Smart City – Good Practice

Transport and mobility

EcoBici - bike sharing programme

Mexico City, Mexico

Mexico City's public travel by bike project for residents and tourists

EcoBici, Mexico City's bike sharing programme, was launched in 2010 to increase cycling while simultaneously reducing traffic congestion and transport related greenhouse gas emissions within the city. Bikes placed at several stations are able to be used for transportation within the city when users register and pay a small fee. Since the programme's introduction in 2010, user demand has grown rapidly in tandem with an extension of bike and bike station infrastructure, which is currently (2015) spanning over an area of about 35km². The programme started with about 84 bike stations and 1,200 bikes. By 2015, bike stations had increased to 444, hosting more than 6,000 bikes, which can be used by the already over 100,000 users [1]. Mexico City has also constructed about 300 km of new bike paths throughout the federal district [2]. These new bike paths are not only benefiting EcoBici users, but also all cyclists within the city.

Country/ City Profile

Country		City	
Population (2013)	122.3 million [3]	Population (2013)	9 million (city) [4] 21.2 million (metropolitan) [4]
Land area (km²)	1.964 million	Land area (km²)	1,485 (city) ~4,250 (metropolitan)
GDP per capita (2014, current international $, at purchasing power parity)	17,167 [10]	GDP per capita (2014, US$, at purchasing power parity)	n/a (city) 19,239 (metropolitan) [5]
Region	Latin America	Region	inland

City's physical geography	Location	✓ Closed basin, surrounded by mountains and volcanoes = no natural drainage outlet **(flooding risk, frequent seismic activity, weak air circulation)** ✓ Placed on an earlier lake bed = soft base **(downwelling challenges = challenges in groundwater and waste water management)** ✓ Relatively high altitude (~2,250m) = lower atmospheric oxygen levels
	Climate	✓ Subtropical highland climate (average temperature: 12-16 C°) ✓ 820 mm/year annual rainfall, anti-cyclonic wind system = weak air circulation

Initiating context

EcoBici was launched as a mitigation action under Mexico City's Plan Verde (Green Plan). Mexico City's Plan Verde was introduced in 2007 to address climate change and reduce greenhouse gas emissions within different areas. Although initially not set as legally binding, these issues are set to be addressed by the introduction of several programmes and actions within a 15-year period (2007-2022). To reduce greenhouse gas emissions, one of the key areas covered by Mexico City's Plan Verde is the achievement of sustainable transportation and mobility. As Mexico City is located on a relatively high altitude (~2,250m), lower atmospheric oxygen levels hinder complete fuel combustion, thus increasing emissions. In order to decrease transportation based emissions, several actions to improve cycling and pedestrian conditons as well as the public transportation system have been introduced. EcoBici is one of these actions implemented under Mexico City's Plan Verde [6].

Project description

Mexico City's public bike sharing project, EcoBici, has been introduced as an alternative mobility system to complement public transportation services. Bikes are free to use by citizens as well as tourists if users are registered and pay a small, affordable fee for a favored period of time (one year, one week, three days or one day). Registration can take place at customer service centers as well as several modules and stands spread throughout the city. If registered, users receive an EcoBici card, which enables to take a bike on a selected bike

station, cycle around and return it to the next clostest station within a 45-minute trip. If this time is exceeded, an additional fee will apply. In 2015, the EcoBici homepage stated that a general one day membership costs about 90 pesos (~5.6 Euros[1]) while an annual membership costs about 400 pesos (~25 Euros[1]). [1] Bike stations are usually located close to public transportation stops, which allows for an effective combination of different types of transportation [6].

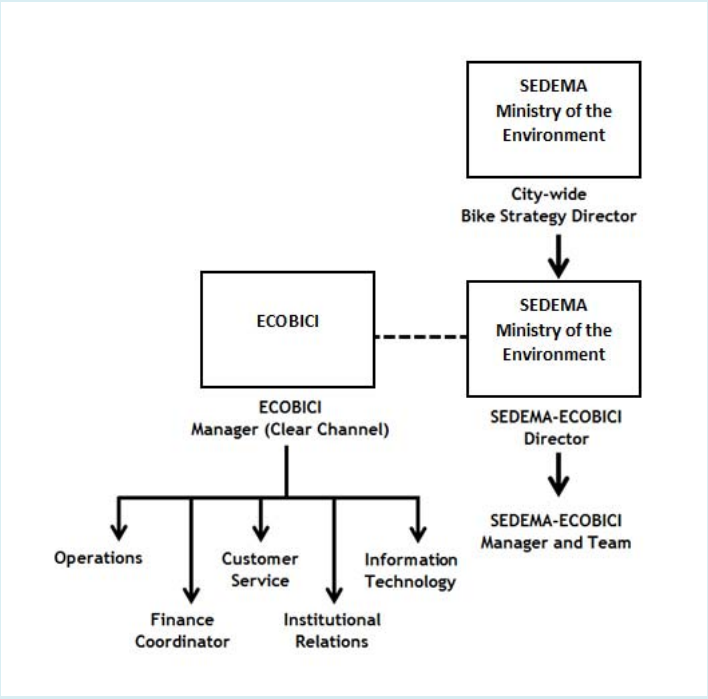
Implementation process

EcoBici has been implemented by the Mexico City Government according to a bike mobility strategy. Its first phase took about one year to plan and six months to implement. The project's infrastructure has been increasing ever since [7]. The table below summarises the project's most important implementation steps and features, demonstrating a bike sharing programme's realisation within a megacity of an emerging country.

Projects implementation details [7]

Process	After a one year planning phase, EcoBici's first phase has been implemented within 6 months, thus bringing 84 bike stations and 1,200 bikes into service. EcoBici's infrasturcture has been extended ever since.
Financing	Local funding source - capital investment for EcoBici has been 100% funded by Mexico City's general budget and amounted to about 3,400 Euros[1] per bike. Average operating costs per trip are stated to amount to about 1.2 Euros[1].
Leadership	EcoBici has been implemented by Mexico City's government. The project is administrated/implemented by SEDEMA, the Mexico City's Ministry of the Environment. The operator of the system is a private company called "Clear Channel," which is contracted by SEDEMA to run the project.
Involved stakeholders	**Operators** ✓ Mexico City Government **(implementing agency)** ✓ SEDEMA – Ministry of the Environment **(implementing agency)** ✓ Clear Channel **(company, private operator)** **Users** ✓ City residents ✓ Tourists

Organizational Structure



Source: based on [7], p. 90

Results

With the implementation of EcoBici, Mexico City's public transportation system has been diversified, which not only reduces greenhouse gas emissions and traffic congestion, but has several other positive co-effects. Among them are reductions in air pollutant emissions (e.g. NOx, PM, SO2, CO, NH3 etc.), increased health benefits for residents and users (improved air quality, physical activity) and travel time savings.

Reduction of CO_2 emissions and other co-benefit achievemenets have already been expressed in absolute numbers for the first three years of the project (2010-2013).

[1] Rate of exchange, April 2015

Project benefits (2010-2013) [8]

CO_2 emission reductions	232 TonCO_2eq	SO_2 emission reductions	4.01 kg
Travel time savings	2,065 days	CO emission recductions	16,489 kg
Avoided vehicle ways	7,364.6 thousand km	NO_x emission reductions	1,811 kg
PM emission reductions	15.2 kg	NH_3 emission reductions	61.6 kg

The study, carried out in 2013, also projected an increase in EcoBici's benefits in the following years. From 2010-2020, the total redcution in carbon dioxide emissions has been estimated to be 3,641 TonCO_2eq or the equivalent of planting about 10,938 trees within the same time span. Emissions reducitons are also estimated to increase on an annual basis as the EcoBici system is expected to grow over time [8].

Based on 2012 results, EcoBici bikes have been mostly used for travelling from home to work and back. EcoBici users are 34.7 years old on average. The avearge duration of trips is approximately 30 minutes and trips are mainly combined with walking or public transportation offers such as bus and metro [9].

Statistics on accumulated trips and registered users show about 22.5 millions trips and about 159 thousand registered users at the beginning of April 2015 [1].

Lessons learned

Several factors are seen as important in implementing a bike sharing system within an emerging megacity. Besides careful planning and integrating public participiation in the project's implementation, affordability is extremely important. Affordability is crucial in Mexico City as the city has a high portion of "poor" residents. The distribution of poor residents in Mexico City may be similar to many other emerging cities in the world, which makes this project potentially applicable to other cities. To implement a successful bike sharing project, it is also important to have the proper infrastructure such as bike paths or the strategical placing of bike stations. If bike stations are located close to public transportation stops, accessiblilty of different locations using low carbon transportation is increased [6].

References

[1] EcoBici webpage: www.ecobici.df.gob.mx

[2] Green Buildings City Market Brief , Mexico City: http://www.worldgbc.org/files/1414/0982/5897/Mexico_City_-_City_Market_Brief_Final.pdf

[3] World Bank: Data Mexico: http://data.worldbank.org/country/mexico

[4] World Population Review (2014): Mexico City Population 2014: http://worldpopulationreview.com/world-cities/mexico-city-population/

[5] 2014 Global Metro Monitor Map, Mexico City: http://www.brookings.edu/research/reports2/2015/01/22-global-metro-monitor

[6] Marchesi, S. (2010): ICLEI Case Studies: Mexico City, Mexico; Mexico City's Green Plan: Eco Mobility in motion: http://www.ecomobility.org/fileadmin/template/project_templates/ecomobility/files/Publications/CS_Mexico_city.pdf

[7] ITDP (2013): The bike-share planning guide: https://www.itdp.org/wp-content/uploads/2014/07/ITDP_Bike_Share_Planning_Guide.pdf

[8] EcoBici (2013): Reduction study GEI y Co by ECOBICI: https://www.ecobici.df.gob.mx/sites/default/files/pdf/reduccion_gei_y_co-beneficios_generados_por_la_implementacion_del_programa_ecobici_201020112012.pdf

[9] EcoBici (2012): Survey ECOBICI 2012: https://www.ecobici.df.gob.mx/sites/default/files/pdf/estudio_encuestas_ecobici_2012.pdf

[10] World Bank: GDP per capita, PPP: http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD

(accessed: April, 2015)

Author/ Contact

© JOANNEUM RESEARCH – LIFE: Centre for Climate, Energy & Society

Leonhardstraße 59
8010 Graz, AUSTRIA
Tel. +43 316 876 6700
life@joanneum.at

http://www.joanneum.at/en/life/