLLIS

TFT

ActiveScore
activetravelscore.com

ESG REAL ESTATE LAB
esgrelab.com

Future Mobility Network
thefuturemobility.network