The Future Proof City: Busan Eco Delta Smart City

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1. Korea Smart City; Experimenting Busan Eco Delta Smart City
Busan Eco Delta City

- **Area**: 11.77ha
- **Population**: 76,000 people (30,000 households)
- **Functions**: Residence, commerce, R&D, Logistics, and etc.
- **Project by**: Busan Metropolitan City, K-water, Busan Metropolitan Corp.

**Key Locations**
- Busan Metropolitan City
- Nakdong Riv.
- Maekdo Riv.
- Peyonggang Stream
- New Port
- The mouth of Nakdong Riv.
- West Nakdong Riv.
- Gyeongnam (Gimhae, Changwon)
- < Airport
Busan Eco Delta City Land Use Plan
2. The Future Proof City
Three Innovation for “Korea Smart City”
Vision

Bring forward futuristic living where the nature, people and technology come together

Key Value

Foster 4IR technology & improve quality of life

Busan Eco Delta Smart City aims to adopt the Fourth Industrial Revolution technologies to lead future industry and allow citizens to benefit from fair opportunity and inclusive growth with increased quality of life in the areas of education, culture, safety and environment.
Busan Eco Delta Smart City

Smart City National Pilot Project

<table>
<thead>
<tr>
<th>Area</th>
<th>2.8 sq km</th>
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<tbody>
<tr>
<td>Population</td>
<td>8,500 people (3,380 households)</td>
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<td>Functions</td>
<td>The city where the major technologies of the 4th Industrial Revolution and the ecological settlements are harmonized with three streams as the center</td>
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Ten Innovations That Add Values to Urban Living
Six objectives for Busan Eco Delta Smart City

- Work & Life Balance: 50:50
- Renewable energy: +20%
- More convenient with less waste and environmental costs
- Smart city
- 5 years longer health life
- New jobs: 28,000
- 125 hours savings

Quantitative overview of six objectives and twenty-eight KPIs for Busan Eco Delta Smart City
Key Performance Indicators (KPIs) for Busan Eco Delta Smart City (Draft)

* The KPIs presented here are drafts and are subject to change as the project progresses.
Operation process of Key Performance Indicators (KPIs)

Planning & designing

Draft of 28 KPIs

Masterplan

Adjustment of KPIs

City building

Adjustment and finalization of KPIs

KPIs monitoring and evaluation

Response

Reflected in city management plans

Six objectives

PEOPLE
- 5 Years Longer Health Life
- Work & Life Balance 50 : 50
- Renewable Energy Additional 20%

NATURE
- Recycle 100%

TECHNOLOGY
- Savings 125 Hours
- New Jobs 28,000

Pilot operation

Full implementation

Citizen engagement

Expert advice

Feedback
1 5 Years Longer Health Life

01 | To improve the water quality of Pyeonggang Stream and Macdo River to Class II or better
02 | Early flood detection - 6 hours ahead
03 | Reduction of earthquake early warning time to 20 seconds or less
04 | Lowering of road accident rate to under 46%
05 | 100% complete early fire response in 5 minutes
06 | 25% reduction in 5 major crime rates
07 | 4.5-year increase in average life expectancy
08 | Plus 3 years in healthy life expectancy
A person who walks 2.5 to 5 hours in a week have 3.4 years of longer life expectancy and those who walks 5 to 7.5 hours live 4.5 years longer.
Save life & money

- 6-hours advance or better flood forecasting
  (The latest precipitation forecast radar & water-related disaster response system)

- Early response to fire (5 minutes)
  (Optimizing the Process of detection, public notification, resources deployment, and control)

- Within 25 seconds of earthquake warning and 25% reduce crime rates
  (Human & natural disaster forecast with intelligent monitoring infrastructure)
1 5 Years Longer Health Life

5 years longer and healthy life
2 Work & Life Balance 50:50

- 09 | 76.16m² of park space per capita
- 10 | 20,000m² of festival street (40m wide, 500m long)
- 11 | 100% ICT-based learning
- 12 | 15% reduction in time on housekeeping
- 13 | 40 weekly working hours
3 Renewable Energy
Additional 20%

14 | 50% reduction in carbon emissions
15 | 120% of required power from renewable sources
16 | Zero-energy houses for 56 homes
4 Recycle 100%

17 | 100% wastewater reuse
18 | 20% reduction in water usage and unused waste per person
19 | Impervious area down to under 15%
20 | 16.5% of required power from wastewater-thermal energy
21 | 35% of required power from SRF (Solid Refuse Fuel)
5 Savings 125 Hours

22 | 5 hours less waiting for medical consultation
23 | 21 hours less spent in administration
24 | 35 hours less spent on providing security and safety annually
25 | Over 20% of mobility enabled by bicycles
26 | 4 hours saved annually to find parking space
27 | 60 hours less time wasted on road annually
Mobility Saves 60 hours

- 7.5 seconds less traffic light waiting time
- 30% increased vehicle speed
- 46% less traffic accident
- Open Data Platforms enable citizens to choose the fastest and most optimal public transportation line
Public safety saves 35 hours

- Machine learning and Neural network powered tools such as PrePol will be used to predict crime spots on given day

- Priorities emergency vehicles via advanced traffic preemption system
Productivity saves 21 hours

- Apps or digital services will simplify administrative processes when citizens interact with city agencies.

| 60       | +35     | +21     |
Healthcare saves 5 hours

- Improve administration and preliminary diagnosis to reduce waiting time
- Healthcare preventative apps & telehealth aim will be used for better overall wellbeing
Smart parking saves 4 hours

- 5mins of reduction for searching a parking space
- 30% of reduction in navigational path for looking for a parking space

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<th>60</th>
<th>+35</th>
<th>+21</th>
<th>+5</th>
<th>+4</th>
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125 Hours
Give back the time to the citizens.
5  Savings 125 Hours

Time & convenience

125 hours
Savings
New Jobs 28,000

- **Open municipal innovation cluster**: Public office cluster for relevant agencies under Busan City
- **Healthcare & robot innovation cluster**: A cutting-edge medical center with medical, health, research, and residential features
- **Water energy science village**: Smart house blocks with water-nature-energy technologies
- **New Korean Wave AR/VR cluster**: Comprehensive culture space for Korean Wave featuring entertainment, F&B, and shopping elements
Digital Transformation

Eco Delta Smart City Platform

- **Digital city platform**: Open data collection–management–utilization
- **Augmented city platform**: Real-time data convergence in both the digital twin and the real world
- **Robot city platform**: Optimized for robotics development and applications

Conventional smart cities

- Infrastructure–data–utilization process for each service
  - Need separate investment & development to connect services
  - High development cost
  - Difficult to apply and validate new ideas
  - Top–down development

Busan Eco Delta Smart City

- Shared infrastructure elements between services
  - Unrestricted convergence between services
  - Reduction in the development cost
  - The entire city can be used as a testing lab
  - Bottom–up development
Digital Transformation

Urban planning Real World
Conceived Urban Planning by Imagination

Urban planning Digital World
Augmented Urban Planning by Big Data, AI, IoT etc.
Digital Transformation
Digital Transformation

Digital Twin Tsunami Simulation for Busan Eco Delta Smart City
Citizen Engagement

First avenue for smart city
Realizing proposals and ideas

Citizen engagement in coordination with various private business and expert opinions in each phase of design, implementation, operation & management

Living lab network
Citizens at the center of innovations to solve various urban problems

Social Problem Issues

Role of maker such as engineer and company
Interest and exploration in social, regional problems
Expansion of evaluation and utilization

Living lab

Joint technology planning
Experimental demonstration
User feedback

Citizens solve the problems

Commer- cialization
Solving social problems
Improving the law and regulations

Various labs led by different entities:
1. Business
2. Local government
3. Research institutes
4. User
Thank You!