



Photo Credit: Metrô Metropolitana de Belo Horizonte

# EcoMobility Alliance Report 2018

[www.ecomobility.com](http://www.ecomobility.com)



Kaohsiung City



**EcoMobility**  
An ICLEI Initiative



**Local  
Governments  
for Sustainability**

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## Forewords



It is indeed an honor to act as the Chair of the EcoMobility Alliance for the past three years. Kaohsiung City has been actively designing an ecomobile transportation system to foster healthier lifestyles. Our work on ecomobility is based on the premise that a sustainable mobility system is fundamental to economic progress and personal wellbeing and to realizing the 17 Sustainable Development Goals (SDGs) by 2030.

Change in the mobility scene in the past years has been fueled by digitalization, prompting cities to proactively guide and create the sustainable urban mobility future that we want. The Kaohsiung Strategies for the Future of Urban Mobility, based on the Shared Mobility Principles, provide twelve guiding principles that help local governments transform their transportation system and mobility patterns to be less automobile-dependent and more people-oriented. This EcoMobility Alliance Report 2018 showcases how our EcoMobility Alliance cities plan their cities based on the Kaohsiung Strategies.

During our tenure as the EcoMobility Alliance Chair, we in Kaohsiung have invested in various interventions to promote and strengthen ecomobility in order to improve road safety and air quality. Some of these interventions include the electrification of the transport sector, the creation of Clean Air Zone, the testing of autonomous vehicles in real-world conditions and the organization of the EcoMobility World Festival 2017, which transformed a historical Hamasen neighborhood into an ecomobile space for people. As a result, road fatalities fell by 16.5 percent and all city bureaus supporting the ecomobility planning approach.

We look forward to working with the next EcoMobility Alliance Chair and cities in the coming years. We believe that the EcoMobility Alliance cities will be an inspiration to all cities worldwide and make sustainable urban mobility a norm.

Han Kuo-Yu  
**Mayor**  
 Kaohsiung City



Today, the transport sector is responsible for a significant source of greenhouse gas emissions, and is a cause of health problems due to the air and noise pollution it generates. Traffic congestion is a prevalent phenomenon in many cities due to unsustainable, car-centric transport planning. Unsustainable transport impacts are most pronounced in developing cities, which will be the site of the greatest population growth in the coming decades. The notion of “ecomobility” is assuredly a worthy cause in cities’ quest to develop more sustainable, livable and people-oriented mobility system.

The EcoMobility Alliance seeks to encourage city-to-city knowledge exchange and drive local innovation, trusting that such activities will inspire local leaders to create an ecomobile transportation system that prioritizes walking, cycling, public transport, shared mobility and light electric vehicles. This EcoMobility Alliance report 2018 showcases our progress so far and highlights the impressive achievements of the EcoMobility Alliance cities. All EcoMobility Alliance cities are interesting to study as they have all excelled in one way or another in creating a sustainable urban mobility system. We want to extend our appreciation to all EcoMobility Alliance partner organizations and cities that made these ecomobility efforts possible.

Last but not least, we express our most sincere gratitude to Kaohsiung City for the generous hospitality and support it has offered while chairing the EcoMobility Alliance for the past three years. From the city’s successful organization of an entirely ecomobile neighborhood during the EcoMobility World Festival 2017 to the innovations it continues to make, we admire Kaohsiung’s commitment to ecomobility. We hope to collaborate with more cities to guide mobility towards a sustainable and ecomobile future.

*Gino Van Begin*

**Secretary-General**  
 ICLEI-Local Governments for Sustainability



# About the EcoMobility Alliance

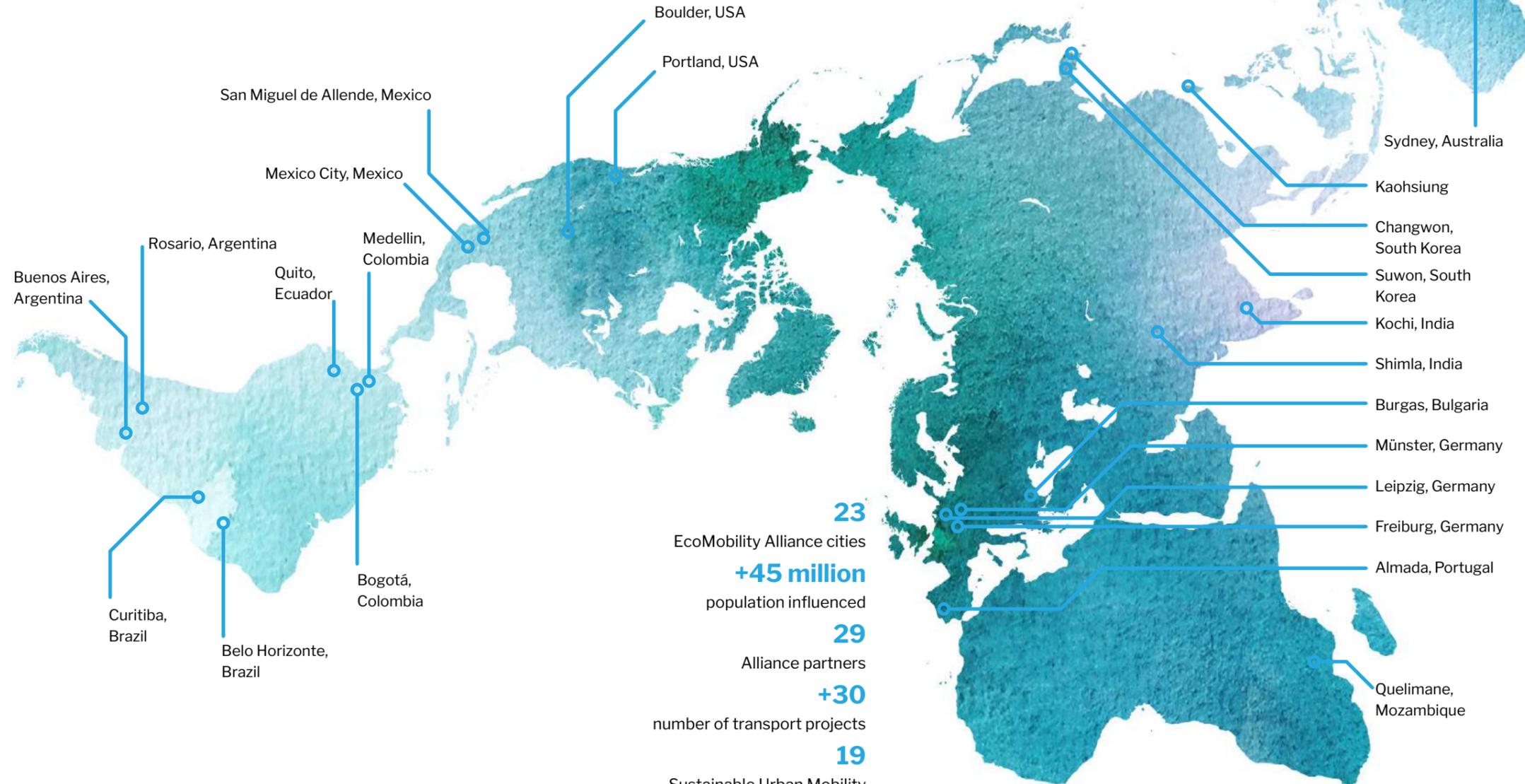
**EcoMobility gives priority to walking, cycling, public transport, and shared light electric vehicles. It promotes commute through integrated, socially inclusive, and environmentally-friendly options without depending on privately-owned vehicles.**

The **EcoMobility Alliance** is a network of ambitious cities, led by innovators and visionaries, supported by experts and businesses, committed to building a sustainable mobility future that is efficient, people-centered, low emission and environmentally-friendly.

ICLEI – Local Governments for Sustainability is a global network of more than 1,750 local and regional governments committed to sustainable urban development. Through our collective efforts, we impact more than 25 percent of the global urban population. Through the EcoMobility agenda, ICLEI supports its members in creating people-friendly, climate neutral and socially inclusive mobility options that benefit the urban ecomobility.

The EcoMobility Alliance was founded in 2011 with six cities and has since grown to 23 cities from various regions of the world. Since its inception, the EcoMobility Alliance has worked to become a truly global actor by engaging a geographically diverse range of cities and partners. Cities that have joined have shown significant efforts to advance and implement sustainable urban mobility.

The Alliance reinforces the local governments' commitments to the Sustainable Development Goals (SDG) by transforming the transportation systems and reconfiguring mobility patterns, with an aim to reduce automobile dependency and increase low-emission and people-centered mobility efforts. To reach this vision, the *Kaohsiung Strategies for the Future of Urban Mobility* have been formulated to guide cities. These strategies focus on integrated urban planning, improving health and quality of life, reducing dependency on private automobiles and applying sustainability principles in passenger and freight mobility.

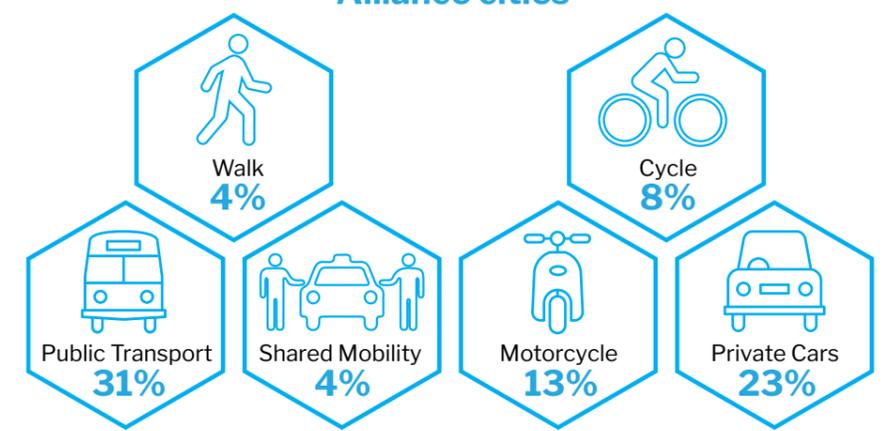


# EcoMobility Alliance in Numbers

EcoMobility Alliance cities:

- 23** EcoMobility Alliance cities
- +45 million** population influenced
- 29** Alliance partners
- +30** number of transport projects
- 19** Sustainable Urban Mobility Plans (SUMPs)
- 68%** of the Alliance cities residents walk, cycle and use public transport
- 78%** cities have bike sharing system, representing
- 87%** piloted electric mobility solutions (and will pilot in 2019)
- 77%** report their GHG emissions

## Modal Split amongst Alliance cities



**SDG 11.2** By 2030, provide access to **safe, affordable, accessible and sustainable** transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons.



# EcoMobility Alliance Partners

In 2018, the EcoMobility Alliance has successfully partnered with the following organizations. These partners provide technical support to the Alliance cities, either directly or through joint activities involving the cities.



8-80 Cities



Asian Development Bank



Centre for Green Mobility (CGM)



Cooperation for urban mobility in the developing world (CODATU)



Clean Air Asia, Manila



Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)



European Institute for Sustainable Transport (EURIST)



European Cyclists Federation



FIA Foundation



Fundación Despacio



International Council on Clean Transportation | ICCT



Innovationszentrum für Mobilität und gesellschaftlichen Wandel (InnoZ) GmbH



Institute for Transportation and Development Policy (ITDP)



National Taiwan University



nextbike



SLoCaT, Partnership on Sustainable Low Carbon Transport



Sharing Opportunities for Low carbon Urban transportION (SOLUTIONS)



SMART, University of Michigan



Smart Freight Centre



The William and Flora Hewlett Foundation



Transformative Urban Mobility Initiative (TUMI)



Viva Cities



Walk 21



World Cycling Alliance (WCA)



WRI Ross Center for Sustainable Cities



World's Road Transport Organisation (IRU)



World Wide Fund for Nature (WWF)



Wuppertal Institute for Climate, Environment and Energy



Zaragoza Logistics Center (ZLC)

# Workshops and events



**Mayors-on-the-Move Roundtable**  
Paris, France, 18 October 2018

This Roundtable organized at the Autonomy & the Urban Mobility Summit brought mayors and city leaders to share the actions taken in their cities to welcome new mobility solutions and advance mobility innovation.



**ICLEI World Congress 2018**  
Montreal, Canada, 19 – 22 June 2018

Seven sessions were organized on passenger and freight mobility. Different EcoMobility Alliance cities and partners were represented to share insights on how mobility transition can be achieved in both developing and industrial legacy cities to create a livable and sustainable city for all. A Green lane and active mobility site visit was organized together with the City of Montreal to enjoy the various public space that was co-created by the residents.



**EcoMobility Alliance cities in action**  
Kaohsiung, 2 October 2017

During the EcoMobility World Congress 2017, EcoMobility Alliance cities presented activities and achievements within the Alliance by carrying out the vision of vibrant cities where residents and organizations can access goods and services in an eco-friendly manner.



**Mayors Commitment to EcoMobility in Cities**  
COP23, Bonn, Germany, 23 November 2017

City leaders, including those from the Alliance cities, came together at the Cities & Region Pavilion at COP23 to present the actions they have taken to advance ecomobility in their cities. The Kaohsiung Strategies for the Future of Urban Mobility was further endorsed by city leaders in Bonn and was discussed and mentioned in transport meetings elsewhere at COP23.



**International Summer School: Made in Leipzig II**  
Leipzig, Germany, 5 – 11 August 2018

Co-organized with the City of Leipzig and Transformative Urban Mobility Initiative (TUMI), the second edition of the summer school drew about 200 participants consisting of technical staffs from cities, companies, and organizations. One of the key focuses was on the main ring road in Leipzig's city center. Participants explored soft and hard solutions through four interactive workshops.



**World Urban Forum (WUF)**  
Kuala Lumpur, Malaysia, 7-13 February 2018

During the WUF, the Alliance contributed in various side events, notably the sessions on "Achieving slower cities" and "Navigating the new urban mobility world." One of the noteworthy messages is sustainable urban mobility cannot be achieved without proper urban planning.



**Unexplored aspects of transportation in urban resilience**  
Bonn, Germany, 4 – 6 May 2017

Built infrastructure for transportation, energy, water, wastewater, healthcare and communication systems are increasingly vulnerable to climate change impacts. A session during Resilient Cities 2017 gathered several EcoMobility Alliance cities to discuss how resilience can be strengthened in relation in mobility system.



**"TUMI Practitioners" Conference on "Strengthening Urban Mobility Governance"**  
Leipzig, Germany, 31 May – 2 June 2017

Under the umbrella of International Transport Forum (ITF) focused on "Governance and Transport," ICLEI's EcoMobility team hosted a workshop as part of the ITF program for urban transport practitioners, together with the German Development Ministry's (BMZ) Transformative Urban Mobility Initiative and the City of Leipzig.



### EcoMobility Days Quito 2016

Quito, Ecuador, 16 – 20 October 2016

The EcoMobility Days combined the main elements that the Alliance offers its members: support cities to enhance its sustainable mobility; allow for good practice exchanges; provide tools and methodology for training and provide a space of high-level discussions. In total, 60 speakers from more than 25 countries exchanged practices, visions of the future of urban mobility and concrete tools during the intense 5-day program attended by over 250 participants.



### International EcoMobility Forum 2015

Kaohsiung, 24 -25 September 2015

The EcoMobility Forum set in motion a more substantial discussion in Kaohsiung on how cities embrace a car-lite development trajectory. Supported by the European Chambers of Commerce Taiwan (ECCT), the workshop drew examples from India, Japan, Europe, and the Americas to demonstrate that mobility in cities must be focused on ecomobility.



### Non-Motorized Transport Workshop

Suwon, South Korea, 2 September 2013

In Suwon, Alliance cities not only had their workshop but took part in the broader EcoMobility Congress, held in Suwon at the same time. The events were part of the first EcoMobility World Festival. This workshop was conducted in partnership with the Asian Development Bank and the German International Cooperation Agency (GIZ). It brought together over 60 policymakers and researchers, showcasing various measures to active mobility.



### Creating Livable Cities through Public Space & Transport

Changwon, Republic of Korea, 18 – 23 November 2012

Participants at the first Alliance workshop held in Changwon discussed the importance of people-friendly urban spaces. The workshop concluded that urban space could be free and attractive when they are designed for people rather than automobiles.



### EcoMobility Dialogues Workshops 2015

Johannesburg, South Africa, 5 – 9 October 2015

The EcoMobility Dialogues adopted an innovative approach, discussing specific themes at length to address the topics in a holistic manner and with recognition of both global and local impacts. Alliance cities and experts also met to consider transport about climate change.



### Walking, Cycling, Transit, and Health

Sydney, Australia, 21 – 23 October 2014

This workshop took place right after the Walk21Conference, setting in motion the idea of extending the mobility performance measurement scheme to cities in the Alliance. Sydney also took up the challenge of being the first city to conduct the SHIFT assessment for its mobility performance.



### Creating a Bicycle-Friendly City

Muenster, Germany, 22 – 24 April 2013

The second EcoMobility Alliance workshop focused on creating a bicycle-friendly city. Participants explored traffic safety solutions with a particular emphasis on bicycle safety and identified requirements to increase cycling. The topic of helmet use as a safety measure prompted an animated debate.

# EcoMobility World Congresses

The EcoMobility Congress series provides a platform for international actors, united by a shared interest in sustainable mobility, to share best practices and spark synergies in a setting that promotes creative collaboration, local initiatives, and the EcoMobility agenda.

### EcoMobility World Congress 2017

Kaohsiung, 2 – 4 October 2015

EcoMobility World Congress 2017 demonstrated how sustainable mobility can be livable, shared and intelligent, mirroring what Kaohsiung demonstrated throughout the EcoMobility World Festival. The congress attracted 1,200 participants from 31 countries, including 37 mayors or vice mayors and 57 other city representatives. Eighty-one speakers shared their experience and commitment to implementing ecomobility in their cities over 25 high-level discussions and roundtables.

[More information: kaohsiung.ecomobilityfestival.org](http://kaohsiung.ecomobilityfestival.org)

### EcoMobility Dialogues 2015

Johannesburg, South Africa, 5 – 9 October 2015

The EcoMobility Dialogues explored solutions to reduce the dominance of private automobiles in cities and to build an urban transport system that meets the needs of residents while minimizing energy consumption, emissions, material use, and space requirements. The topics of the three dialogues were:

- Reshaping cities for ecomobility: Strategies and tactics
- Achieving and enabling ecomobility: New and shared forms of mobility
- Making the commuting decisions safe, sustainable and popular

[More information: joburg.ecomobilityfestival.org](http://joburg.ecomobilityfestival.org)

### EcoMobility Congress 2013

Suwon, Republic of Korea, 1 – 4 September 2013

The Congress highlighted the importance of ecomobility from a range of perspectives, including local leadership, social inclusion, health, and practical applications. The Congress emphasized the integration, development, and promotion of active modes such as walking, cycling, wheeling. It also underscored EcoMobility as a dynamic concept, something to be applied and developed.

[More information: suwon.ecomobilityfestival.org](http://suwon.ecomobilityfestival.org)

### EcoMobility Congress 2011

Changwon, Republic of Korea, 21 – 24 October 2011

The first EcoMobility Congress was started in Changwon, South Korea where the EcoMobility Alliance was also first launched. The Congress in Changwon coined the phrase “EcoMobility” and established why it is necessary in cities.



Photo Credit: ICLEI-Local Governments for Sustainability

# EcoMobility World Festivals

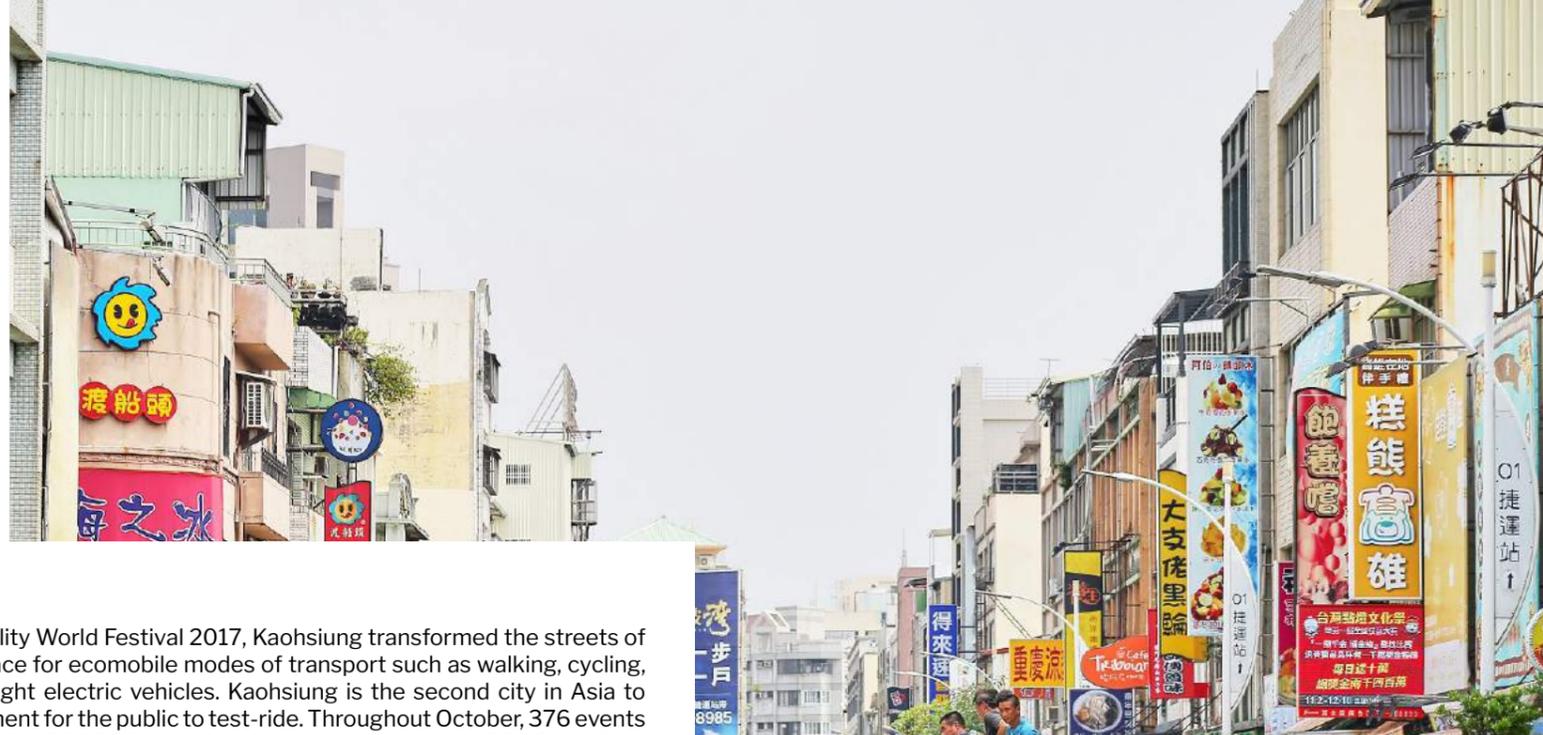
The EcoMobility World Festival series by ICLEI shows that an ecomobile lifestyle can be promoted in cities around the world. The Festival transforms a neighborhood or a business district in a city into car-free and ecomobile area for a month. Implementing the Festival demonstrates the possibilities of an innovative and forward-thinking urban mobility culture.

## EcoMobility World Festival 2017 Kaohsiung

October 2017, City of Kaohsiung

After two years of intensive preparation for the EcoMobility World Festival 2017, Kaohsiung transformed the streets of the historical Hamasen neighborhood into dedicated space for ecomobile modes of transport such as walking, cycling, and public transport and various forms of shared and light electric vehicles. Kaohsiung is the second city in Asia to showcase an autonomous shuttle in a real urban environment for the public to test-ride. Throughout October, 376 events were organized with 364 guided tours in Hamasen, attracting 300,000 visitors to the neighborhood and 90,000 visitors to the EcoMobility exhibition. As a result, 62 percent of private vehicle trips were replaced with ecomobile options.

Read more: "Going Green – Experiencing the Ecomobile Lifestyle" Binyu Chiu and Konrad Otto-Zimmermann Jovis Berlin 2018, ISBN 978-3-86859-512-3."



## EcoMobility World Festival 2013 Suwon

September 2013, Suwon, Republic of Korea

Suwon set the wheels of change in motion by organizing the world's first month-long presentation of innovation and forward-thinking urban transportation culture. 4,343 residents in Suwon city used a combination of walking, cycling, public transport and various other ecomobile modes for the entire month of September. About 10.3 million USD were invested in Haeggung-dong neighborhood for an extensive regeneration program, including street and façade improvements, the transformation of street lanes to encourage pedestrian use, the creation of green pocket parks and various initiatives under the "City Renaissance Housing Improvements" program. Throughout the month, more than 1 million visitors from 50 countries visited the city. Today, an EcoMobility Bureau is continuously engaging the residents to replicate the success of Haeggung-dong in other parts of the city.

Read more: "Neighbourhood in motion" Konrad Otto-Zimmermann and Yeonhee Park (eds) Jovis Berlin 2015, ISBN 978-3-86859-294-8



## EcoMobility World Festival 2015 Johannesburg

October 2015, Johannesburg, South Africa

By organizing the 2015 Festival, the City of Johannesburg triggered a behavioral change from private car use towards ecomobility and kick-started the process of decongesting Sandton, the central business district of Johannesburg. Through measures such as the establishment of dedicated public transport lanes and ten park-and-ride facilities, the Festival successfully reduced private car usage in Sandton by 22 percent, while walking increased by five times along West Street. The modern rapid rail network, Gautrain, increased its ridership from 8.1 percent to 9.7 percent between July and October 2015. Arising from a partnership with the minibus taxi industry, 100 taxis provided free minibus taxi services as feeders in and around Sandton. The Festival attracted so much attention globally that the hashtag #joburgetcomobility had approximately 26 million impressions.

Read more: "Change the way you move. Tobias Kuttler and Theresa Zimmermann Jovis Berlin 2016, ISBN 978-3-86859-424-9."



Interested to host the next EcoMobility World Festival?

Please contact us at [ecomobility@iclei.org](mailto:ecomobility@iclei.org)



# Declarations

Declarations serve as statements in the international discussions on mobility, climate change, and sustainable urban development. They call upon local decision makers as well as spheres of government, international organizations and financial institutions to support the urgently needed paradigm shift in urban mobility.

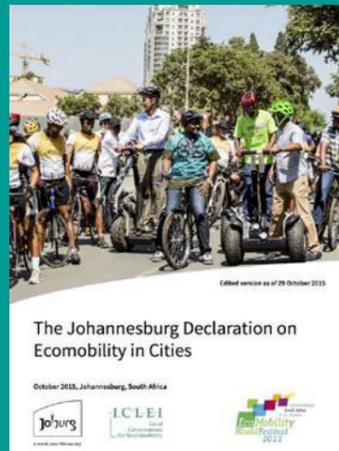
ICLEI's declarations summarized the recommendations and commitments gathered from the EcoMobility World Festival and Congress series. They serve as guiding principles and strategies for local governments to works towards.



## The Kaohsiung Strategies for the Future of Urban Mobility, 2017

Based on the Shared Mobility Principles for Livable Cities, the Kaohsiung Strategies inspire local governments to transform their transportation systems and mobility patterns to become more sustainable, low-carbon, people-centered and less automobile dependent. It has also become a guideline for ICLEI's Sustainable Urban Mobility/EcoMobility work.

The Kaohsiung Strategies strengthen ecomobile solutions by promoting walking, cycling, public transport and shared mobility as the foundation for future urban mobility. It calls for spirited debate on the opportunities, challenges and threats of emerging trends, new technologies, subsidies and bans.



## The Johannesburg Declaration on EcoMobility in Cities, 2015

The Johannesburg Declaration calls local, regional and national governments to commit to local actions that improve road safety, air quality, energy efficiency, and accessibility through ecomobility. It also highlights the importance of equitable and inclusive urban development, in line with the Sustainable Development Goals (SDGs).



## Suwon EcoMobility Impulse, 2013

The purpose of the Suwon 2013 EcoMobility Impulse is to provide guiding thoughts, principles, examples and starting points for concrete improvements in urban planning & development, be it for existing municipalities or new towns, towards the greening of mobility in our cities worldwide.

Read all Declarations here in different languages

<https://ecomobility.org/resources/declarations/>

# Tool: EcoMobility SHIFT



The **EcoMobility SHIFT** scheme is a total quality management tool created by academia, non-governmental organizations and cities for use and implementation in cities. The tool enables cities to measure the performance of urban mobility, to establish a baseline and to identify areas for further development, ultimately helping cities to change their urban transport development trajectory and mobility plans.

By using EcoMobility SHIFT and acting upon the resulting assessments, cities will see improvements not only in the areas of transportation and mobility but also the urban environment and health. The SHIFT scheme uses two procedures: a procedure to assess a city's performance and an audit procedure to verify performance. Using the results of both components, both short- and long-term improvement paths can be established.

The EcoMobility SHIFT scheme was launched in 2013 has been adopted by European and Australian cities. In 2018, the scheme was updated to reflect the current debates on urban mobility system that is suitable for both developed and developing cities, known as **EcoMobility SHIFT+**. While the original EcoMobility SHIFT scheme examines 20 indicators, the EcoMobility SHIFT+ scheme examines 23 indicators under three categories: Enablers, Transport system and services, and Performance.

## Benefits for the cities to conduct assessment

- Understanding the status of the mobility system and its contribution to sustainable development;
- Get feedback for the efforts put in by the city leaders in improving the city's mobility system;
- Analyze the performance and situation in the city to identify areas for further improvement and thus strengthen the mobility plans;
- Give recognition to the city leaders of the work done to improve quality of life for residents;
- Access and contribute to knowledge and good practice examples;
- Become more efficient and effective with improved priorities; and
- Become a source of inspiration to other cities.

## EcoMobility SHIFT+ indicators

Enablers	Transport systems & services	Performance
E1: Understanding user's needs & public participation	TSS 1: Walking conditions	P1: Modal split
E2: Vision, strategy & leadership	TSS 2: Cycling conditions	P2: Safety
E3: Human resources	TSS 3: Public transport usability & reliability	P3: Local air quality
E4: Finance for ecomobility	TSS 4: Equitable access	P4: Travel time
E5: Monitoring, evaluation, review	TSS 5: Shared mobility services	P5: GHG emissions
E6: Preparedness for the future of mobility	TSS 6: Engagement with informal mobility	
	TSS 7: Intermodal integration & information services	
	TSS 8: Ecologistics	
	TSS 9: Low emission vehicles	
	TSS 10: Planning of city areas	
	TSS 11: Parking	
	TSS 12: Low-speed/ car-free zones	



Photo by H. Erme from Pexels

Get your city's performance measured

The EcoMobility team is available to help cities measure urban transport performance, monitor progress, and benchmark outcomes

<http://ecomobility.org/ecomobility-shift/>

# Projects

These are the projects which the EcoMobility Alliance supports or projects that involved the EcoMobility Alliance cities.

## CitiesSHIFT: Capacity building and networking for people and climate-friendly cities

2018 – 2019

The overarching goal of the project is to support cities to identify challenges and opportunities of its urban mobility system in the hope that the city could shift towards more ecomobile modes of travel such as walking, cycling, shared and public transport. To achieve this goal, the project will work with six selected project cities from China, India, and Uganda through three intervention points: performance measurement using the EcoMobility SHIFT tool, capacity building for city officials and global dissemination of results.

The SHIFT tool will be used to conduct performance measurement for all project cities. One key benefit of this process is that it will engage different actors. The project will also strengthen institutional capacity on planning for sustainable mobility through thematic working groups that facilitate knowledge exchange and transfer amongst project cities, existing EcoMobility Alliance cities and with technical partners. Learning outcomes and experiences gained will be collated and disseminated in the form of case studies and/or presentations at international workshops and conferences. While this project seeks to benefit project cities through the interventions mentioned, it also encourages replication in other cities within the project country.

*Project cities: China; Ludhiana and Visakhapatnam, India; Entebbe and Jinja, Uganda*

## EcoLogistics: Low carbon freight for sustainable cities

2017 – 2022

Urban freight's contributions to GHG emissions are increasing, and the capacity of local actors to mitigate against this is low. This project will promote low carbon urban freight policies and practices (EcoLogistics) that incorporate the ambitions of local Nationally Determined Contributions (NDCs). By highlighting EcoLogistics as a priority area for local and national governments, the project will raise awareness, collect and develop policy recommendations and action plans and guide pioneering cities to implement sustainable urban logistics.

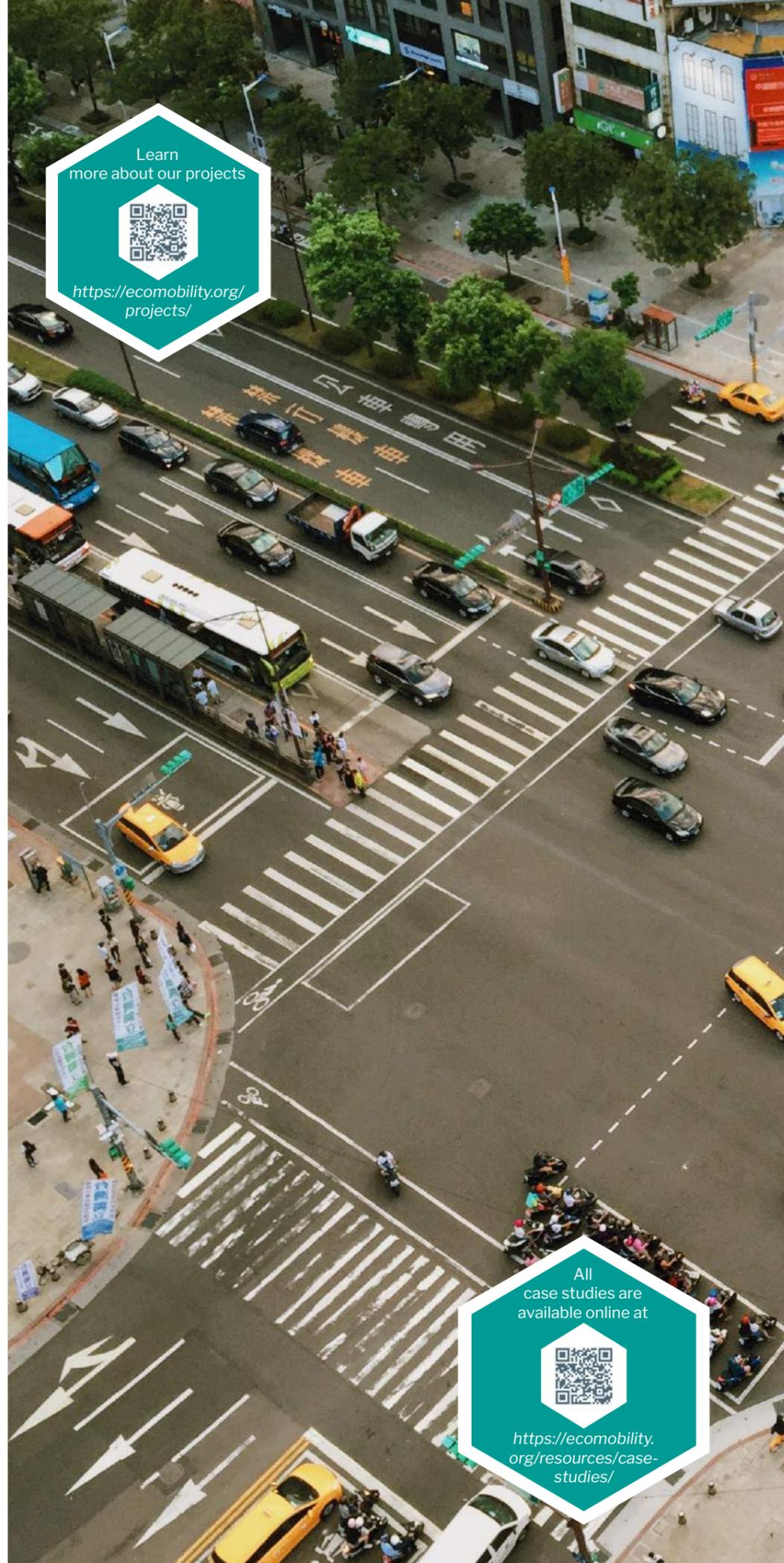
The project will strengthen institutional capacity through multi-stakeholder participation, develop an urban freight emission assessment tool, implement demonstration projects in cities, and suggest national policy recommendations. A globally accessible project platform will share knowledge on good practices and provide access to solution providers.

*Project cities: Bogotá, Colombia; Metropolitan Area of Valle de Aburrá Medellín, Colombia; Rosario, Argentina, Kochi, India; Panaji, India*

## Transformative Urban Mobility Initiative

ICLEI is one of the founding partners of the Transformative Urban Mobility Initiative (TUMI). As part of this network, ICLEI is responsible for the TUMI Network of High Ambition Leaders that enables leaders in Africa to create sustainable urban mobility initiatives. Aside from offering technical support, the Transformative Urban Mobility challenge also offers financial support for innovative ideas. In the TUMI Challenge, ten cities from developing countries can be awarded funding up to € 200,000 to realize their urban mobility visions. On top of that, the winners benefit from services including onsite consulting, project implementation support and priority access to TUMI partners' activities. In 2018, project topics could cover a wide range from active mobility, street design, new operating models to e-mobility.

*Project region/ cities: Africa*



# Publications

Advanced and sustainable transportation policies can be found around the globe. Several cities have formulated ambitious targets, some have developed outstanding examples and some have tangible results to present. To record these achievements, the EcoMobility Alliance has compiled the following.

## Case Studies 2012 – 2018

- The journey of Bogotá, Colombia: Leveraging on technology and data to map out street safety for women and girls, 2018
- Freiburg im Breisgau, Germany: Creating a livable city through ecomobility, 2018
- Mexico City: The role of public transport and shared mobility in moving towards sustainable urban development, 2018
- Münster, Germany: Advancing sustainable development: the role of public transport, 2018
- Rosario, Argentina: Moving forward: The successful reform of public transportation and active mobility, 2018
- Singra Municipality, Bangladesh: Enhancing e-mobility for safer and cleaner local transport, 2018
- Ahmedabad, India: India's first full Bus Rapid Transit (BRT) System, 2010
- Almada, Portugal: Special delivery A Sustainable Urban Logistics Plan, 2017
- Belo Horizonte, Brazil: A safety-first strategy for sustainable mobility, 2017
- Bologna, Italy: Reducing car traffic to protect city heritage, 2010
- Bonn, Germany: Enabling companies to address mobility management, 2013
- Boulder, Colorado, USA: An example of an integrated transportation system, 2013
- Bremen, Germany: A role model for car-sharing is targeting 20,000 users by 2020, 2013
- Bremen, Germany: Rapidly growing intermodal transportation, 2010
- Changwon, Republic of Korea: The Nearby Useful Bike, Interesting Joyful Attraction (NUBIJA) Project, 2013
- Cochin, India: Ecomobility in one of India's leading smart cities, 2017
- Curitiba, Brazil: A model of transit-oriented planning, 2011
- Freiburg, Germany: Successfully reducing automobile traffic, 2012
- Gävle, Sweden: Smart choices require easy access – the challenge of making mobility management a part of everyday life, 2011
- Hangzhou, China: The world's largest bike sharing program, 2011
- Kaohsiung: Creating a world-class culture of ecomobility, 2017
- La Rochelle, France: A leader in e-mobility policy, 2011
- Leipzig, Germany: Promoting livability through sustainable transportation, 2017
- Lund, Sweden: An ambitious city of ideas and innovation, 2011
- Medellín, Colombia: Improving inclusivity through connectivity and mobility, 2017
- Mexico City, Mexico: Mexico City's Green Plan: Ecomobility in motion, 2013

- Milan, Italy: The Ecopass pollution charge and Area congestion charge - comparing experiences with cordon pricing over time, 2013
- Perugia, Italy: Transit alternatives improving sustainable, accessibility in a historical, hilly town, 2013
- Portland, Oregon, USA: Portland-Milwaukie Light Rail Transit Project: Managing growth sustainably through transit alternatives, 2013
- Portland, USA: A leader in sustainable development in the United States, 2013
- San Francisco, California, USA: Using technology for smarter parking management, 2013
- San Miguel de Allende, Mexico: Considering tourism in sustainable mobility planning, 2017
- Seoul, Republic of Korea: An efficient bus rapid transit integrated with the subway system, 2012
- Stockholm, Sweden: Congestion tax and public transit decrease traffic volume, 2012
- Sydney, Australia: A green, global and connected approach to mobility, 2017
- Vancouver, Canada: Increasing intermodal ecomobile transport methods, 2011
- West Chester, Pennsylvania, USA: On track towards ecomobility in West Chester, 2013

#### Technical Documents

To support cities around the world with technical expertise on particular topics of mobility, experts contributed technical documents on today's crucial urban mobility topics. Some of the papers include:

- Role of dedicated walkways and cycleways
- A call to action on green freight in cities
- Ecomobility in the context of rural-urban connectivity
- Promoting sustainable mobility – key theoretical and practical issues
- Soot-free urban bus fleets
- Sustainable development synergies and co-benefits of low-carbon transport measures
- Transferring sustainable transport and EcoMobility solutions
- Transport and climate change



All technical papers can be downloaded at:

<https://ecomobility.org/resources/technical-documents/>

Montreal, Photo Credit: Beatrice Ching

## 12 Strategies for the Future of Urban Mobility

Planning for transportation system may not produce results overnight. Cities with different topographies, economies, societies and cultures present different opportunities for the local governments to shape the transportation system. Each city's city profile and achievements will be presented according to the *Kaohsiung Strategies for the Future of Urban Mobility*.

### 1. Plan our cities and their mobility together

Spatial and transport planning are intrinsically connected. While transport systems support a city's spatial pattern, the development of the transport network shapes the city in the long-term. A compact, dense, accessible city has many benefits. Single-use zoning not only induces the need to make more trips but also sabotages the public transport network, further reinforcing the exclusion of the less privileged. Locating people near transport modes and activities create good opportunity cost as they are focal points for property development and synergize productive activities. On the micro-level, improving street conditions for walking and cycling builds a "city of short distances," which is why the Transit-Oriented Development (TOD) approach provides better mobility that does not induce more traffic but precisely the opposite.

#### Curitiba, Brazil

#### Connecting Curitiba: City Vehicles Interconnected (CIVI)

Curitiba is internationally renowned as one of the most sustainable and well-planned cities in the world, whereby Curitiba's BRT model has been replicated in more than 150 cities worldwide. Curitiba institutionalized the Transit-Oriented Development (TOD) principle in its mobility plan that requires mixed-use urban developments along the BRT corridors. The city also focused on strengthening the central city with car-free zones and ensured mixed land-use planning. Despite the BRT's success, the city is experiencing the limits of the BRT. Extreme overcrowding has prompted many middle-class commuters to switch to driving, while the metro project was scrapped due to lack of federal funds.

In response to the pushback on public transport, the city adopted a new BRT system plan, called City Vehicle Interconnected, a new generation of BRT that combines the concepts of interconnected city and intelligent mobility with technology. The project includes hybrid and electric buses that will be connected through a total of five corridors (106 kilometers, km) and about 300 stations. Six of these stations will be underground, resembling metro stations but with less depth. All stations will be connected to the fiber optic networks so that passengers have access to wireless internet and cell phone applications with real-time information about bus services, and air conditioning in the spaces, the lack of which has been one of the existing system's main criticisms. When successfully implemented, BRT 2.0 will be an affordable, safe and reliable system, drawing commuters to opt for public transportation again.



#### Curitiba, Brazil

Population: **1,751,907**  
(2010 census)

#### Modal Split (as of 2016)

Walking:	<b>20%</b>
Cycling:	<b>5%</b>
Public transport:	<b>45%</b>
Motorcycle:	<b>5%</b>
Personal car:	<b>22%</b>

Photo credit: WHL Travel



**Freiburg im Breisgau, Germany**

**Population: 227,636** (2017)  
**Modal Split** (as of 2016)

Walking:	<b>29%</b>
Cycling:	<b>34%</b>
Public transport:	<b>16%</b>
Personal car:	<b>21%</b>

**Freiburg im Breisgau, Germany**

**Integration land-use and transport policy for a compact city**

The Green capital of Germany did not start off so pleasant. After the second world war, its development trajectory focused on cars and geographic expansion. When traffic congestion became a pressing issue in the 1960s, the city administration reversed its development policy to public transport-oriented. Contrary to other German cities, Freiburg made a critical decision to maintain and expand the existing tram network, as reflected in the *General Urban Transport Policy 1969*. The essence of this definitive policy is an integrated approach to transport and land use planning. This policy influenced the urban planning approach and prescribed that new developments must be concentrated along public transport corridors.

Building on the success of the 1969 Policy, Freiburg renewed the strategic urban mobility plan, known as the *Transport Development Plan 2008 - 2020 (Verkehrsentwicklungsplan 2008 - 2020)*, with a stronger vision and better coordination with the Land Use Plan 2020. The VEP 2020, crafted by main local and regional stakeholders and residents emphasizes walking, cycling and public transport with an aim to level off or reduce the number of car trips despite increasing mobility. The neighborhood of Vauban was built to be a sustainable model district adopting TOD design principles. Not only are houses built to a low-energy consumption standard, transport in the area is primarily made on foot or on bike due to the layout of the district.

This policy change in the city of Freiburg that lasted over three decades conceived successful results: 60 percent of Freiburg residents do not own a car, boasting the lowest automobile density in Germany. Car trips fell from 32 percent to 21 percent of the modal split in a span of seven years (1999 - 2016). Between 1982 and 2016, the share of bicycle trips doubled from 15 percent to 34 percent and public transport trips rose from 11 percent to 16 percent. Freiburg's success in the integration of land-use and transport has made the city both compact and ecomobile.

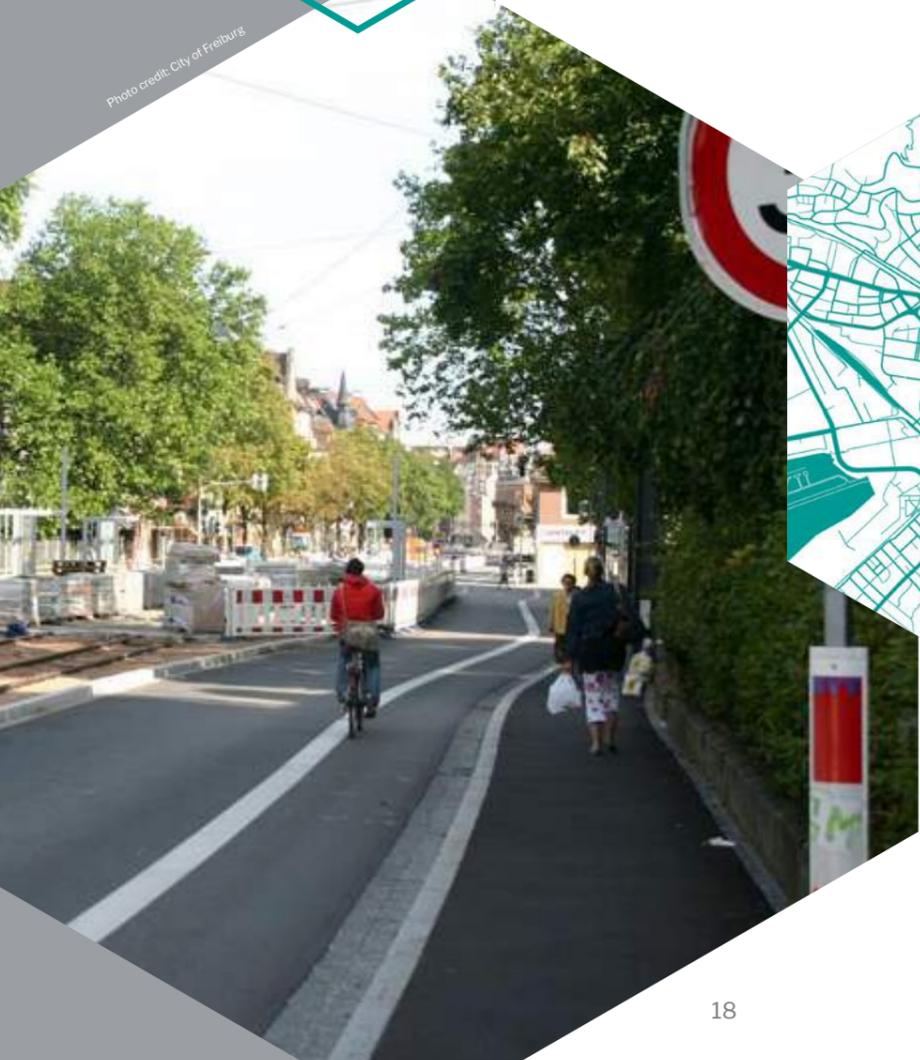


Photo credit: City of Freiburg

Map of the City of Freiburg

**2. Prioritize people over vehicles**

Cities should be built for people and not for cars. Currently, however, city design is often biased towards moving cars faster with extensive road networks. Recognizing that building more roads for cars do not solve the traffic congestion problem, more cities that have invested in active mobility and public transport infrastructure that creates new opportunities for commute and use of public space. The goal is to move more people and goods instead of single-occupancy vehicles. Germany which is a car manufacturing country has set a goal to have a maximum of 150 cars per 1,000 inhabitants with mainly shared cars.

People-oriented mobility is not just about banning cars from the streets but to look at mobility in a more holistic manner that treasures the experience of pedestrians, cyclists, public transport users more than car drivers. For example, instead of building overhead bridges for pedestrians, traffic calming measures are used to slow down cars. The shift towards ecomobility requires a fundamental change in the way cities design their streets to allow for multimodality.

**Belo Horizonte, Brazil**

**A people-oriented transportation system**

Belo Horizonte, the capital city of Brazil's southeastern state of Minas Gerais, links mobility and urban development goals. Sustainable transport is featured in the *2030 Strategic Plan (Plano Estratégico BH2030)*, the city's urban development plan. In 2013, Belo Horizonte became the first city in Brazil to introduce a sustainable urban mobility plan (*Plano de Mobilidade Urbano de Belo Horizonte, Plan-BH*), including elements such as active mobility, public transport, urban logistics, and universal access. Led by the Belo Horizonte Transport and Traffic Company (BHTRANS), various programs and actions are implemented to encourage ecomobility and restrain private car ownership.

**Integrating walking and public transport for inclusivity**

A world-class bus rapid transit system (MOVE) began operation in 2013, stimulated by the MobiCentro project. The goal of this project is to enhance walkability around the Bus Rapid Transit (BRT) corridors and the connecting roadways through low-cost solutions. Through adjustments in the traffic signal programming, pedestrians now have shorter waiting time and longer crossing time. Changes road design, traffic flow and improvement in inter-neighborhood linkages reduced walking distances and increased pedestrian roadways. Also, sidewalks near the intersections have been equipped with alarmed traffic lights to aid safer crossing for the visually impaired and the elderly. Positive impacts such as the following have been observed :

- Air quality improved with the reduction in carbon dioxide emissions (41 percent), nitrous oxide (39 percent), volatile organic compounds (68 percent) and inhalable particles (32 percent)
- Improving operational speed of BHTANS' buses from 9 to 17 kilometer/hour (km/h) and regular municipal buses from 11 to 21km/h through improvements in infrastructure and route-planning
- Faster commute times on public transport contributed to a 73 percent increase in passengers served and an 85 percent increase in the number of bus passengers served (from 84,000 passengers attended per hour to 155,000 passengers served per hour since 2014 to 2017)

Belo Horizonte faces challenges concerning pedestrian safety, so it launched the *Vida no Trânsito (Life in Transit)* project to reduce accidents caused by irresponsible driving and promote a healthy and peaceful culture while in transit. Efforts have reduced traffic accidents by 18 percent. The city is also interested in increasing the use of bicycles, and is expanding the existing cycling path from 89km to 411km by 2020.

\* - Barriga, R (2018). *Fact sheet on Transit Oriented Development*. Retrieved from [https://www.urban-pathways.org/uploads/4/8/9/5/48950199/factsheet\\_up\\_tod.pdf](https://www.urban-pathways.org/uploads/4/8/9/5/48950199/factsheet_up_tod.pdf)



**Belo Horizonte, Brazil**

**Population: 2,500,000** (2018)  
**Modal Split** (as of 2016)

Walking:	<b>34.5%</b>
Cycling:	<b>0.4%</b>
Public transport:	<b>28.1%</b>
Motorcycle:	<b>4%</b>
Personal car:	<b>32.6%</b>



Photo Credit: Belo Horizonte BRT Mariana Gil 2014

## Quelimane, Mozambique

### How bikes create jobs, improve cities and reduce carbon

“Vais para onde? Taxi?” may be the most common phrase one hears in Quelimane, a seaport and industrial city at the east-central part of Mozambique. Quelimane is the first city to introduce bicycle taxis (*taxi-bicicletas*) in Mozambique, and there is a running joke that the city has more bicycles than registered people. Traffic congestion in the city is not caused by cars but bikes, a good problem for the city council to solve. Such concepts of bicycle-taxis are also catching on in Europe.

Bicycles replace buses that do not exist in the city. Taxi-cycling is the way for many young adults to earn their bread and butter for their families. The price of buying bicycles increases gradually as the market is getting bigger. A bicycle which may cost 35 USD in 2014 may cause more than 100 USD today, making it increasingly expensive to be a bicycle taxi driver. With many bicycles on the road, most accidents involve bicycle taxis as many newcomers in the industry do not know the traffic rules. Despite this, the city does not perceive bicycles as a nuisance but works towards enforcing the traffic regulations and improving road safety to benefit the cyclists. All primary school students are taught traffic rules and safe walking practice to enhance awareness. The municipal authorities provide training to bicycle-taxi drivers but are insufficient because many join the industry daily.

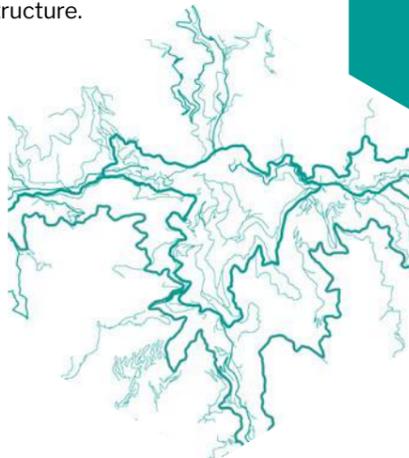
Given how dependent residents in Quelimane and the rest of Africa depend on walking and cycling, the urgency is higher to provide pedestrian and cycling infrastructure to maintain this modal split. Quelimane is also working towards establishing cycling paths, cycling highways and shared bicycle program to improve cycling conditions. This should be the norm for all types of new projects or developments, as sustainable and efficient mobility is a pre-condition for economic growth and personal wellbeing.

## Shimla, India

### Promoting active mobility in a hilly area

The rapidly urbanizing hillside town of Shimla in Northern India is the capital of Himachal Pradesh, perched in the southwestern ranges of the Himalayas. Shimla is part of India's Smart City Program and strives to be a livable, sustainable and resilient city. The Shimla Smart City Mission was prepared based on the priorities identified during the public consultation progress. The plan focuses on transport and pedestrian mobility and also on creating open recreational spaces.

The city passed a *Comprehensive Mobility Plan (CMP) 2031*, which steers the actions and targets of the city's urban mobility towards an integrated and connected approach to sustainable urban mobility given the hilly structure of the town. The CMP aims to promote ecomobility, such as cycling and use of public transport. The city is working on developing a bike sharing system with three routes and six stations. It is also working to improve the bus service with regards to both quantity and quality, and to improve local freight infrastructure.



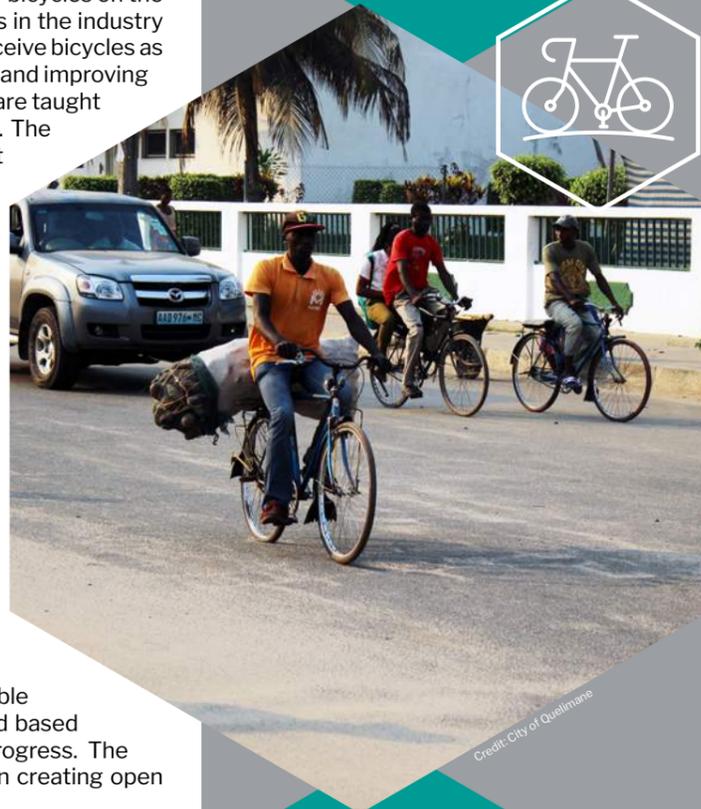
\* Marcelino Mueia (2015, June 30). *Quelimane wants more cycling taxis*. Retrieved from <https://www.dw.com/pt-002/quelimane-quer-ciclo-taxis-com-mais-seguran%C3%A7a-18551852>

## Quelimane, Mozambique

Population: **349,842**  
(2017 census)

### Modal Split (as of 2016)

Walking:	<b>82%</b>
Cycling:	<b>9%</b>
Public transport:	<b>4%</b>
Motorcycle:	<b>3%</b>
Taxi:	<b>0.9%</b>
Personal car:	<b>1%</b>



Credit: City of Quelimane

## Shimla, India

Population: **169,578**  
(2015 census)

### Modal Split (as of 2011)

Walking:	<b>42%</b>
Cycling:	<b>1%</b>
Public transport:	<b>49%</b>
Taxi:	<b>1%</b>
Personal car:	<b>7%</b>

Map of City of Shimla

Sustainable Mobility Week 2018 in Buenos Aires (Credit: City of Buenos Aires)



## 3. Support the shared and efficient use of vehicles, lanes, curbs, and land

What makes a city great is its public space. They are settings for the community to engage in social and economic activities and to celebrate diversity. They give identity to an urban area. Instead of wasting precious public space for cars by widening roads and car parks, local governments need to reconsider how places can benefit people while balancing the interests of stakeholders. Providing spaces for people cannot be a top-down approach but requires significant support from the local community in creative placemaking. For example, people of color in the USA are disproportionately killed while walking on streets that are not designed in a safe way. Such structural prejudice is in part due to the lack of representation by the people of color and the top-down approach to transportation planning that has rarely meaningfully engaged the public. Thankfully, there are many grassroots efforts around the world to change this through creative placemaking or even closing down parking lot for fun community activities.

## Buenos Aires, Argentina

### Transforming public space

Buenos Aires, the metropolitan capital of Argentina, won the prestigious Sustainable Transportation Award 2014 for giving the *Avenida 9 de Julio*, the widest avenue in the world, a massive makeover. The city replaced more than 20 lanes of car traffic with bus-only lanes for a high-quality BRT system with 17 stations, accommodating 11 bus lines for 200,000 passengers each day. Concurrent with reducing car lanes, the city also enhanced the experience of a pedestrian or cyclist by creating comfortable and continuous walking paths and public space. Furthermore, it expanded the cycling network to 221km and is doubling the ecobici bike-sharing system to 4,000 bicycles and 400 stations.

### Buenos Aires walks

Buenos Aires announced the “*Buenos Aires Camina Plan*” in October 2018, which is the city's first walkability plan that seeks to incorporate more public space designed for pedestrians. To consolidate all the efforts that Buenos Aires have been doing in the realm of mobility and public transportation, the city intended to integrate all initiatives under the umbrella of a basic walking strategy. This is because walking is an expression of social integration, freedom and autonomy that brings economic, environmental, individual and public health benefits. There are three fundamental goals in this plan, with the aim of decentralizing walking from the most to the least populated area. They are to:

- Improve walkability and the walking conditions of pedestrians by installing connected walking routes and paths in neighborhoods that are lacking in walking infrastructure;
- Develop guidelines for a people-oriented city;
- Design and implement three pedestrian corridors on the north and south of the city that connects green spaces, public buildings, and transshipment centers.

In large metropolises, public green spaces and parks are often spread sporadically in between buildings, busy streets and shopping centers. To improve the connectivity between green areas and the city, Buenos Aires aims to expand the physical limits of the green spaces and public parks of the city and also incorporate the surrounding streets to enhance the experience of pedestrians. All walking efforts are also supported by the Road Safety Plan to reduce road accident fatalities by 30 percent by 2019.

\* Transport for America. (2017). *Arts, culture and transportation: A Creative Placemaking Field Scan*.

### Mainstreaming gender equality in transport planning

Women encounter more challenges in mobility, and they have different travel patterns from men. Various studies conducted in Buenos Aires showed that women tend to use public transport more than men but feel more insecure<sup>\*\*</sup>. In response, the city drafted the first Gender and Mobility Plan with the primary aim to mainstream the gender perspective within the design and implementation of the city's transport and public space policies. It details four central axes of actions from different angles:



- Security in public transport and public space
- The inclusion of women workforce in the transportation sector
- Data collection and analysis disaggregated by gender
- Awareness creation and cultural change

The city hopes that women's perspectives will be incorporated in every transport project in coordination with the Secretariat of Transport.

### Making mobility fun for families

The city organizes Sustainable Mobility Week every year to encourage cycling and teaches road safety while using a bicycle, particularly for children. Various events including music events and bike tours for families are organized, impacting 1 million people and the way they think about mobility. In 2012, the city organized PARK(ing) Day by transforming metered parking spaces into temporary public areas for people to exercise and socialize.



Map of City of Buenos Aires, Argentina.

<sup>\*\*</sup> Heather Allen. (2018). *Approaches for Gender Responsive Urban Mobility*.

### Suwon, South Korea

Population: **1,170,878**  
(2013 census)

#### Modal Split (as of 2016)

Public transport:	<b>45%</b>
Taxi:	<b>8%</b>
Personal car:	<b>47%</b>



Photo Credit: Suwon South Korea, Source ICFE



### Suwon, South Korea

#### The social and economic benefits of reclaiming public space

Suwon, a major industrial and cultural hub neighboring the capital city of Seoul, is well-known for its UNESCO Cultural Heritage Hwaseong Fortress. This year marks the fifth anniversary of the first EcoMobility World Festival ever organized. Suwon's primary motivation in hosting the Festival was to rejuvenate the deteriorating conditions of the old city center through ecomobility. When the idea of one-month of no cars was communicated to the public, the city was faced with protests by opposition. Through a series of engagements, the Citizen's Steering Committee for EcoMobility was formed. Members of this committee eventually became the mouthpiece for the city, advocating for why ecomobility should be implemented throughout the city. Now, they are the core mobilizers of all the annual car-free days.

Before the Festival, the city invested heavily in the "Urban Regeneration Project" to create pedestrian-only streets, gardens and public space. This project beautified the façades of buildings used art to drive creative placemaking. Because of the noticeable change, visitors to the otherwise neglected area almost doubled. Pedestrian-only streets attracted more people to walk and shop at the local stores, generating 90 million USD in commerce, roughly equating to 1,500 jobs created throughout the 2-year preparation.

The 2013 Festival inspired more changes throughout the city. More car-free streets were demarcated in 20 districts by 2018 and overseen by the EcoMobility Bureau, which is another legacy of the Festival. This Bureau works to enhance ecomobility in the city and organizing yearly car-free days. Since the Festival, the city strengthened the culture of public participation through more town hall meetings where the residents could provide feedback to the administration's policies and initiatives.

In celebration of the fifth anniversary, the city organized the 5th Anniversary of the EcoMobility Festival with Haeggung-dong residents. The event was to celebrate the progress in ecomobility for the past five years, to appreciate residents for participating at the Festival 2013 and to highlight the importance of ecomobility in the future. About 300 residents, visitors, youths and public officers participated in the "Together, EcoMobilier?" parade and a ceremony officiated by the mayor. A Sustainable EcoMobility Village Forum was organized with civil society and residents to reflect how Suwon can further reduce dependency on cars. The celebration of the 5th Anniversary of the Festival shows how committed Suwon is to ecomobility.

\* A phrase created by Suwon to denote people supportive of EcoMobility

## Mexico City, Mexico

### The benefits and dangers of shared mobility

The total revenue in the shared mobility sector stands at 239 million USD in Mexico in 2018. Mexico City saw a surge in the number of shared mobility options this year, ranging from kick e-scooters (Bird, Grin, Lime), bicycles (MoBike) to ride-hailing services (DiDi Chuxing). City government recently enabled contactless payments through bank cards and e-payments. The public bike-share system, EcoBici, is the fifth-largest in the world, with 6,800 bicycles, 480 stations, and more than 100,000 users. More than 40 million trips were taken, and it was reported that EcoBici had reduced 8 percent of taxi use and 5 percent of private car use. These bikes averaged at 3km especially for getting around the city center, closing the last-mile gap. Bike lanes have increased throughout the city to 170km cycling lanes, two large bike hubs, and 3,000 bike racks. With the entry of Mobike, the company plans to implement 50 bike parking zones in one of the city area, Miguel Hidalgo. All these efforts increased bicycle trips by 35 percent in the past five years.

Ride-hailing is another major industry that shapes Mexico's modal split. While there are other ridesharing platforms in Mexico City, Uber remains the most prominent player since it entered the city in 2013. Its market share will likely continue to grow, as Uber planned to have 500,000 active drivers by the end of 2018. While the ridesharing and taxi industry had a rough beginning, it harmonized over the years due to the multi-stakeholder negotiations and regulations that try to differentiate the taxi and ride-sharing markets by prohibiting cash payments and by setting threshold car prices for shared cars\*. Nonetheless, the incoming mayor of Mexico City announced that review of current regulations to the taxi and ride-hailing industry is undergoing to avoid "unfair competition" between the two sectors. The incoming mayor also announced a reversal of the decision to replace the taxi meters in traditional taxis with tablets, a step to modernize licensed taxis.

According to a 2018 study\*\*, the explosive growth of ride-hailing services like Uber has negatively impacted public transportation in American cities. Mexico City's 2014 Mobility Law ensures a car-lite planning approach so that ride-sharing platforms do not compete with public transit and increase congestion. The entry of various micro-mobility, bike-sharing, and ride-hailing companies represent exciting opportunities for Mexico City to enhance mobility, sustainability and equality.

\* Eisenmeier, S. (2018). *Ridesharing platforms in developing countries: effects and implications in Mexico City*. Pathways for Prosperity Commissions Background Paper Series: no. 3 Oxford, United Kingdom

\*\* Schaller, B. (2018). *The new automobility: Lyft, Uber and the future of American cities*. Brooklyn, United States

## Mexico City, Mexico

Population: **8,851,000**  
(2010 census)

### Modal Split (as of 2016)

Walking:	<b>0.8%</b>
Cycling:	<b>0.8%</b>
Public transport:	<b>71.3%</b>
Motorcycle:	<b>0.2%</b>
Personal car:	<b>21.5%</b>



The CDMX metropolitan (Credit: 3mb.o)



## 4. Promote equity

Mobility is an enabler of social and economic advancement by gaining access to social and economic opportunities. However, access to prospects can be dependent on social status. Traditional urban development (e.g., car-centric planning, single-use zoning) encourages carbon-intensive and social-exclusion growth, making car owners in almost all parts of the world more independent in their mobility than non-car owners.

Cities approach equity differently but it is generally achieved through subsidies (subsidizing public transport in **Buenos Aires**), public transport cards (**Belo Horizonte's** BHBUS Inclusion card), and the upgrading of vehicles (**Kaohsiung's** wheelchair-accessible taxis and bus fleet). **Portland**, USA's approach is particularly interesting. The Portland Bureau of Transportation (PBOT) initiated a Five-Year Racial Equity Plan with a goal to provide equitable city services to all residents and end disparity at the city government level. Also, Safe Routes to School and other programs utilize PBOT's Equity Matrix, a tool that census map tracts to identify communities with higher populations of people of color, people with low incomes and people with limited English proficiency.

## Bogota, Colombia

Population: **8,181,047**  
(2018 estimate)

### Modal Split (as of 2015)

Walking:	<b>31.12%</b>
Cycling:	<b>4.28%</b>
Public transport:	<b>38.73%</b>
Taxi:	<b>4.6%</b>
Motorcycle:	<b>4.79%</b>
Personal car:	<b>7%</b>
Others:	<b>5.1%</b>

### Equitable access as the core value of transport projects

Bogotá, the capital of Colombia, is known for its transformation from a car-centered to a people-centered transportation system. The world-class BRT system is one of the most heavily used in the world with 2.4 million passengers daily, mobilizing 69 percent of the population with the 112km long route and 17,335 buses. Aside from the BRT, the city launched a new cable car system (TransMiCable) in December 2018, serving the neighborhoods in the southern part of the metropolitan together with the TransMilenio bus system. It is envisaged to benefit 750,000 residents that also have enough space for bicycles and wheelchairs.

On top of that, the first metro in the city, Metro de Bogotá, commenced construction in August 2018 and will be completed by 2024. This 4.4 billion USD project comprises 24km of line serving 15 stations and 23 trains with capacity for 1,800 passengers. A new voluntary Bicycle Registration System commenced in November 2018 with the goal of linking all bicycles to their owners in hope to reduce thefts and facilitate stolen bike's return to their owners.

### Enhancing women's safety

Around 800,000 women use Bogotá's TransMilenio bus system daily, but a survey indicated that 64 percent of the interviewed women had been victims of sexual harassment in public transport, while 80 percent of these women reported that such acts happened while *en route* with TransMilenio, stressing the inequitable experience faced by women in public transport. While many efforts have gone into improving women's safety such as women-only seats, the impacts are limited. Therefore, the city is inspired to adopt technology to map out security in Bogotá with the SafetiPin app, an innovative real-time mapping application to collect, analyze and disseminate information to make public spaces safer for women.

Under this initiative, 15,547km of the city will be audited according to seven variables: (1) quality and quantity of lighting, (2) openness/blind spots; (3) visibility; (4) pedestrian density; (5) security staff presence availability of pathways; (6) public transport and; (7) presence of pedestrians based on gender. The goal of this is to create the first-ever safety index of the city at night. This project is funded by the Transformative Urban Mobility Initiative (TUMI) of which ICLEI is one of the founding partners as the winner of the Global Urban Mobility Challenge 2018.

Photo credit: TransMiCable



## Medellin, Colombia

Population: **2,508,000**  
(2017 census)

### Modal Split (as of 2011)

Walking:	<b>27%</b>
Cycling:	<b>1%</b>
Public transport:	<b>34%</b>
Taxi:	<b>6%</b>
Motorcycle:	<b>12%</b>
Personal car:	<b>13%</b>

## Medellin, Colombia

### Social innovation through sustainable urban mobility

Once notoriously known as the world's most dangerous place Medellín, the second largest city in Colombia, transformed itself to one of the most innovative and sustainable cities in the world in just 20 years. What was the key to such a radical urban and social transformation that redefined the city? Public transport.

The construction of the metro and cable car became a defining moment for the city as it integrated the poorest and most violent hillside neighborhoods into the city center in the valley below. The public transportation system has since expanded over the years to include trams, outdoor escalators, BRT, and the new bike-share system, EnCicla. It is also complemented by the new transportation project (Transporte Público de Medellín, TPM) whereby urban buses are provided to connect the hillside residents to the main public transportation stations. Under this initiative, several changes have been completed:

- Remodeled 506 public buses with cleaner technologies, reducing emissions by 4,066 tons of CO<sub>2</sub> and 5.4 tons of PM<sub>2.5</sub>
- Improved 232 buses to enhance comfort for people with reduced mobility
- Redesigned 887 buses with a new image so that commuters can better identify the coaches they should use

### Improving road safety and air quality through tactical urbanism and vehicle restriction

Medellin's Human Mobility Management serves to promote clean transport alternatives and create a culture that supports ecomobility. This public policy places pedestrians at the top of the mobility pyramid and classifies tactical urbanism as the perfect strategy for a safe mobility system. Tactical urbanism is a general term used to describe low-cost and brief changes to the built environment in cities. This tactical urbanism project focused on locations with high vehicle traffic and with various interventions costing between 1,700 and 17,000 USD. These interventions took between one and three months to implement, including signaling works, reducing road widths, installing furniture, planting trees, drawing artistic works on the ground, and reorganizing traffic lights to give priority to pedestrians. Quick interventions like this generated easy wins. The mortality of pedestrians and motorcyclists reduced drastically. For example, there were no accidents recorded in the Laureles neighborhood of the zone of Consolata in 2018, where generally at least 11 road accidents occur monthly.

The Mayor's Office of Medellín and Metropolitan Area of the Aburrá Valley (AMVA) share the responsibility of improving the air quality of the city through an integrated air quality management plan (PIGECA 2017 - 2030). One of the achievements is the Operational Plan for Atmospheric Contamination Episodes which was adopted in October 2018. It mandated vehicle restriction according to the numbers on license plates, with the goal to reduce the concentration of PM<sub>2.5</sub> and protect the health of residents. Furthermore, all public and private companies with more than 200 employees must formulate a Sustainable Mobility Plan taking account strategies such as work at home, car sharing/pooling, flexible schedule and establish quantitative goals to reduce fuel consumption and some trips. As a result, universities and companies are creating their carpooling systems, hoping to reduce 2,000 vehicles each day.

### A success urban transformation story

Medellin's social innovation through sustainable urban mobility is based on collaboration between the business sectors, universities, communities and the municipal for the construction of long-term public policies. While equity was the catalyst of the city's journey towards urban transformation, the city now focuses on electrifying public transport, including 60 BRT bus fleets and 500 taxis by 2019. It also aims to have 10 percent of the city's vehicles to run on renewable energy by 2030. Medellín's story of urban transformation proves that transportation is integral for even economic development and social equity.

Photo Credit: USA-Release/Getty Images

## 5. Support fair user fees

Economic instruments are one of the best ways to influence travel behavior and mode choice. A transportation system accrues direct internal costs that stem from the provision and use of transport infrastructure such as construction and maintenance, as well as indirect costs accumulated from accidents, pollution, etc. Subsidies are generally used to encourage public transport use or the switch to cleaner vehicles, while taxation, auctions and bidding schemes can be used to restrict the provision of parking spaces or quantity of cars. For example, **Mexico City** announced in 2018 its plans to invest more than one million USD to increase charging stations and provide 20 percent discount on road tolls for EVs.

Taxes on vehicle and fuel make good sense for cities. It generates additional revenue to finance transport infrastructure and provide incentives to use public transport. In **Quito**, for example, Ecuador used parking charges in the city center helped to fundraise construction of BRT. The experiences of London and Singapore have shown that congestion charging can be a very effective means of mobility demand management. Congestion charging and well-integrated public transport in London reduced the number of car trips by nine percent over the past decade.

## Boulder, USA

### Access management and parking strategy

Boulder maintains comprehensive policy and management strategies to provide multi-modal transportation systems with very detailed performance measurement and reporting to the general public. Parking options influence an individual's mobility choice that is often underestimated. Ample provision of parking spaces can undermine the city's efforts to encourage public transport usage, and it wastes valuable open space. Furthermore, low parking rates do not reflect the real cost of parking space.

To support its community's social, economic and environmental goals, Boulder emphasizes the creation of customized solutions that meet access goals. In 2014, the Access and Management and Parking Strategy (AMPS) was formulated by the interdepartmental AMPS Steering Committee that included representation from Community Vitality, Transportation, Planning and Communications. It is an approach to enhance access to existing districts through six focus areas, including on-and off-street parking and parking pricing.

### Parking Cash Out

Downtown Boulder has served as a testbed for parking and access management programs and technologies over the past decade. One example is the "Parking Cash Out" pilot with downtown businesses. Parking Cash Out is a financial incentive offered to employees to encourage the use of commute modes other than driving alone, which both reduces parking demand and helps ensure that company benefits are distributed equitably. Commuters can choose to either keep their employer-subsidized parking spot or forgo parking and receive the approximate cash equivalent of the cost of parking by using an alternative transportation option. One of the Boulder-based company subscribed to this system and also offered an *EcoPass* which allows unlimited access to all public transport. 33 percent of the workforce participated in this program, and the company estimated that the net savings amount to approximately 17,000 USD/month. Implementing this reportedly did not cost much to the city, and it resulted in lower parking demand and single-occupant vehicle.

### Data-driven management

Boulder also used data-driven parking and access



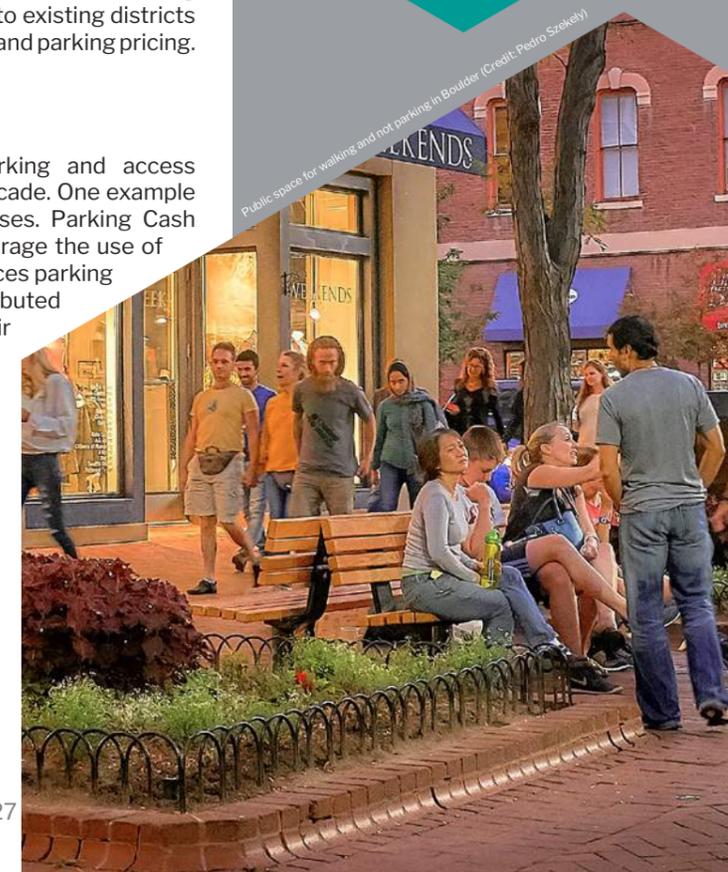
## Boulder, USA

Population: **107,125**  
(2017 estimate)

### Modal Split (as of 2011)

Walking:	<b>20%</b>
Cycling:	<b>19%</b>
Public transport:	<b>5%</b>
Personal car:	<b>36%</b>

Public space for walking and not parking in Boulder (Credit: Pedro Szekely)





management decisions by collaborating with Smarking, a data analytics company which connects on- and off-street parking data points from different sources into one comprehensive dashboard. A system to collect data points is installed in all city-owned parking garages. Through real-time data collection, the city is working to use demand-based pricing to address peak demands.

In addition, Boulder is considering parking pricing as a tool to redistribute parking demand in Downtown Boulder. An extensive community engagement process is in the process to review, and development of recommendations on parking policy, with a particular focus on the role of pricing, plays in management parking to create community access.

Boulder shows an exciting example of connecting parking and access management. The strategy is to work with employers to restrict the need for parking and encouraging walking, cycling, the use of public transport and car-pooling.

### Kaohsiung

#### Promoting electric mobility in Kaohsiung with subsidies

Kaohsiung, the EcoMobility Alliance Chair 2016 – 2018 and the host of EcoMobility World Festival 2017, is the pioneer city of electric mobility. Scooters and motorcycles are the most common travel mode in the city, making this one of the crucial topics for the city. To promote electric vehicles, the city employs a subsidy approach that includes benefits such as:

- E-scooters and e-cars do not have to pay fuel tax
- Direct subsidy of new purchases of e-scooters or e-bicycles. For the older motorized scooters, grants can cover up to one-third of the price of a new e-scooter
- Companies receive subsidies to purchase e-buses.

As a result, more than 150,000 two-stroke motorcycles were removed in 2016 (84,000) and 2017 (80,000), while 6,020 new e-scooters were purchased, making it the first in Chinese Taipei. This translates to the reduction of 1,642 metric tons CO<sub>2</sub> and 102 metric tons of PM<sub>2.5</sub>.

Push and pull factors are needed to change user demand to favor more sustainable modes. As Kaohsiung-ites are very accustomed to using private motorcycles, the city adopts policies that encourage commuters to give up their private motorcycles while also promoting public transport. From 2020 onwards, the city will not subsidize the exchange of two-stroke motorcycles and will also be ban such vehicles road.

As of 2018 the city maintains 97 electric buses, representing 9.2 percent of the total city buses. By 2030, all public buses in the city will be electrified.

## 6. Work towards integration and seamless connectivity

Modal integration is a significant component of an urban mobility strategy. It is enabled by the coordination of transport infrastructure, services, facilities and spatial configuration between at least two different transport modes. Network, fare, information and institutional integration are necessary to facilitate intermodal transfer between different transport modes. For example, if a high capacity BRT station is constructed, the catchment area needs to have good feeder services or infrastructure to allow walking for shorter trips or cycling for longer distances, closing the first- and last- mile gaps.

Many cities recognize the need to integrate between different modes. In September 2018, **Kaohsiung** introduced the ‘*MenGo*’ application, a mobility-as-a-service platform for users to book public transportation passes that allow passengers to use the subway, bus, light rail transit (LRT), ferry, shared bike, and taxi. Passengers who travel with *MenGo* card can enjoy cheaper transit fare.

### Leipzig, Germany

#### Integrated and seamless public transportation

Leipzig, located 160km away from Berlin, is a hub of trade and economic activity. Due to its physical location, it is a major regional hub that connects to major cities in Germany and neighboring countries. With forward-looking policies, Leipzig is a leader in sustainable mobility in Germany. Leipzig works towards providing integrated and seamless mobility to ease the convenience of commuters and encourage people to travel in an ecomobile manner instead of using a car.

Leipzig Central Station is Germany’s largest railway station measured by floor area, with a multi-level concourse and a large shopping center. It functions as a major regional hub for long distance train connections and connects many other transport modes such as the bus, tram, S-Bahn (light rail), and both bike and car-sharing stations. This allows for a smooth transition from one mode to another. The linchpin of the S-Bahn network is the Leipzig City Tunnel, an underground railway line connecting Leipzig with the region and the city of Halle. The ten lines serve 1.2 million people in the Leipzig/Halle metropolitan area.

The next critical component is the 215km extensive tram network that is the third largest in Germany, with 13 routes traveled by 295 trams through 518 stations. Since 1 January 2018, the tram network runs entirely on renewable energy, also a first for Germany. Tram stations are connected to other forms of local public transportation, including the 46 bus routes covering a total of 749km, allowing the network to serve the entire area of the city.

#### Integrated local and regional partners

There are two main actors responsible for the provision of public transportation in Leipzig. The first is the municipal transit operator, the Leipziger Verkehrsbetriebe (LVB), which is responsible for the bus and tram networks and the overall planning and management of public transportation in Leipzig. LVB takes over 148 million passengers yearly. The second is the Mitteldeutscher Verkehrsverbund (MDV) or Central German Transit Alliance who coordinates the regional transportation, namely the S-Bahn. LVB is part of this Alliance and works closely with it to provide integrated ticketing and timetable services across the region. In November 2018, the LVB and the Federal Ministry of Transport and Digital Infrastructure commenced a 4.43 million Euro project to develop a Mobility Factory. The aim is to create digital opportunities and solutions to meet transport needs in the future.

#### Integrated services

Real-time information of the public transportation services can also be found on the *easyGO*, *Leipzig mobil*, and *DB* smart applications. These applications



### Leipzig, Germany

Population: **585,000**  
(2017 census)

#### Modal Split (as of 2015)

Walking:	<b>25.4%</b>
Cycling:	<b>17.3%</b>
Public transport:	<b>17.5%</b>
Personal car (driver):	<b>30.5%</b>
Personal car (passenger):	<b>9.3%</b>



provide information on bus, trams, trains, shared cars, shared bicycles and taxis so that commuters can plan and pay for their journey easily. To close the first- and last-mile gap, Leipzig has been planned as a compact city that encouraged walking and biking. For example, trams and tram stops are designed to be friendly for people with reduced mobility. Greening of tram tracks is done to beautify them and increase green space.

Leipzig's commitment to sustainable urban development won it the title "European City of the Year 2019" by the London-based Academy of Urbanism.

## 7. Lead the transition towards a zero emission and renewable energy transport future

Progress in adopting renewable energy in the transport sector is sluggish. According to the *Renewables 2018 Global Status Report*, a vast majority of global energy needs (92 percent) in the transport sector is still met by oil, with small proportions met by biofuels (2.8 percent) and renewable electricity (0.3 percent). Electrifying the transport sector creates enormous market opportunities for renewable energy, provided that appropriate policy and market are formulated.

Many cities are on the forefront to accelerate the uptake of electric vehicles. **Portland's** Climate Action Plan (CAP) is a strategy to put Portland and Multnomah County on a path to achieve a 40 percent reduction in carbon emissions by 2015 and an 80 percent reduction by 2030 (compared to 1990 levels). Meanwhile, electrification of public transport is increasing, as demonstrated by how Leipzig's tram system and electric vehicles run entirely on renewable energy. **Belo Horizonte, Buenos Aires, Boulder, and Medellin** are electrifying their public bus fleets.

### Changwon, Republic of Korea

#### Enhancing air quality through Zero Emission Vehicle (ZEV)

Changwon, a city in the southeast coast of South Korea, faces an annual haze problem which is exacerbated by vehicle emissions. The Ministry of Environment reports that Changwon has the greatest number of both electric vehicles in the country, with 989 electric cars, 178 fuel-cell cars, and five electric buses as of 2018. To encourage this growth, the city is investing significantly in deploying EV and infrastructure.

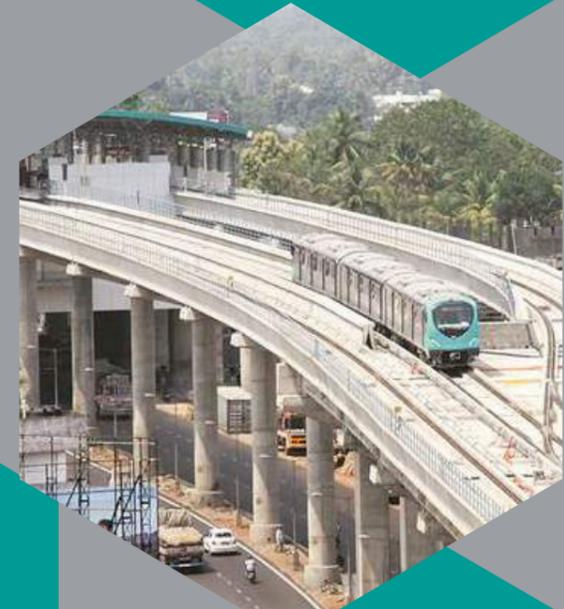
The city is advancing its efforts by adopting the *Zero Emission Vehicle (ZEV) Action Plan 2018–2022*, a strategy to put Changwon on a path to achieve a reduction in carbon emission by 2030. The goal of this is to have 10,000 ZEVs by 2022, and so the city has worked to incorporate EVs and other low/no emission vehicles into the transportation system. To encourage the uptake of ZEVs, the city is pursuing initiatives such as providing support to purchase ZEVs after scrapping old vehicles and private ZEV parking spaces and toll discounts.

A substantial component of the ZEV Plan is to work with the automotive manufacturers. While the local government provides a subsidy for ZEVs, charging facilities and better services, manufacturers are required to have high-quality service and technology to attract more customers. As of 2017, 6.5 million USD was invested to deploy EVs, fuel-cell EVs (FCEVs), and 50 quick-charging stations in the city. In 2018, two FCEV charging stations were established. The impacts can already be seen with reduction of 1,357 tons of CO<sub>2</sub> emission and fuel cost savings of 860,000 USD.

To create a livable city, Changwon complemented the ZEV Plan with other strategies, including introducing the urban railway tram by 2025. The city maintains excellent cycling facilities: 603 km of cycling path, 16,735 bike parking spots spread across 1,286 locations and 151 public bike pumps. The NUBIJA bike sharing program with 3,932 bicycles is used by 15,000 users daily, reducing emissions by 5,488 tons of CO<sub>2</sub> (2016). In the future, the city is planning to introduce a light rail tram by 2025 to connecting tourism and business hotspots.



Photo Credit - Changwon City



The newly established Kochi Metro (Credit: Metro Rail News)



### Kochi, India

#### Decarbonizing Kochi's transportation sector

Kochi, the capital of Kerala State, is located on the southwestern coast of India. As with many Indian cities, traffic congestion is chronic in Kochi, with many numerous rickshaws serving as the intermediate public transport (IPT). The transport sector in Kochi accounts for 20.2 percent of the PM2.5 concentration in the city. Auto-rickshaws are the most noteworthy contributor to the city's transport-related emissions at 93 tons per day. This mode is also responsible for emitting significant amounts of harmful pollutants per day, including carbon monoxide (3.1 million grams, g), Particulate Matter 2.5 (148,000 g) and nitrous oxide (384,000 g)\*.

The Indian government declared intentions to achieve 100 percent electrification of cars by 2030. Following the move, the Kerala State Government announced a preliminary draft of the policy to promote "eco-friendly electric vehicles" in January 2018. The plan aims to electrify public buses and auto-rickshaws. In India, other cities have been electrifying auto-rickshaws since 2012. Ola, the Indian ride-sharing app, announced that it will introduce 10,000 e-rickshaws in three Indian cities although Kochi is not yet included. Shortly, the Kerala state government plans to issue taxi-permits to only e-rickshaws in hopes of reducing the number of conventional three-wheelers.

The Kochi Metro Rail Limited (KMRL) is responsible for providing a mass public transportation system in the city, including the newly opened Kochi Metro. Together with the state government, Kochi began the trial run of the e-buses in the metropolitan area. KMRL also initiated projects to achieve last-mile connectivity with e-rickshaws, and to enhance safe access by focusing on active mobility projects.

To create a unified and integrated transport network, an Urban Metropolitan Transport Authority (UMTA) has been approved. The UMTA is the umbrella body that will coordinate the existing transport authorities and manage public transport. Kochi hopes that this will streamline operations and make public transportation more convenient and attractive for commuters. Kochi is an exemplary example of how a highly congested city shifts towards a greener and people-oriented mobility.

### Quito, Ecuador

#### Building resilience through sustainable mobility

Quito, the capital of Ecuador, is the second-highest capital city in the world at an altitude of 2,850m, where it is surrounded by volcanoes and deep valleys. The city's altitude can cause much structural vulnerability, making resilience one of the most important agendas for the city. Quito was selected to be part of the 100 Resilient Cities (100RC) initiative, which supports cities around the world to build urban resilience.

Building urban resilience means developing the capacity to prepare for and to adapt to change so that the city can continue functioning effectively and efficiently. Mobility exerts chronic stress on the city's infrastructure, which is reflected in the lackluster quality of the service, poor accessibility, lack of public space and poor air quality. Transportation is the most carbon-intensive sector in the city, representing 56 percent of the carbon footprint of the city, translating to almost 3 million tons per year. For this reason, Quito is investing in mobility alternatives that contribute to reducing carbon footprint while also helping the city cope with natural hazards. Creating an integrated and compact city is essential to reduce carbon concentrations.

The first Quito metro line is planned to operate in 2019. The 22.7km system will form the backbone of the public transportation system and enable integration with existing mobility systems. The system is also complemented by promoting active mobility in the city. To date, 45km of cycling lanes have been completed. To maximize the benefits of the public transportation system, the TOD planning approach improves access to residential, commercial and recreational areas. Such physical improvements in transport and urban planning are potential catalysts that can generate transformative benefits, helping to make communities more resilient.

\* Rao Ghorpade A., et al. (2014). SOLUTIONS Pilot Cities Feasibility Studies - Kochi.

## 8. Support that autonomous vehicles (AVs) in urban areas should be operated only in shared fleets

Producers of AVs are developing the technology faster than local governments can react to, plan for, and regulate as appropriate. Given their potential to become market-ready, AVs could dramatically impact travel and urban form of our cities – under current and future conditions. If the traditional car-centric planning approach continues, traffic congestion problems will persist or even worsen. AVs can only deliver genuine benefit to cities if their emergence happens alongside other transformation in our cities. AVs should contribute to the broader aims of the cities rather than becoming the objective themselves. The general public wants to know how AVs will be embedded alongside non-automated cars, pedestrians, cyclists and public transportations. When possible, cities need to encourage a future where transportation is shared, energy efficient, connected and supportive of public wellbeing and health. To reap genuine benefits, cities need to begin working on identifying desired outcomes and then guide urban action accordingly.

### Portland, USA

#### Leading by example: Portland's holistic approach to sustainable mobility

Portland, a harbor city, is an excellent example of how a city could proactively approach AVs by focusing on the fundamentals of sustainable mobility and livable city planning. Many exciting things happened in 2018. Portland maintains the *Comprehensive Plan 2035* and the *Transportation System Plan 2035* that took effect in May 2018. Both plans work together to guide the transportation policies and investments in Portland to achieve the Vision Zero goal (i.e. zero fatalities), help transit and freight vehicles move reliably and affordably, and to create great places for its residents.

#### Portland's transportation hierarchy for moving people

Portland focuses on moving people in the most ecomobile manner, i.e. prioritizing walking, cycling, transit and use of shared vehicles. If individual transport is needed, then ZEVs are preferred. This transportation hierarchy forms the basis of all transport development in Portland regardless of new technologies like AVs. The goal is to move people in the most efficient, effective and safe manner. One of the biggest pushes in 2018 has been the update to the *Pedestrian Master Plan 1998* (PedPDX), which is slated to complete in early 2019. PedPDX will include a prioritization framework that will be updated regularly to identify projects for funding, a toolbox of action that will enhance the pedestrian experience and performance measurements to track progress. In addition, Portland is conducting a citywide Americans with Disabilities Act (ADA) Transition Plan, which includes strategies for barrier removal and reviews of rules and regulations.

Portland will be releasing the *Portland Protected Bikeway Design Guide* to help planners to ensure that protected bikeways have a standard design that is easily



### Portland, USA

**Population: 647,805**  
(2017 census)

#### Modal Split (as of 2015)

Walking:	<b>5.7%</b>
Cycling:	<b>6.3%</b>
Public transport:	<b>12.6%</b>
Motorcycle & Taxi:	<b>1.4%</b>
Personal car:	<b>56.7%</b>

Credit: Portland City

understandable by people biking, walking, and driving. In 2018 alone, Portland has built more than 16km of new bikeways, most of which are protected or barred. Additionally, the *Central City in Motion* plan was just adopted to add 50km of low-stress bikeways and other pedestrian and transit projects in the central city.

The *Livable Streets Strategy 2017* prioritizes the use of the right-of-way for community gathering spaces and placemaking. The Portland in the Streets Community Grant Program supports community-driven projects focused on transportation safety, equity, innovation, and placemaking.

#### Portland's approach to Connected and Automated Vehicles (CAV)

Portland's Automated Vehicles Policy was adopted in May 2018 as part of the Transportation System Plan 2018 as the city recognizes that AVs will inevitably enter the city. Therefore, the city is taking the proactive stance to work with companies interested in AV testing in Portland and with community members to ensure safe and equitable trial. The goal is to "prioritize connected and automated vehicles that are part of a fleet/shared ownership." If AVs should enter the city, AVs need to advance the Vision Zero goal and demonstrate that travel time reliability and system efficiency will be improved.

To safeguard Portland's overarching transportation goal, Portland has the following strategies around AVs:

- Require sharing of anonymized transportation data such as vehicle type, travel routes, occupancy, travel times, etc. while ensuring that CAVs use city's rights-of-way
- Design and manage the mobility zone, called the Curb Zone, to increase safety and limit speed, and prioritize CAVs carrying more passengers in congested times and locations
- Evaluate the public cost and benefit before investing in AV infrastructure through a criteria-driven plan
- Develop sustainable user-payment funding mechanisms
- Ensure that CAVs connect to the city's smart infrastructure and pay for the infrastructure and service investments according to the vehicle impacts to the transportation system.

Portland sets the example of how a city could "get AVs right" by establishing strong fundamentals in the transportation system. Even as this disruptive technology enters the city, Portland ensures that it will improve access for all, smooth traffic congestion, improve commuter comfort and decrease road fatalities.



## 9. Protect the airspace of our cities

Both manually operated and autonomous aerial vehicles have started to become risks in our city airspace. Sales of drones are expected to grow from 2.5 million in 2010 to 7 million in 2016, a 180 percent increase (Federal Aviation Administration 2016). To protect the airspace, it is vital that it be managed with sustainable principles fit for the management of public space. Local authorities need to limit the operation of drones and flying automobiles and taxis in urban areas to safeguard the public.



## 10. We apply sustainability principles for moving goods: Green freight and ecologistics

The demand for freight and logistics services in cities is predicted to grow significantly with the growing demands of e-commerce and quick delivery. Planning for sustainable urban logistics is instrumental, as urban freight contributes to 20 to 40 percent of urban emissions, and carbon emissions in cities are predicted to increase by 160 percent by 2050 as freight volumes grow threefold according to the OECD trade projections<sup>\*</sup>. Thus, municipalities need to strategically consider the logistics of moving goods e.g. warehousing, transportation and delivery.

### Almada, Portugal

#### Sustainable freight as the key to creating an attractive historical town center

Located on the southern bank of Tagus River, Almada forms part of the Lisbon Metropolitan Area (AML). Most residents live in a well-developed urban core that comprises 40 percent of the municipal area. With an industrial background, Almada has since evolved to be a tourism and transportation hub. Almada maintains a long legacy of outstanding mobility planning, including urban logistics, as reflected in the city's latest *Strategic Plan for Urban Mobility* (PUMA).

The city presented the first *Sustainable Urban Logistics Plan* (SULP) in 2014, which is a key part of the PUMA framework. The process of drafting the SULP enabled municipal staff to evaluate current state of logistics within the city and identify potential actions to improve operational efficiency while reducing environmental impact. The SULP allowed the municipality to create the Almada Urban Consolidation Center (ULC), the flagship initiative that serves as a logistic base for gathering shipments from various logistics companies and consolidating delivery. The aim is to reduce the number of trips into the city center, which is dominated by narrow historic streets and improve last-mile delivery with the use of electric vehicles.

In 2018, Almada commenced the Living Lab for Decarbonisation of Almada (DLLab Almada), a project funded by the Portuguese Environmental Fund which translates the concept of circular economy into practice by implementing a set of innovative actions at the vibrant heart of the city with the goal of redesigning urban space. One of the key components of these actions is to reduce space competition between pedestrians and operators during loading/unloading by setting up another UCC with a nearly zero energy building approach. Related interventions include provision of real-time information on public transport modes that serve the area, introducing solar pavements and setting up a FAROL Platform which is a web-based information collation system of the DLLab<sup>\*\*</sup>.

\* ITF Transport Outlook, 2017

\*\* Francisco Gonçalves (2018, March 28). *Almada: Innovative project to promote circular economy and decarbonization of urban living*. Retrieved from <http://www.energy-cities.eu/Almada-Innovative-project-to-promote-circular-economy-and-decarbonization-of>

## 11. Engage with stakeholders

The trend towards shared, low emission, electric and autonomous vehicles directly impacts the lives, investments and economic livelihood of residents, businesses and other stakeholders. Planning for transportation and a livable city is not limited to physical spaces and infrastructure per se, but includes the salient social issues that emerge from the concerns of the residents. If the local government wants to make transport benefit the community, it is pertinent to optimize the planning approach to harness innovative ideas and co-create aspirations with the residents. As such, there is a strong case for cities to extend planning processes to include the local community. By understanding and addressing the local contexts the professional planners can create better-informed outcomes, while reinforcing the partnership between the local authority and the community.

### Münster, Germany

#### A collaborative planning and implementation process in transport planning

Münster is the bicycle capital of Germany with 470km of bike paths in all parts of the city and the surrounding Münsterland region. While the bicycle modal share is one of the main achievements of the city, the city works towards providing a multi-modal transportation system. This is reflected by the modal choice of the residents: 71 percent of all journeys are made on foot or by bicycle and public transport.

#### Understanding the community's satisfaction

The Transport Plan of the city was developed after assessing the community's satisfaction with the city's transportation system. The satisfaction survey, conducted annually, shows a general increase in approval of the system, particularly on the service quality (i.e., spatial and temporal service of the public transport). This consumer satisfaction survey serves as an important benchmark for the city's quality control. It takes into account equity aspects (e.g., gender aspects and the inclusion of vulnerable people) as well as efficiency standards (e.g. network design and accessibility).

#### The process

As the population will increase by 30 percent in 2030, the city is working towards expanding the public transportation system with some ongoing projects: (1) redevelopment and expansion of the tram system, Westfälische Landes-Eisenbahn (WLE); and (2) renewal of the Bremen Plaza which is east of the Münster Central Station. To develop these projects, the city embarked on a public consultation process through information sessions and focus group consultations that were led by the mayor. Results from the discussions are well-documented and available online on the city's website for transparency.

- Throughout Münster's public engagement process, the core success factors were:
- Adequate preparation of the projects, including project concept and cost-benefit analysis
- Participation and openness of the mayor and city staff to explain the plan and respond to questions or skepticism
- Continuous improvement based on the feedback received and the provision transparent information.



### Münster, Germany

Population: **310,039**  
(2016 census)

#### Modal Split (as of 2011)

Walking:	<b>22%</b>
Cycling:	<b>39%</b>
Public transport:	<b>10%</b>
Personal car:	<b>29%</b>

Münster (credit: Münster city)



Photo credit: Germán Sánchez Díaz

## San Miguel de Allende, Mexico

### San Miguel residents participate for the Sustainable Urban Mobility Plan

Within the state of Guanajuato, San Miguel de Allende is located in Mexico's rugged central highlands. Included in the UNESCO World Heritage list in 2008, it is known for its cultural and architectural preservation. While walking has always been one of the most common mobility choices in the city, the city seeks to make it safer and more pleasant to walk and cycle. After the implementation of pedestrian zone policy in some streets, walking in the city center is more convenient than ever. One of the focuses of the city is to decrease car dependency for intercity travel, while giving priority to cyclists and pedestrians and secondly to public transportation.

As part of the creation of a mobility plan for the city, hundreds of residents participated in the first local community engagement process, setting a precedent not only for San Miguel but for the whole state of Guanajuato. Residents expressed their opinions to help guide public policies that would improve mobility conditions in their neighborhood. A total of 20 topics related to urban mobility were discussed, including new schedules for public transportation. Some of the critical targets in the new mobility plan include:

- Minimizing motorized traffic flow in the historical center via the construction of park and ride facilities integrated with public transport
- Replacing the bus fleet with newer, less polluting units, and for some routes with smaller vehicles, while extending night service
- Promoting cycling by developing more cycling lanes and establishing a public bike rental
- Constructing a peripheral ring to prevent heavy vehicles from traveling through neighborhoods
- Ensuring safe transit of pedestrians in sidewalk and walkways.



Map of City of San Miguel de Allende, México.



### San Miguel de Allende, Mexico

Population: **171,857**

(2015 census)

#### Modal Split (as of 2015)

Walking:	<b>34%</b>
Cycling:	<b>1%</b>
Public transport:	<b>41%</b>
Personal car:	<b>24%</b>

Photo credit: Linzee Chavignon



## Sydney, Australia

Population: **4,792,281**

(2016 census)

#### Modal Split (as of 2011 travel to work)

Walking:	<b>25.3%</b>
Cycling:	<b>2.9%</b>
Public transport:	<b>29.5%</b>
Personal car:	<b>26.5%</b>

Photo credit: Sydney City

## Sydney, Australia

### Sydney Your Say

Sydney is the vibrant capital of New South Wales and one of the biggest cities in Australia, with 5 million residents. Being a multicultural and multinational city, community engagement is crucial to ensure that the needs and concerns of the minority are addressed and that future projects benefit all. Since 2017, Sydney has allocated 1.7 billion AUD for building and construction projects in the next ten years, covering 400 projects to enhance the city's livability and enhance cultural life. The investment includes public domain improvements such as parks and green space upgrades, new cycleways, public art showcases (e.g., artwork on the Eora minority) and increases in street tree canopy to reduce the heat island effect.

In most, if not all, of the existing and new projects, the city conducts a systematic community engagement process that is guided by their *Community Engagement Strategy*. This ensures that the community engagement process is transparent, inclusive and open for genuine dialogues with the residents, whereby the engagement should influence the outcome.

The city maintains a consultation hub, "Sydney Your Say," where residents can obtain regular updates and hold community sessions. The online platform is widely used by the city to gather and provide information to improve community accessibility. To gather residents' input, an annual wellbeing survey is conducted, while open data is provided to all, including transport and access, public domain, etc.

Furthermore, the city forms independent committees chaired by the Lord Mayor to hold regular sessions and gather input on pivotal issues. For example, the Local Pedestrian, Cycling, and Traffic Calming Committee established under the Roads Act is a technical review body to advise the City of Sydney Council on traffic-related matters although it has no decision-making powers. All agendas, meeting times and outcomes are documented and online.



Map of City of Sydney, Australia.



## 12. Prepare our local governments for mobility in the future

Transport and mobility are sectors of growing relevance and economic dynamism, but is also the potential site of environmental and social conflict, particularly for fast-growing cities. To prepare for the future, local governments must remain open to new technologies and change while prioritizing people and sustainability at the core of decision making. A vital tool for cities is the development of a Sustainable Urban Mobility Plan (SUMP) or equivalent transport planning document, with ambitious targets following the Sustainable Development Goals 2030 and the Paris Agreement on climate change, and implement these policies and plans.

Most EcoMobility Alliance cities maintain a SUMP to successfully guide policy changes that drive the mobility paradigm shift. It is pertinent to have an alignment of vision and coordinated efforts across different city departments that are focused less on single-occupancy private vehicles.

### Burgas, Bulgaria

#### Integrated and intelligent transportation system

Burgas is the second largest city on the Bulgarian Black Sea coast, located in the province of Burgas, Bulgaria. Key policies towards sustainable transport for the long term are presented in the *Strategy for Sustainable Energy Development of the Municipality (2011–2020)* and the *Action Plan (2011–2013)*. The *Sustainable Urban Mobility Plan (SUMP) (2014–2020)* identifies the main mobility goals Burgas hopes to achieve:

- Improve energy efficiency in public transport and diversify transport modes
- Reduce emissions from the transport system by increasing the use of biofuels and flexible high-speed public transport
- Improve accessibility
- Prioritize active mobility and public transport to reduce negative environmental impacts (e.g., air pollution)
- Enhance road safety for non-motorists and traffic safety through traffic calming
- Prepare an efficient freight vehicle policy.

Burgas is investing in an integrated and intelligent transport system. In 2015, the city launched the 11 million Euro Intelligent Transport System project to make its public transportation system safer, efficient and convenient. The plan includes the introduction of integrated ticketing and video surveillance of Burgas' public transportation system. Since November 2018, commuters have real-time access to the public transportation system information, including information on all buses and trolley buses, which are the primary transport mode of the city. It also upgraded the electronic boards at public transport stops to be more informative.

Other efforts have been undertaken since the SUMP was established. For example, the city improved walking access to public transport, with about 75 percent of the city areas located within 400m to a public transport stop. It is also the best biking city in Bulgaria, with good cycling infrastructure. Burgas shows the importance of translating the SUMP into reality.

**Burgas, Bulgaria**  
Population: **202,766**  
(2016 census)

#### Modal Split (as of 2016)

Walking: **2%**  
Cycling: **3%**  
Public transport: **37%**  
Personal car: **58%**

### Rosario, Argentina

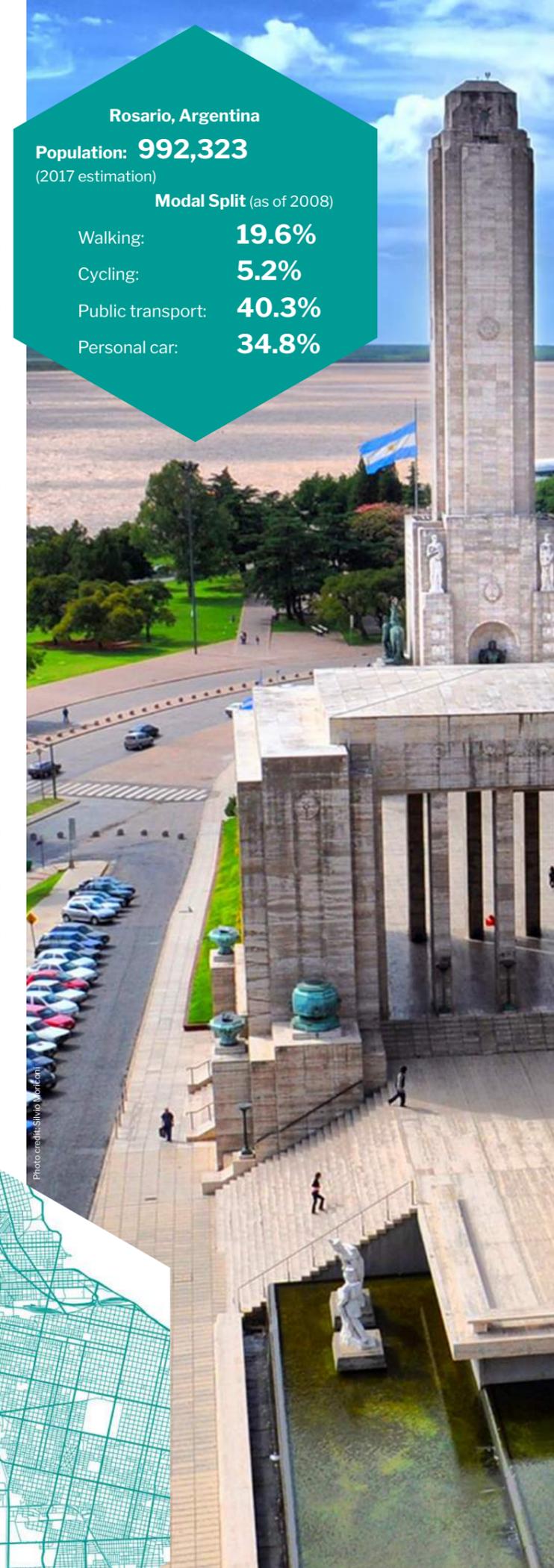
#### From vision to reality

Rosario is the third most populous city in Argentina, located about 300km northwest of the capital, Buenos Aires. The city is known for its dedication to improving the mobility system. Rosario published the *Metropolitan Rosario Strategic Plan* in 2008 which includes plans for modernizing transport and logistics infrastructure, advancing sustainable mobility within the metropolitan region, increasing rail transportation and enhancing participatory planning and management. Following this, the *Mobility Integrated Plan (Integral de Movilidad, or PIM)* was published as a result of a participatory process including residents, institutions, and local and international experts. This process led to the signature of the *Mobility Pact 2010 (Pacto de la Movilidad)*, which frames its mobility strategy around three pillars: improve mass public transport, develop active mobility and deter individual motorized transport. Since 2018, the municipality inventories GHG emissions generated by different sectors and activities within the city.

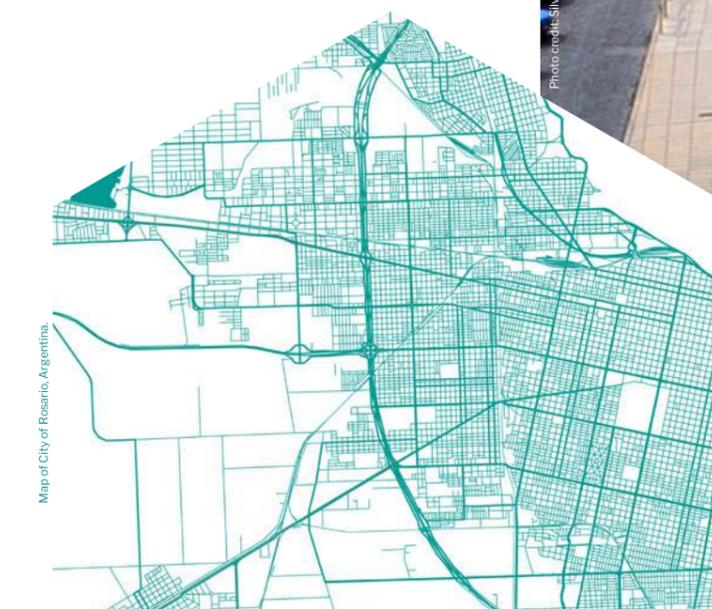
A key highlight of the PIM is public transportation. In the past years, various improvements and reforms were undertaken including, amongst others:

- Construction of a BRT system covering 10km
- Development of 63 lines of public transport including buses, trolley buses, and trams;
- Allocation of 25km of exclusive bus lanes
- Creation of a Mobility Monitoring Center to monitor traffic flows, occupancy lanes, parking areas, traffic lights and compliance with routes and schedules
- Establishment of a dynamic information system to help commuters with mobility planning
- Commencement of a the public bike sharing system with 280 bicycles and 18 stations.

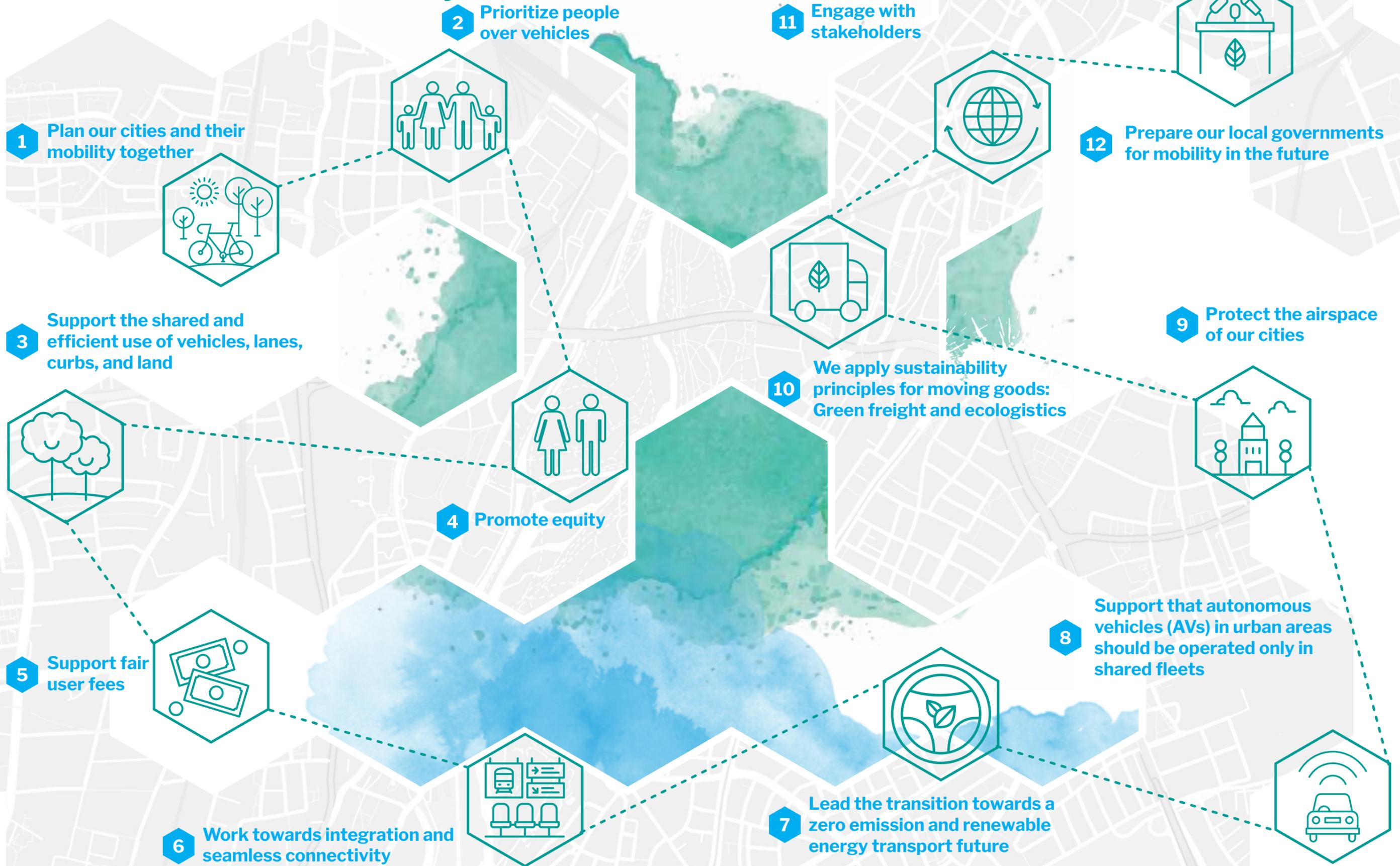
The municipality is about to start an extensive reform and standardization of its public transportation system, with plans to combine the current 63 lines into 40 new lines in the second half of 2019 to improve the routes and bus frequency and increase accessibility and ridership. The current bus fleet will be expanded to improve service frequency and quality. In addition, the city is studying the feasibility of implementing a potential tramway system, called the *Tranvía Metropolitano de Rosario*.



**Rosario, Argentina**  
Population: **992,323**  
(2017 estimation)  
**Modal Split (as of 2008)**  
Walking: **19.6%**  
Cycling: **5.2%**  
Public transport: **40.3%**  
Personal car: **34.8%**



# 12 Kaohsiung Strategies for the Future of Urban Mobility



# Coming up in the Alliance

The EcoMobility Alliance will bring global best practices to cities and give decision makers greater access to technical and political expertise to help them create ecomobile and sustainable urban mobility systems. As EcoMobility Alliance cities are at various stages of their journey in ecomobility, the EcoMobility Alliance will also facilitate exchanges between the Alliance cities and partners, and promote learning from international initiatives. Increased understanding of ecomobility could improve the cities' capacity to develop sustainable urban mobility policy, action plans and programs.

The EcoMobility Alliance is structured around three types of actions:



## Local Improvements

### Innovation and mobility improvement in Alliance cities

Local innovation can be driven through cooperation across continents. Through access to information, tools and partners, and by facilitating peer-to-peer learning, the Alliance allows cities to support each other and accelerate change.

### Performance measurement

Through the EcoMobility SHIFT assessment scheme, a tool developed by ICLEI, cities can now measure the urban transport performance. This is a service available to all Alliance cities and technical support can be provided by ICLEI when necessary. By identifying the gaps in their systems' performance, cities can make informed decision for improving them.



## Joint Initiatives

### Thematic working groups (TWG)

With help from ICLEI, participating cities can identify areas of mutual interest and are invited to form TWGs. This targeted sharing of experience and knowledge allows for collaborative actions, fundraising and cooperation with partner organizations.

### Joint program of activities in selected areas

While cities cooperate in TWGs based on their interests, the EcoMobility Alliance will also choose two to three joint working areas for collective action, such as urban freight (EcoLogistics). These working areas aim to translate theory into practice.



## Global Outreach

### Showcasing the progress of EcoMobility pioneers

Alliance cities are continually developing and implementing solutions that improve the mobility options available to their residents. By analyzing and sharing these experiences, the Alliance hopes to inspire replication of good practices locally and globally. In partnership with experts, the Alliance will continue to author case studies, briefing sheets, working papers and position papers on cities and their urban mobility programs.

### City voices at a global level

The Alliance will continue to provide cities with a global stage with which to represent local governments in discussions and debates on sustainable urban transport. ICLEI will continue to highlight commitments, actions and best practices of cities in advocating for EcoMobility. It will also outline the frameworks required by cities to further progress, as well as the need for capacity building, economic opportunities and access to finance.



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### EcoMobility Alliance Report 2018

This publication should be cited as ICLEI-Local Governments for Sustainability, 2018. EcoMobility Alliance Report Phase 2018. Bonn, Germany

#### Publisher

ICLEI-Local Governments for Sustainability e.V.

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