

Changwon, Republic of Korea

The Nearby Useful Bike, Interesting Joyful Attraction (NUBIJA) Project



The City of Changwon introduced a public bicycle system (Nearby Useful Bike, Interesting Joyful Attraction, NUBIJA) in March 2008 with the aim of contributing to an eco-friendly urban environment. The NUBIJA program is a user-friendly model of sustainable transportation made possible by integrating technology, public opinion and political leadership.

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ICLEI Case Studies

Updated, May 2012

Abstract

Changwon's aim was to introduce a user-friendly bicycle system that would become part of the city's urban landscape. The city has managed to create a bicycle system matching its own particular needs by researching other cities' bicycle programs, analysing Changwon's physical conditions and by applying advanced technologies. The NUBIJA system has led to improvements in citizens' health, job creation and has also laid the foundation for a low-carbon transportation culture. The extensive use of information technology and implementation of a cyclist's insurance system are among NUBIJA's unique characteristics.

The Importance of bicycles

The bicycle has enjoyed popularity since it was introduced in the early nineteenth century. Even though it lost some of its popularity with the advent of the automobile, many still use a bicycle as a means of transportation in their daily lives. The bicycle has the potential to contribute even more to urban sustainability and curbing greenhouse gas emissions. This is why cities must enable their citizens to use bicycles by adapting infrastructure or by building public transportation that accommodates bicycles.

In many Asian cities, cycling retains a high modal share and plays a large role in the transportation of people and goods. In China, particularly in some smaller cities such as Tianjin and Shi-Jia-Zhuang, more than half the population commutes by bicycle. Even in Shanghai 3.5 million bicycles are in circulation, accounting for 31 percent of all commuting trips. Some good examples are also found in South America; cycling in Bogotá, Colombia, for example, has been increasing after providing infrastructure.

Bicycles are also a big player in European transportation: Bicycle share, in all journeys, in Netherlands was 26 percent in 2009 and was the highest share in Europe. In some cities in the Netherlands, the mode share of bicycles exceeded 30 percent, for example, Groningen 38 percent, Zwolle 37 percent, Leiden 33 percent, Ede 32 percent and Veenendaal 32 percent..



Population / Land area

1,107,024 Mill. / 747 km²

Municipal budget

Approx. \$2,058 million USD (per year) (€1,586 million)



Case Study

Early indications of success

Between 22 October 2008 and 31 December 2011, the NUBIJA program:

- Grew from 20 to 230 terminals where bikes are rented and returned. These spaces normally include a kiosk, racks and lockers;
- Expanded from 430 to 4,500 NUBIJA bicycles;
- Developed a real-time control system;
- By the end of 2013, NUBIJA is projected to operate 280 terminals and 6,000 NUBIJA bicycles.

The city context

Changwon, located at the centre of the Republic of Korea's southern Gyeongnam province, is the engine of regional industry alongside neighbouring cities Busan and Ulsan. While it experiences four distinct seasons, Changwon's weather is often mild and warm. The city's well-developed roads have prompted the rapid acquisition of cars; there was an average of 7.6 percent growth in car ownership between 2002 and 2007. Bicycle ownership was at 3.2 percent in 2006.

Changwon identifies climate change as the most important problem facing the planet and views adaptation and mitigation as top priorities – for the welfare of its population and for the survival of its local industries and economy. With these issues in mind, Changwon also hosted the first World Congress on Mobility for the Future of Sustainable Cities in October 2011, convened by ICLEI and the Global Alliance for EcoMobility.

Changwon: Pedaling toward a sustainable future

Changwon instituted the NUBIJA program out of the desire to be a leading model of urban sustainability. Prior to NUBIJA, Changwon citizens perceived biking as a leisure activity only and bicycles were seen as private property rather than as a means of public transportation. The goal of NUBIJA is to make the bicycle a common means of urban transportation for Changwon's citizens.

Changwon applied state-of-the-art technologies to develop NUBIJA including a bicycle developed specifically for the program, called the NUBIJA Bicycle. The NUBIJA bicycle is equipped with:



Photo: © City of Changwon

NUBIJA bicycle storage point

What's in store for the NUBIJA project:

- Introducing a Korea-manufactured NUBIJA bicycle for better quality and management;
- Introducing a transit discount system to facilitate transfer between NUBIJA bicycles and city buses;
- Offering NUBIJA data via cell phone;
- Installing of a bicycle terminal canopy which uses solar energy;
- Building a global alliance among major cities which have public bicycle loaning programs: The 'Global Alliance for Public Bike Cities.'

- a special handle,
- a self-lock supplementary device,
- program signs and logos which ensure safety and security while also establishing the visual presence of NUBIJA in the city

Bicycle storage points were installed where cyclists can lock and unlock the Radio Frequency Identification (RFID) device used on every NUBIJA bicycle. Kiosks were set up to manage integrated loaning and returning information, to search the locations of other NUBIJA terminals and to provide security at terminals. A central control center was also established to operate and survey the NUBIJA program.

In addition to technological investment, the city held events such as public workshops, bicycle promotion campaigns, bicycle riding lessons and bicycle safety training to increase public awareness and encourage riding. Changwon took the step of introducing citizen bicycle insurance – a first for the Republic of Korea – which compensates Changwon citizens involved in a bicycle-related accident.

Results and impacts of the project in the community

Changwon applied innovative ideas and cutting-edge technology toward the development of NUBIJA and has set the foundation for a low energy consumption transportation culture in the city. Cycling was not a traditional means of late-night transportation prior to NUBIJA, now commuters use bicycles for short distances during the night – even after midnight. The program has:

- Improved cyclists' physical and mental health, according to popular opinion;
- Reduced the transportation-related burden on household budgets; bicycles, when used as a primary mode of transportation, can save about 80 percent of a person's total transportation expenses if he/she previously depended on a car;
- Created jobs from an expansion of bicycle-related industries – approximately 3,600 new positions each year. NUBIJA has also stimulated more activity in the advanced technology bicycle industry;
- Raised the transportation mode share of bicycles from 3.2 percent in 2006 to 10 percent at the end of 2011. Changwon targets it up to 20 percent in 2020;

- NUBIJA had 147,060 members as of September 2011. The program offers weekly, monthly and yearly memberships; 55.4 percent of NUBIJA users have a yearly membership;
- Helped raise Changwon's climate change protection profile because of its environmental, economic and social achievements;
- Saved 4,296 million KRW (\$3,760,000 USD) through reduced oil consumption and lowered the city's CO2 emissions by 5,489 tonnes per year.

Lessons learned

The idea of a public bicycle system posed logistical challenges in Changwon. For example, how would the city handle loaning and returning bicycles and how many bicycle loaning stations would suffice? Many obstacles were addressed prior to the implementation of the project by researching bicycle programs in other urban centers. Overarching challenges were addressed in the following ways:

Infrastructure: Improvements to Changwon's infrastructure is a key factor in the success of the NUBIJA program. As part of its effort to create a bicycle-friendly environment, the city repaired bicycle paths, bicycle-pedestrian paths, crossroads at intersections, created new paths and improved security along cycling areas. The city has also lowered the speed limit for cars and narrowed vehicle lanes to create more room for bicycles – a process called 'road diet.'

Public incentive: In addition, Changwon created the Republic of Korea's first-ever bicycle insurance program as an incentive for prospective cyclists. The NUBIJA program showcases the importance of integrating technological innovation into a municipal bicycle program, particularly with regard to creating a bicycle loaning system. For example, the NUBIJA developers introduced a Global Positioning System (GPS) to track bicycles and prevent theft. GPS is a satellite-based navigation system which tracks location and time information.

Background research: The NUBIJA project developers thoroughly researched bicycle programs in other cities and carefully assessed Changwon's physical compatibility with bicycles as well as how the city's infrastructure would accommodate an influx of bicycles .

Political leadership: Consistent support from Changwon's local leaders has played a significant role in the success of the NUBIJA program. When challenges arose, policy-makers made decisions in an efficient manner to ensure NUBIJA's successful launch.

Stakeholder involvement: Efficient and fast responses to public complaints and suggestions has proved invaluable to securing strong connections with NUBIJA consumers. Even before NUBIJA's launch, the city held several open committee meetings designed to collect citizens' feedback.



Bicycle safety training

Replication

Changwon is open to sharing NUBIJA's development process with other municipalities and would also explore partnerships to replicate the program.

In 2011, Changwon, together with ICLEI, organized the first World Congress on Mobility for the Future of Sustainable Cities, EcoMobility Changwon 2011 to bring together actors working in the field of EcoMobility. The participants from 34 countries had an opportunity to learn and experience success of the NUBIJA system.

The NUBIJA model has strong potential for replication in cities where local leaders are politically committed to tackling climate change and where reforming urban transport is a key priority.

It is not easy to introduce a sustainable transportation system to a city, such as Changwon, whose planning and organization caters to automotive transportation. Changwon has managed to conquer this obstacle, and several others, by frequently communicating with its citizens about the program, soliciting public opinion, using technology in an effective way and benefiting from consistent support from local policy-makers. Behind the success is also a strong political will.

The NUBIJA program is funded through public resources and does not benefit from private sector assistance. In cities where public resources are limited, city-to-city partnership funding, or international climate funding could be considered.

Keeping fees low

Bicycle rental fees are purposely kept low to encourage cycling:

- Two hours of bicycle time are free of charge
- 1,000 KRW (\$0.80 USD) for a full day.

NUBIJA Member rates:

- 2,000 KRW (\$1.60 USD) a week;
- 3,000 KRW (\$2.40 USD) for a month;
- 20,000 KRW (\$16.00 USD) for a year.



Photo: © City of Changwon

Street-side bike paths keep cyclists safe

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Budget and finances

The NUBIJA program was launched in March 2008 and will be completed by 2012. The total cost of the program, which is funded by Changwon's municipal budget and a federal subsidy, is 15,000 million KRW (\$12.5 million USD). Changwon plans to invest these funds over a total of five years from 2008 to 2012:

- 1,600 million KRW (\$1.3 million USD) comes from federal government sources.

Sources

- *A performance report for one year after its introduction*, City of Changwon, November 2009.
- *Foundation of Low-Carbon Green Development Basement using Green Transportation System*; NUBIJA, City of Changwon, November 2009
- NUBIJA website: www.bike.changwon.go.kr

Acknowledgements

- Author: Park, Seong Jae; Editor: Emma Wadland
- We would like to thank staff of the City of Changwon for their collaboration and cooperation.
- We would also like to thank Nuno Quental, EcoMobility Officer, Global Alliance for EcoMobility



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May 2012