



2nd Generation CPTED Strategies and Effect for the Urban & Rural Complex City

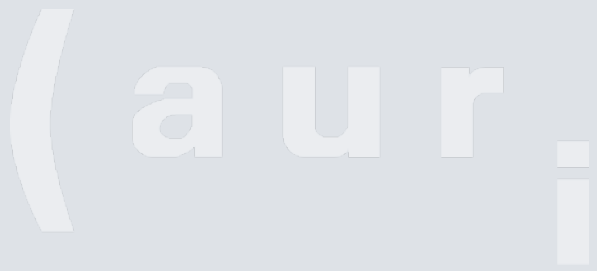
[2017 ICA International Conference]

AUG.07. 2017

Architecture and Urban

Research Institute

Dongpil Son



Contents

1. Outline
2. CPTED Plan for Urban & Rural Complex City
3. CPTED Evaluation for Urban & Rural Complex City

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1. Outline

1-1 Introduction

1-2 Salt Way

1-3 Necessity of the Project

1-4 Guidance of the Project

01 Introduction

Introduce Architecture and Urban Research Institute (AURI)

History

- 2007.06 ● **Establish AURI**
- 2007.08 ● Enact Framework Act on Building
- 2010.12 ● Pedestrian Environment Research Center inaugurated
- 2010.12 ● National Hanok Center inaugurated
- 2012.12 ● Architectural and Urban Policy Information Center inaugurated
- 2014.03 ● National Public Building Center inaugurated
- 2014.11 ● National Urban Regeneration Assistency Agency inaugurated
- 2015.01 ● Architectural Services Industry Promotion Center inaugurated
- 2016.03 ● **CPTED Research Center inaugurated**

Objectives

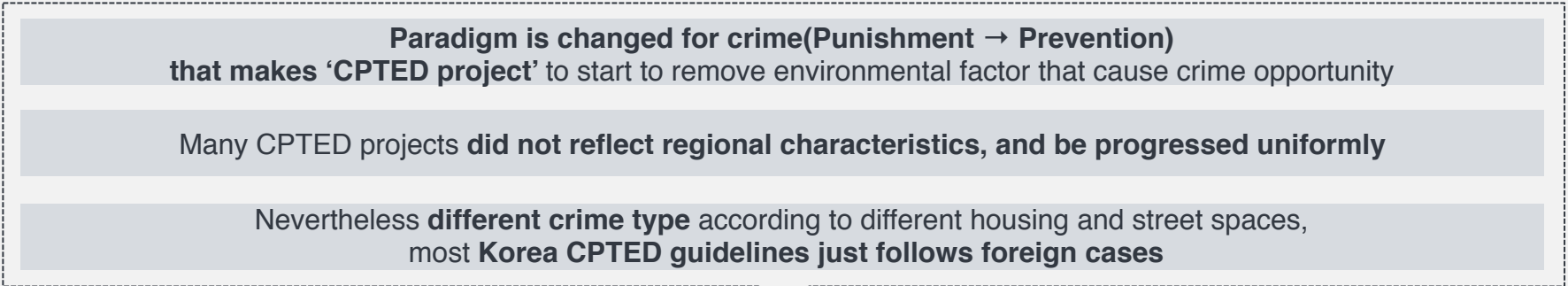
- **AURI is the first national research institute in architecture and urban research established by the President to revive the value of architectural and urban spaces** as a physical foundation that improves quality of life, builds cultural pride and contributes to the betterment of our international image and competitiveness

Functions

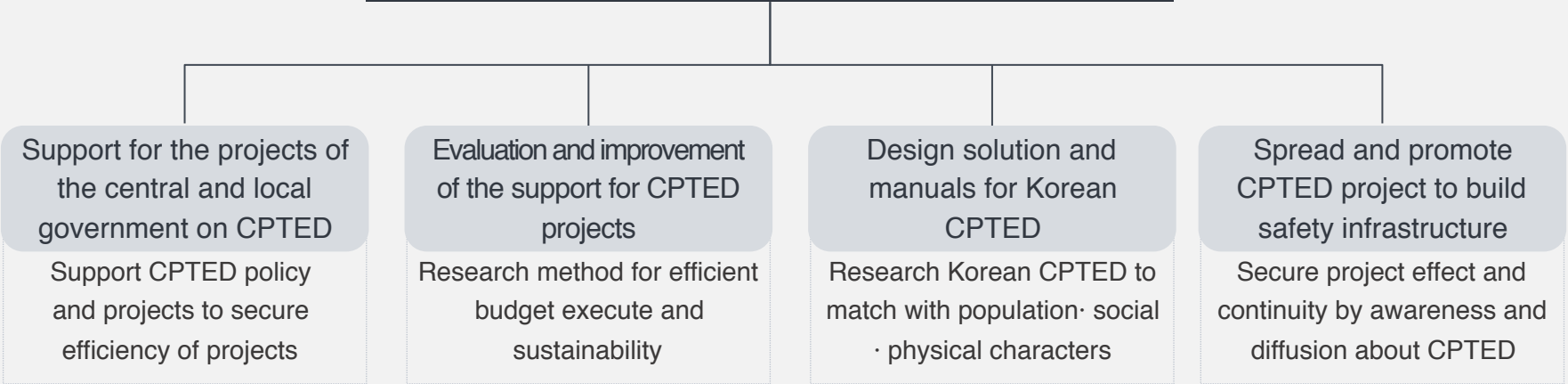
- Develops policies for public-oriented architecture and urban environment
- Conducts studies to strengthen quality of architectural design
- Establishes policies and support for urban projects of both national and local governments
- Enhances industrial competitiveness in the field of architecture and urban space
- Establishes networks and educates experts about public projects
- Builds and operates database for architecture and urban culture

01 Introduction

CPTED Research Center



CPTED Research Center inaugurated



01 Introduction

History of Korea CPTED Policy

Law for CPTED

- 2010.01** ● **Standard for Sustainable New Town Planning**

 - Establish planning standards for crime Prevention
- 2011.07** ● **Enforcement Decree of the National Land Planning and Utilization Act**

 - Article for crime prevention is included in city and gun planning
- 2012.05** ● **Enforcement Decree of the Framework Act on the National Land**

 - Article for crime prevention is included in Do comprehensive planning
- 2014.05** ● **Building Act**

 - Standards for crime prevention at building construction
- 2015.04** ● **Notification Crime Prevention Building Standard**

 - Standards for crime prevention at architectural design of definite purpose and scale

Guideline for CPTED

- [The National Police Agency]** ● **2005**

Design Guide for Crime Prevention

 - Introduce application method by building and space type according to CPTED principles
- [Korea Land and Housing Corporation]** ● **2011**

Internal Guideline for Crime Prevention Design

 - Introduce CPTED standards about architecture, landscape, electricity and machinery etc.
- [Ministry of Land, Infrastructure and Transport]** ● **2013**

Guideline for Crime Prevention Design on Building

 - Introduce CPTED standards about preview, principles, light, landscape and housing type
- [Seoul Metropolitan City]** ● **2013**

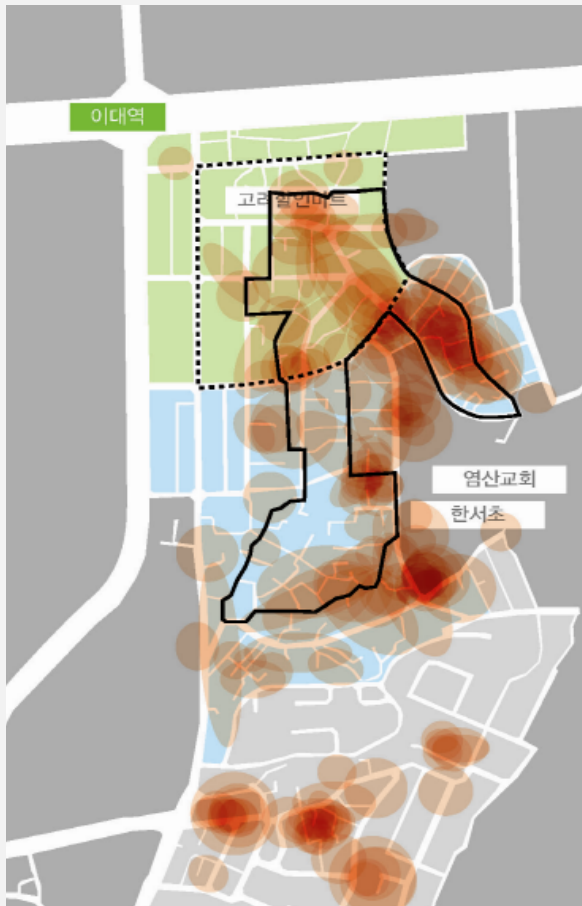
Guideline for Crime Prevention through Environmental Design

 - Apply for city safety, building up safe city project and community involvement type urban regeneration project

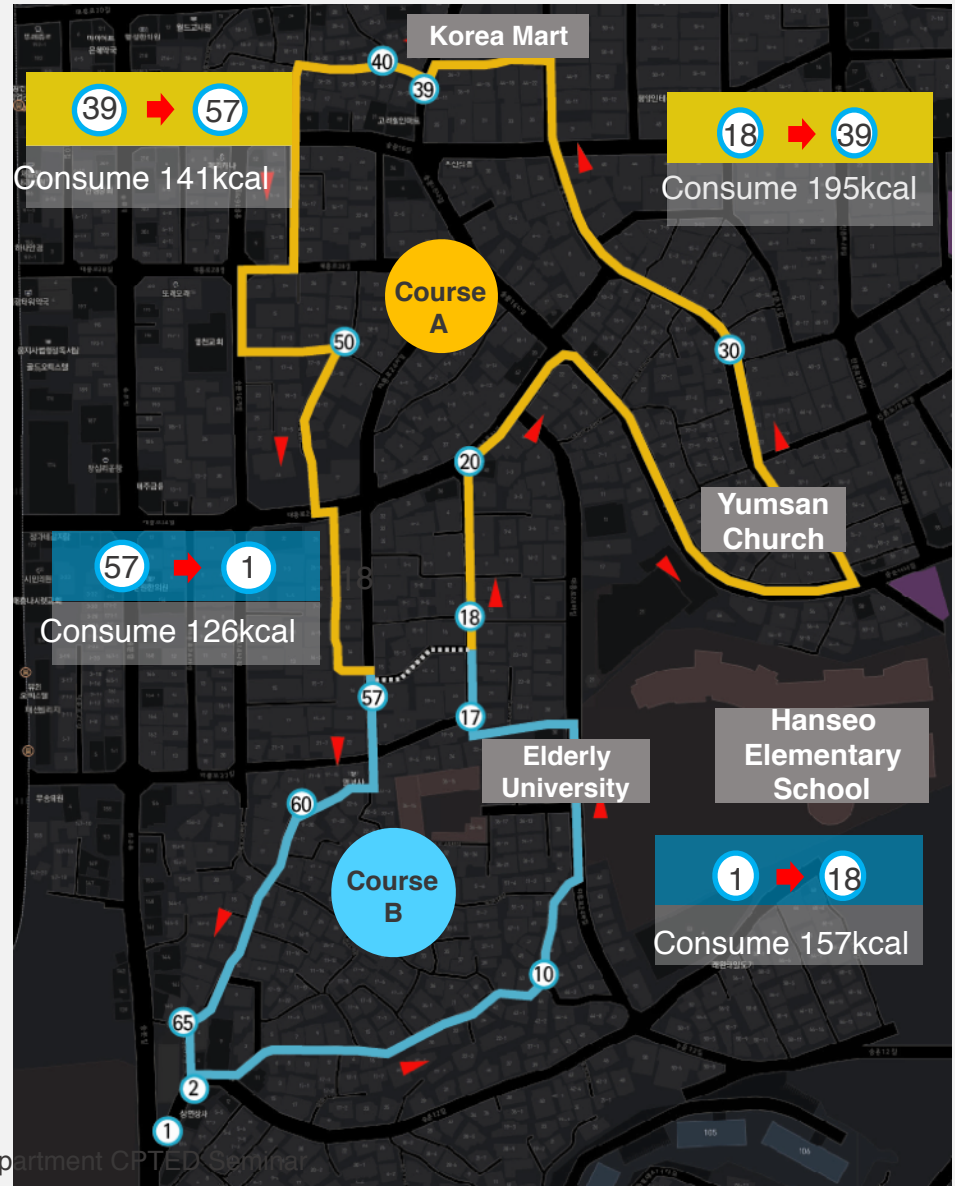
02 Slat Way

Object One

- Make Citizen Together



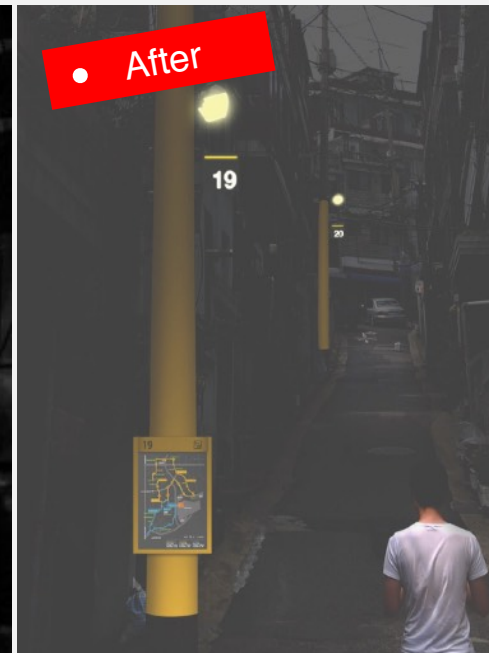
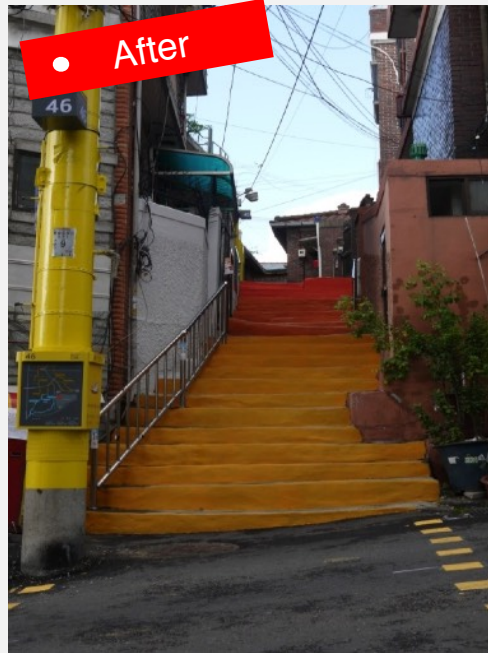
Map of Crime Fear



02 Slat Way

Object Two

- **Strengthen Territoriality**
 - Recognize location by Clear sign on Telephone pole
 - Security LED numbering



02 Slat Way

Object Three

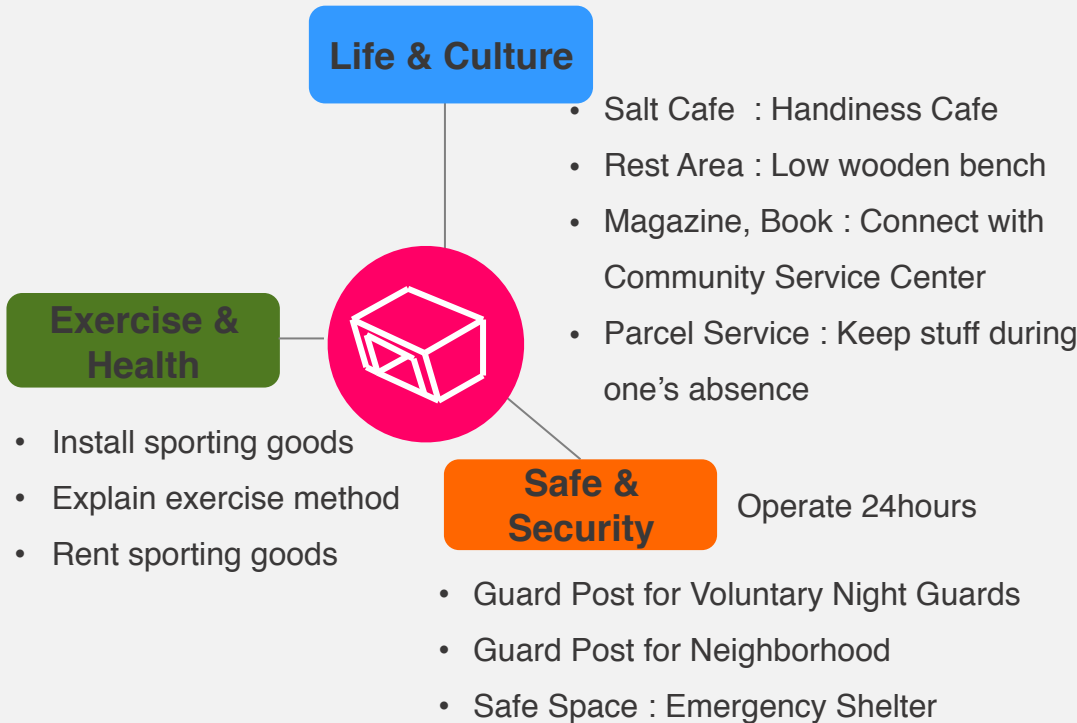
- **Detect Criminal**
 - Operate "Protection House" (6 houses)



02 Slat Way

Object Four

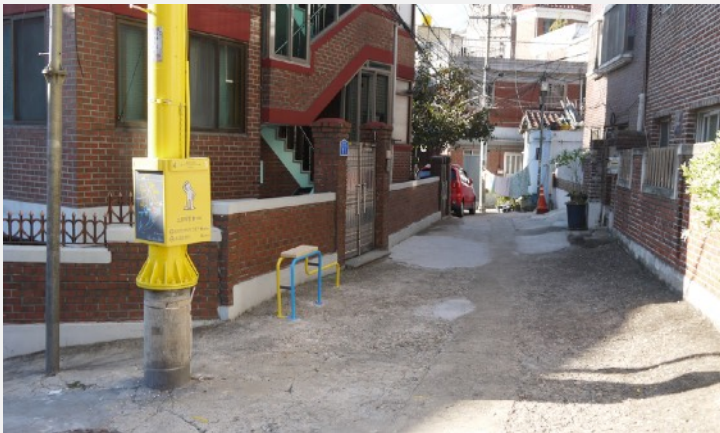
- **Lead up for Oneself**
 - Construct "Salt Dock" : Base space of resident Community



Salt Duck (Booster Station 422m²)

02 Slat Way

Seoul CPTED Project 'Salt Way'



02 Slat Way

Limitation of Slat Way : 1st Generation CPTED

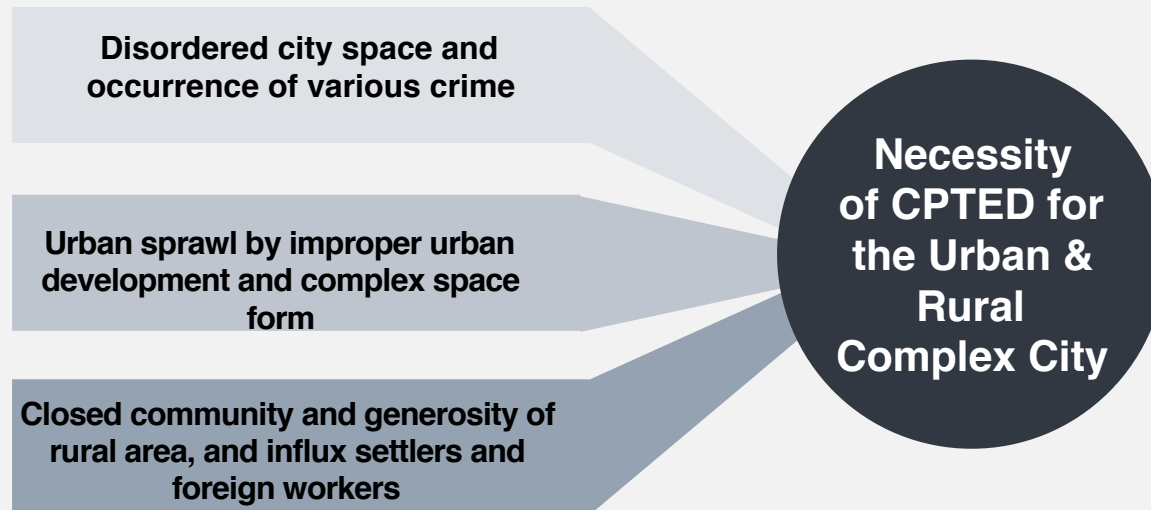
- '15.12.18. : Permission for Management and Disposal plan
- '15.12.24. : Public announcement
- '16. 3. ~ : Migration



03 Necessity of the Project

Necessity of CPTED project for the Urban & Rural Complex City

- **Former CPTED projects that was conducted mainly at urban space**
 - Former CPTED projects was conducted at **backward living space** in urban, and since then **various projects that consider space characteristics** was conducted, but most of it were **in urban area**
- **Lack of social concern for safety of crime in urban & rural complex city**
 - Social concern for safety in urban & rural complex city is insufficient in spite of various crime problem by rapid urbanization
 - When urban and rural area is combined, the city planning of the complex city usually dose not consider characteristics of rural area

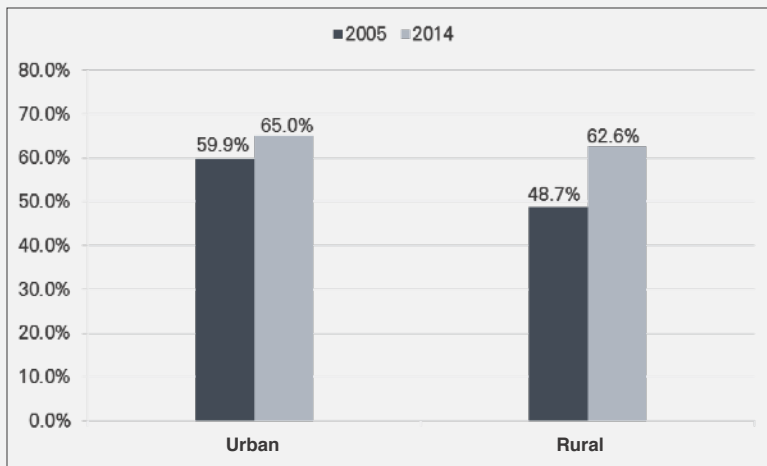


03 Necessity of the Project

Fear of Crime on Rural Area

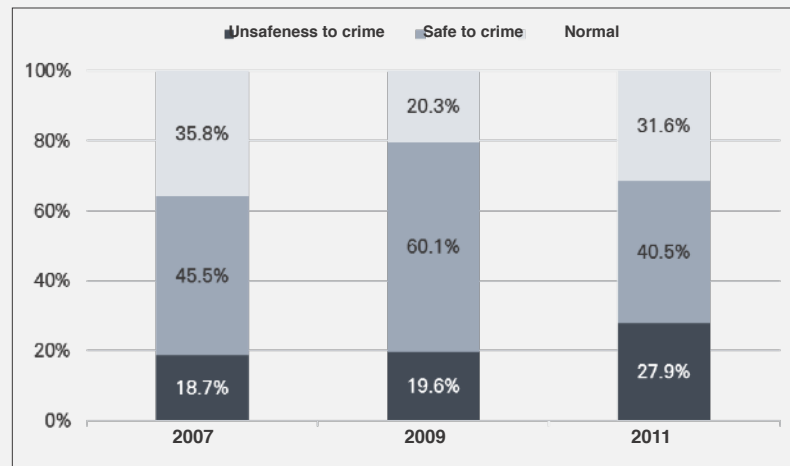
- **Fear of crime on rural area tends to increase**
 - Even though fear of crime on both urban and rural area increase, **fear of crime on rural is 2.7times more than urban**
 - According to a social survey by the National Statistical Office, rate of ‘**Unsafeness to crime**’ about ‘Do you think rural area is safe?’ was **18.7% in 2007, 19.6% in 2009, 27.9% in 2011**
- **Rural area is exposed to crime easily, and crime prevention and defense ability are remarkably lower than urban** because of its demographical characteristic
 - Exposed to crime easily due to **decrease rural population and aging that comes from the movement of population to urban**
 - Especially number of crime cases in **rural area where is adjacent urban area is high**

Fear of Crime



Source : National Statistical Office(2005, 2014), Social Survey report

Survey result about safety of crime in rural



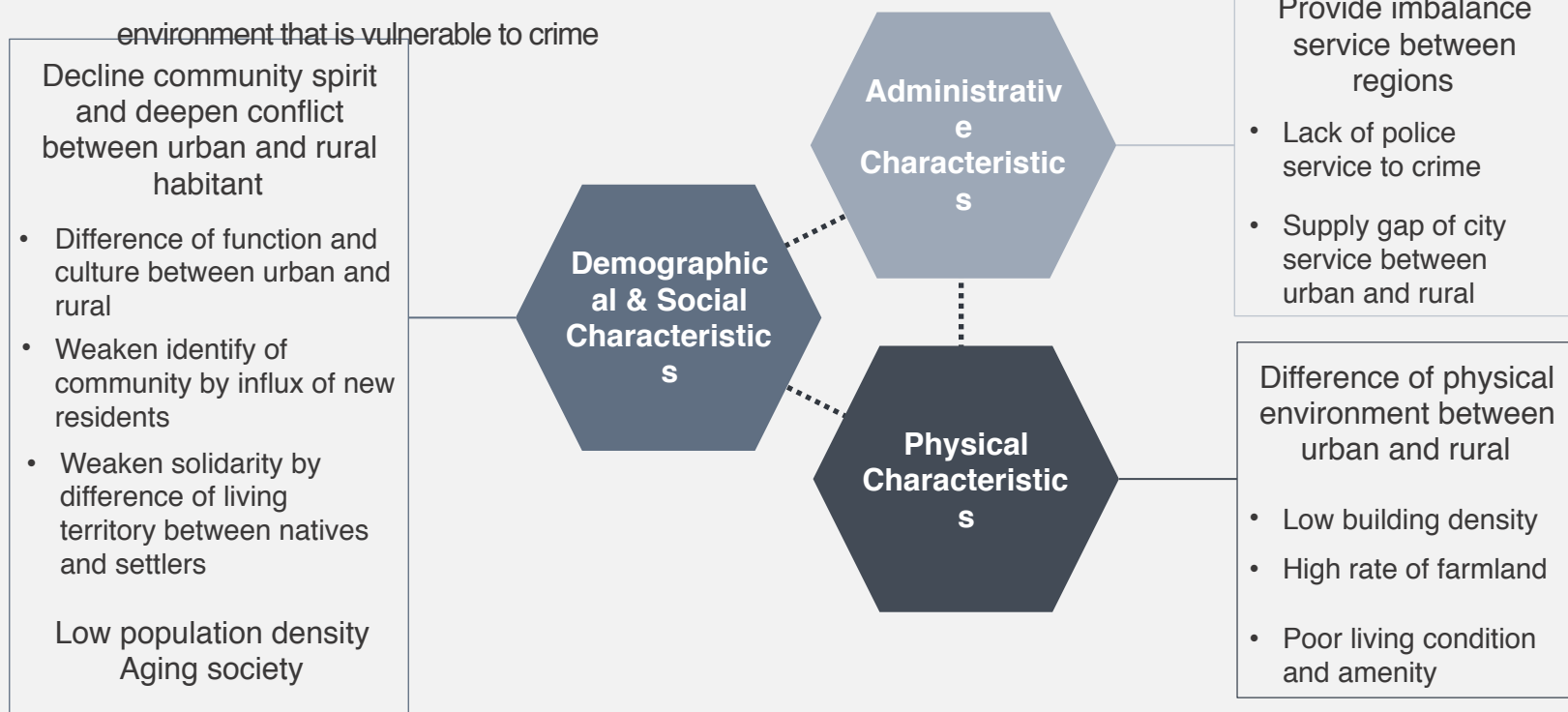
Source : Rural Development Administration(2012) , Survey of rural life index

03 Necessity of the Project

Characteristics of Urban & Rural Complex City

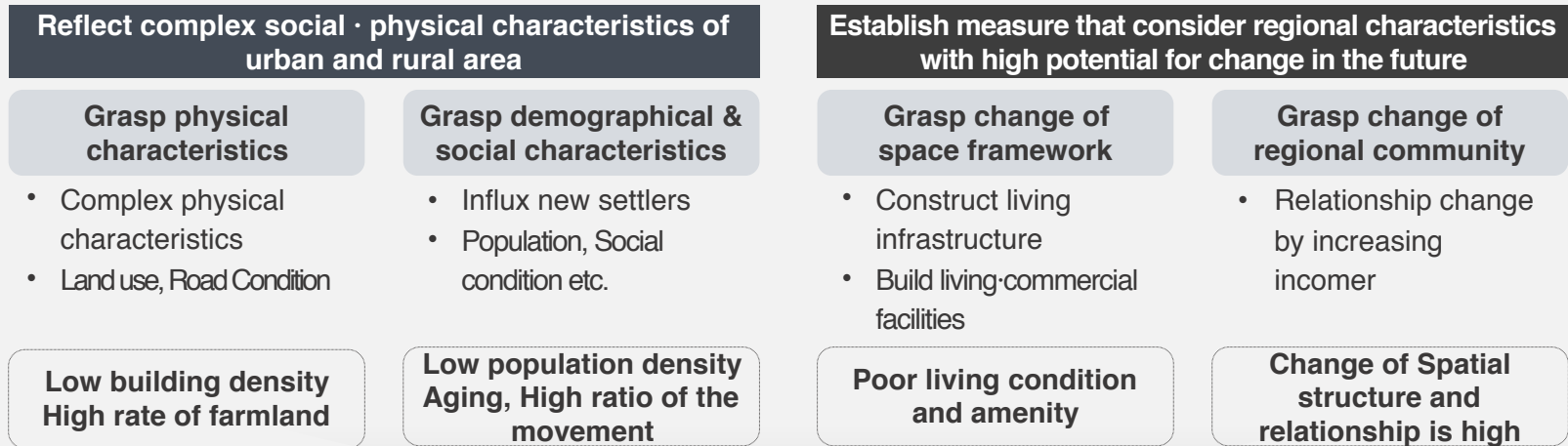
• **CPTED project is essential to solve problems caused by social · administrative · physical characteristics on urban & rural complex city**

- Through CPTED project with community, it enables enhancement a sense of unity by improving pride and attachment to region
- Especially, it enables trust recovery on administration and public realm by solving service insufficiency to crime
- Crime prevention on rural area is possible through applying customized CPTED strategies and improving physical environment that is vulnerable to crime



04 Guidance of the Project

Guidance of CPTED project for the Urban & Rural Complex City



CPTED for the Urban & Rural Complex city



2. CPTED Plan for Urban & Rural Complex City

2-1 Target Region Analysis

2-2 Vulnerable Space to Crime and Select Priority

2-3 CPTED Master Plan

01 Target Region Analysis

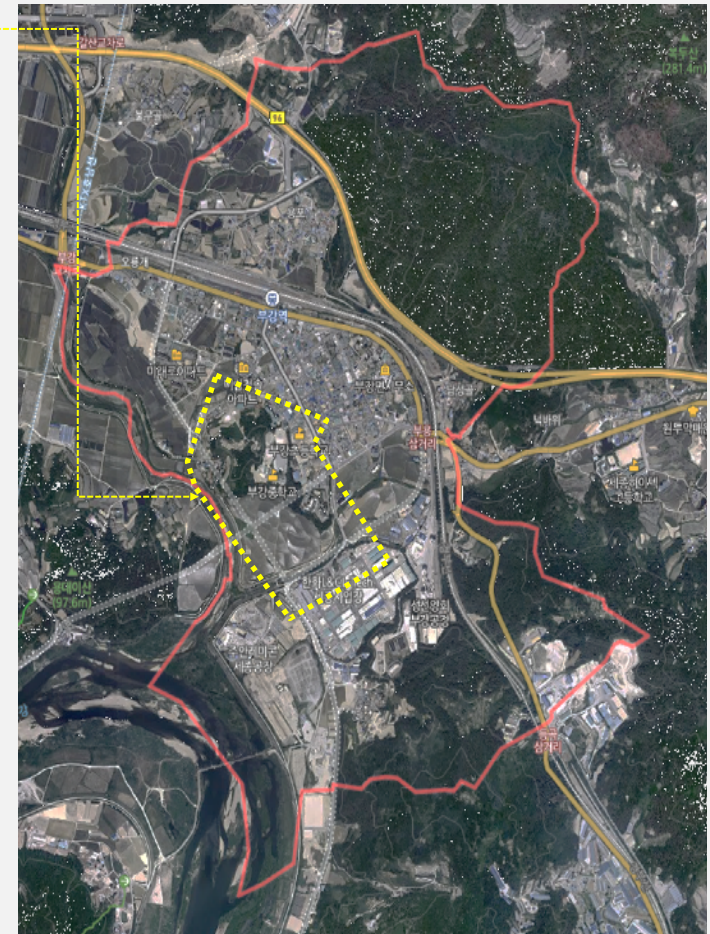
Outline of Target Region

Location Bugang-ri , Bugang-myeon, Sejong Metropolitan Autonomous City

Width About 385,000m²



- Bugang-myeon is located in south-east of Sejong City, and the target region is a center village of Bugang-myeon
- Bugang-ri consists of fifteen administrative region, and the region was incorporated into Sejong City from Chungcheongbuk-do province in 2012
- The project region is Bugang 1ri, 5ri, 10ri and 13~15ri where is a west life zone of Bugang Station



01 Target Region Analysis

Population · Social Condition

- Population by Age
 - Working age population takes 71.5%(3,303 people) of total population of the region that is higher than Sejong City and Bugang-myeon
 - It shows that the region is a **young rural center area**

Division	Sejong City		Bugang-myeon		Target region		
	Population	Rate	Population	Rate	Population	Rate	
Total	210,884	100.0%	6,699	100.0%	4,620	100.0%	
Age	Under15	42,411	20.1%	720	10.8%	601	13.0%
	15~64	146,074	69.3%	4,645	69.3%	3,303	71.5%
	Over 65	22,399	10.6%	1,334	19.9%	716	15.5%

- Elderly Population Rate and Aging Index
 - Elderly population rate of Sejong city takes 11.10%, Bugang-myeon takes 19.87%, and the target region takes 15.39% that is **higher than Sejong City**
 - Aging index of Bugang-myeon and the target region means that **the region is an aging society**

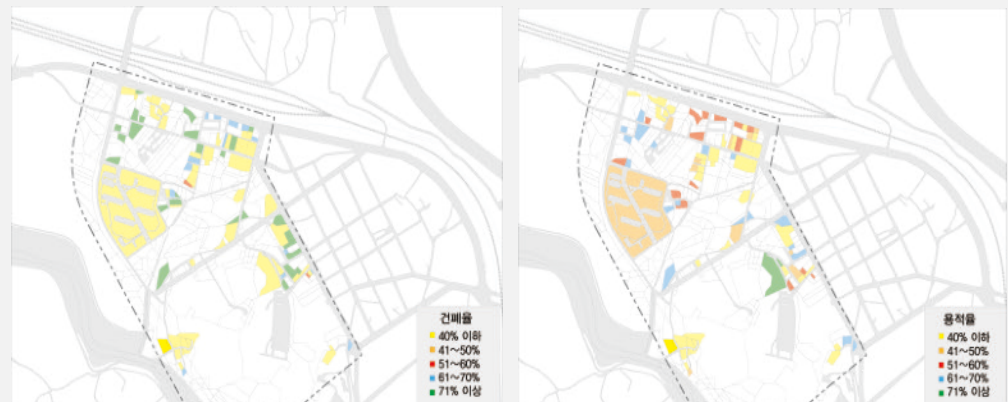
Division	Elderly Rate	Puerility Dependency Ratio	Old age Dependency Ratio	Dependency Ratio	Aging Index
Sejong City	11.10%	28.83%	16.08%	44.91%	55.79
Bugang-myeon	19.87%	15.39%	28.61%	44.00%	185.81
Target Region	15.39%	18.00%	21.47%	39.47%	119.26

01 Target Region Analysis

Physical Condition

- Zoning Code
 - **Coexistence of Urban and Rural area**
 - Productive green area, general residential area, general commercial area, general industrial area are located together
 - Bugang 1,4,5ri are included in **productive green area**, and **declined residential is formed in partial area**
 - Bugang 10,12,13,14ri are included in **general residential area**, and the region is **mixed with apartment, new house, farmland and vacant lot**

- Architecture and Major Building
 - **Building-to-land ratio** of the most architectures of the region is **under 40%**
 - It shows mostly **low floor-area ratio** because of building height restriction by military facility and cultural assets

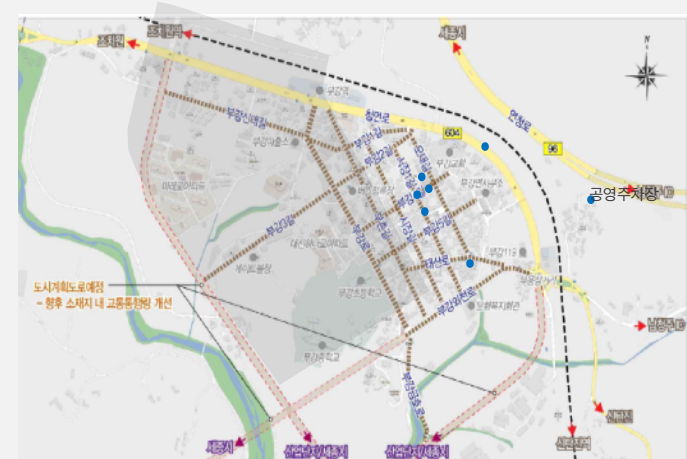


01 Target Region Analysis

Physical Condition

- Road and Parking
 - **City planning road plans for two route** that connects Chungmyeon-ro and industrial complex, and **one route** that connects Sejong city
 - Heavy vehicles that go into industrial complex use **Chungmyeon-ro**, but some vehicles use **Bugang-3gil and Bugang-ro**
 - **Bugang-3gil and Bugang-ro have high risk for accident because of illegal parking at both sides** that causes poor sight of vehicle and blind spot
 - Number of illegal parking on Bugang-3gil is **average 44 vehicles**, and heavy truck parking increase at night
 - **Public parking lot is located far away from the target region**, so it is hard to use it

- Floor of Human Traffic
 - Existing homes, new multiplex housing and commercial facilities are located in **Bugangsindae-gil** that connects to Bugang Station, and **Bugang-ro** is a boundary line between west residential area and east commercial area
 - The two roads are full of people
 - **Bugangsindae-gil and Toemi-ro** that connect to Miraero Apartment and Gukjae daycare center are also full of people

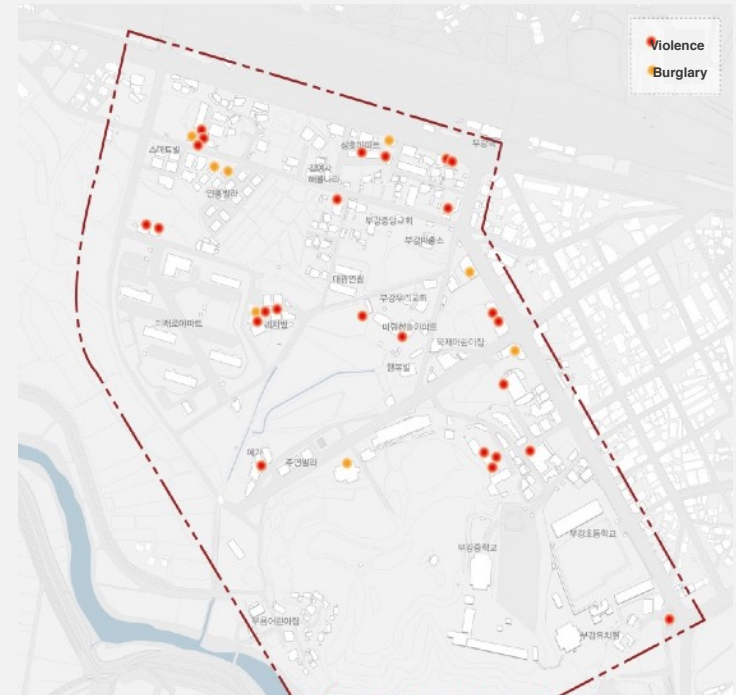
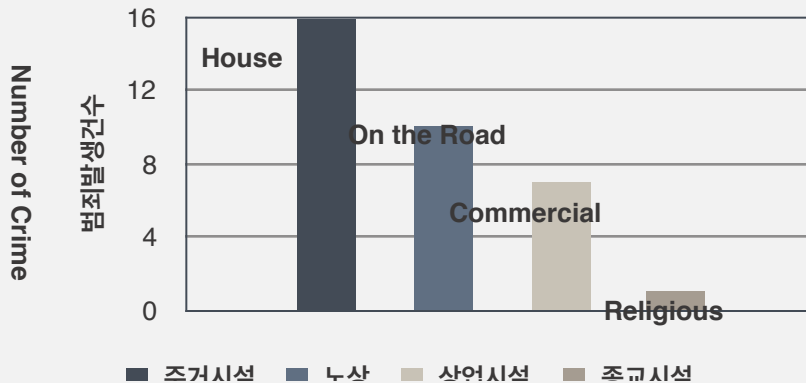


01 Target Region Analysis

Crime Occurrence Condition

- Major Crime Types are Violence and Burglary
 - Crime of the target region takes about **22% of total crime**
 - Total 34 cases: **Violence 24 cases and burglary 10 cases**
 - Major crime type is violence**
- Crime is in the order of Residential-On the Road-Commercial
 - Major crime occurrence area is a housing facility(16 cases) that is row house and multi-family housing mainly**
 - The next is on the road(10 cases) that is convenience **store, mart and in front of housing facility**
 - In commercial facility(7 cases) that is **bar and motel**

Crime Type	Bugang-ri		Target region		Total
Violence	77	64%	24	71%	101
Burglary	46	35%	10	29%	56
Pepper Incident	2	1%	-	-	2
Total	124	100%	34	100%	159



01 Target Region Analysis

Target region present condition analysis

Ambiguous boundary between fallow land and farmland



Vulnerable space to trespass from fallow land and farmland

Space that need management on bushes and trees



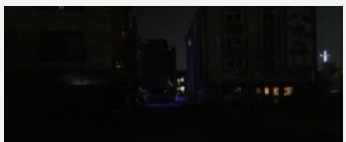
Formation of blind area and hide space

Deserted house and containers

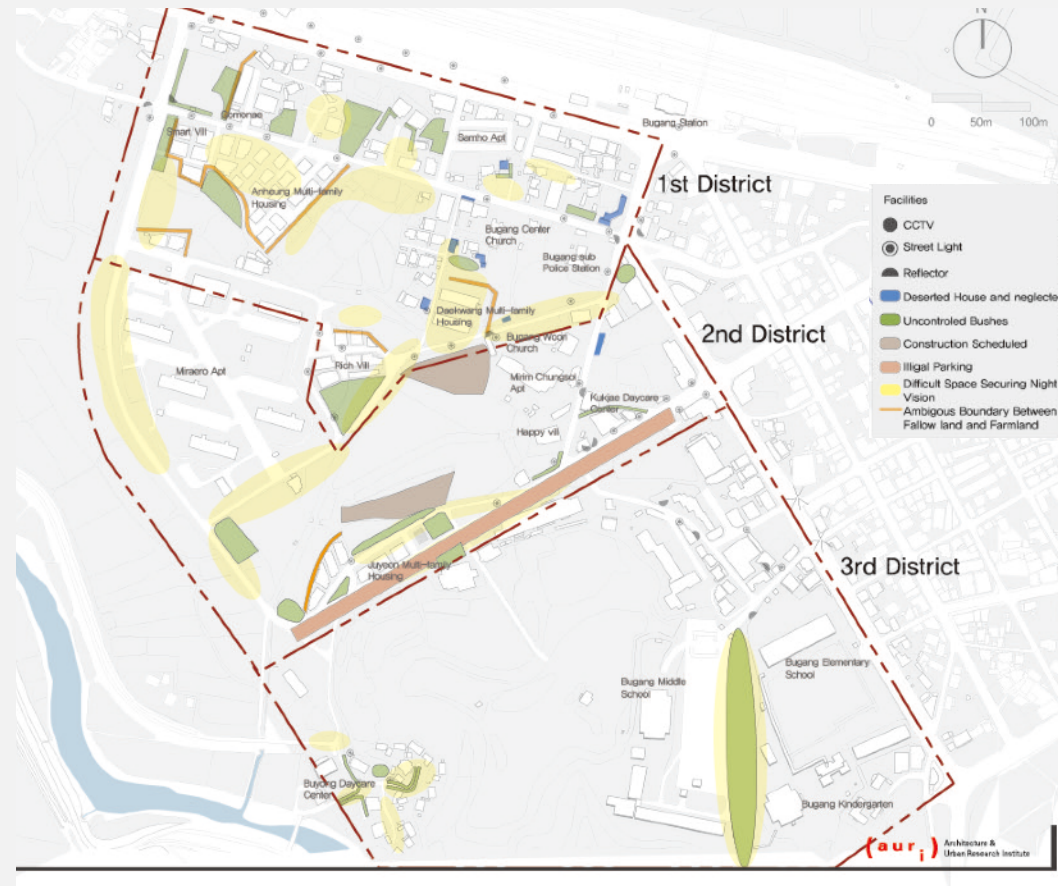


Formation of blind area and hide space
Destroying landscape

Difficult space securing night vision



Difficult space securing night vision due to lack of streetlamp





0 50m 100m

- Studio buildings are concentrated
Foreigner ratio is high
- New and existing housing, fallowland and farmland are mixed
- Street close to farm
- Unsafe walking environment at night due to lack of lights




- The region that crime rate is the highest according to GEO PROS

- Illegal parking and fear of crime is high

- Daycare center is located
- Sexual crime was occurred at near trail

- Daycare center is located
- Need to improve walking environment for children

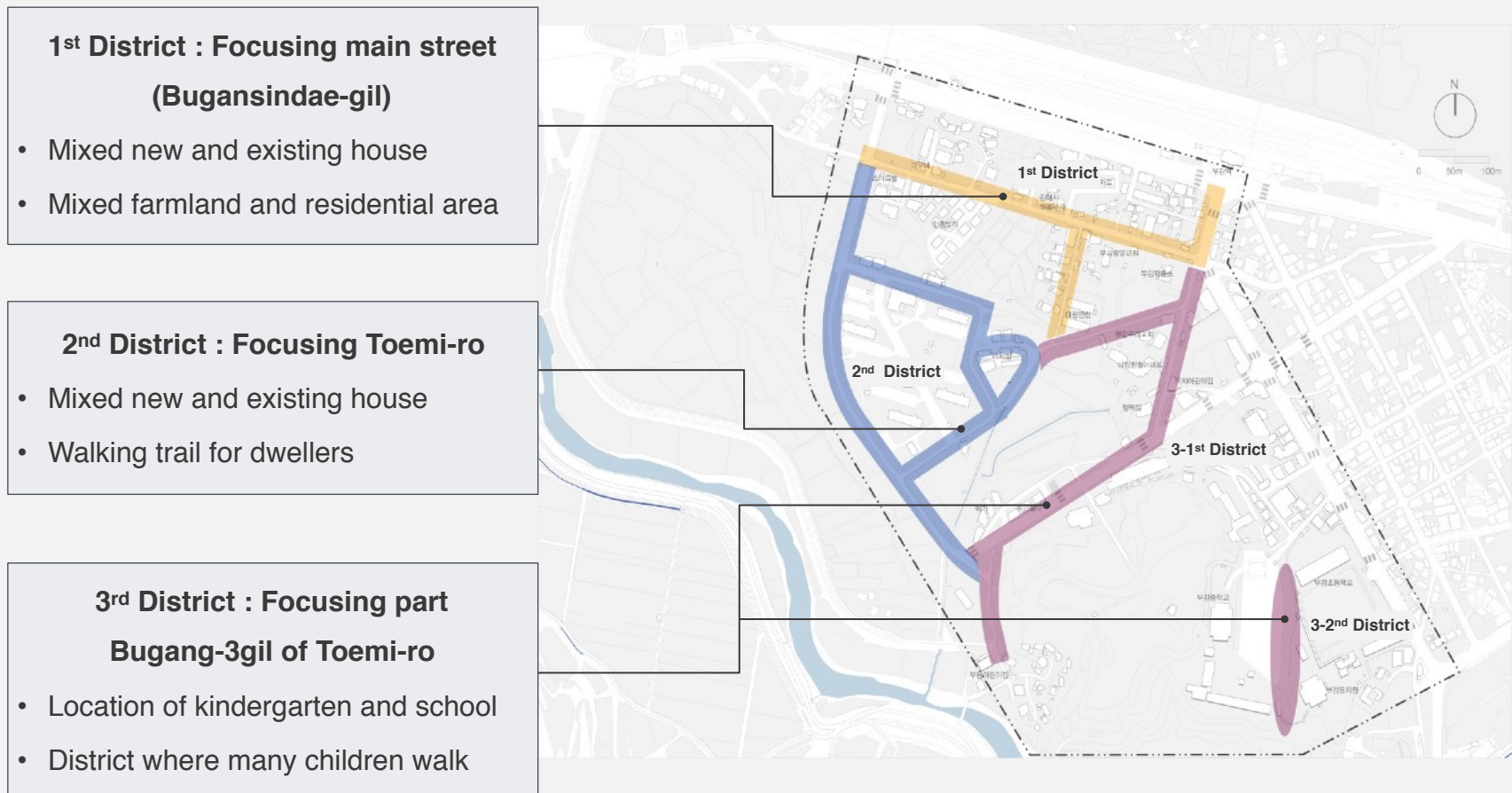
- As boundary between middle school and elementary school, there is blind spot by bushes
- Juvenile delinquents meeting place

-  High both crime rate and fear of crime
-  Hotspot by GEO PROS (2012–2015)
-  Vulnerabel space by field surveye

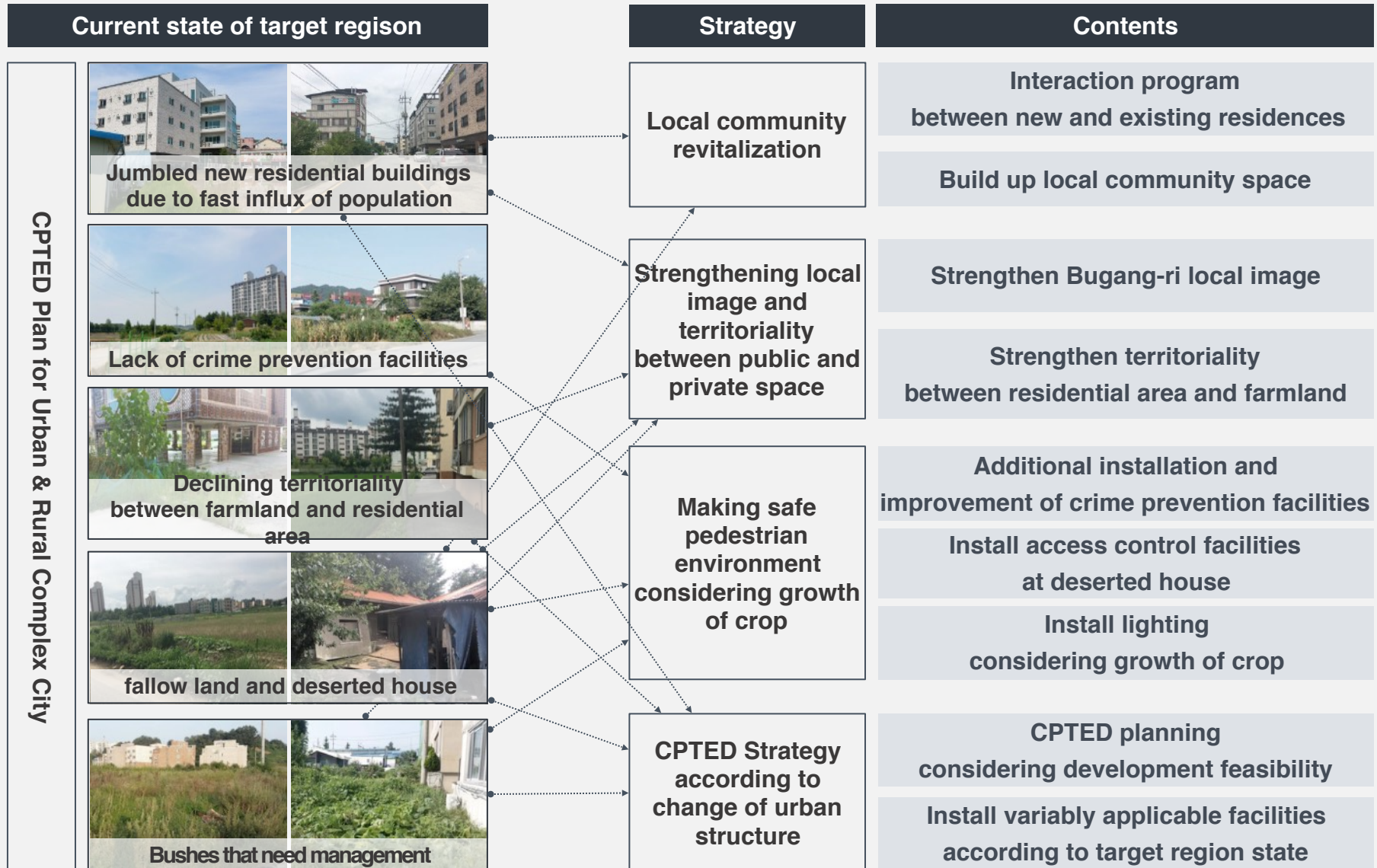
02 Vulnerable Space to Crime and Select Priority

Select Priority

- Customized CPTED plan based on condition and vulnerable to crime on target region



03 CPTED Master Plan



03 CPTED Master Plan

1st District : Build up safe street and residential environment for new and existing residents

1st strategy	Activate local community using fallow land and deserted house	Build up town square after removing deserted house
		Build up local community space using neglected buildings
		Build up garden and sharing parking lot using fallow land
2nd strategy	Strengthen territoriality and local image between farmland, fallow land and public street and residential area	Install Bugang-ri information board after removing old steel fence in front of Bugang station
		Strengthen clarity of entrance through information facility and road painting
		Install fence on the boundaries between farmland, fallow land and residential area
		Painting on the old wall
3rd strategy	Improve vulnerable space to crime and expanding crime prevention facilities considering growth of crop	Install access facility at the entrance of deserted house
		Management of bushes in garden and open space
		Install fence lighting considering growth of crop
		Install CCTV and emergency bell at the entrance of main street
		Expansion of streetlamp in internal street

1st District : Build up Safe Street and Residential Environment for New and Existing Residents

Management of bush in garden and open space

Install penetrative fence on the boundaries between farmland, fallow land and residential area
Minimize possibility of potential trespassing crime

Install fence lighting considering growth of crop
The fence light is under 5lux, and it reduces anxiety about walking at night

Install CCTV and emergency bell at the entrance of main street
Detect illegal movement of vehicle and people and call of attention by installing information facility

Install Bugang-ri information board after removing old steel fence in front of Bugang station
Strengthen regional image and territoriality of Bugang-ri

Making town square after removing deserted house
Strengthen territoriality and remove potential crime space

Strengthen clarity of entrance through information facilities and road painting
Strengthen territoriality

Install access control facility at the entrance of deserted house
Install penetrative access control facilities easy to detect

Build up local community space using neglected buildings
Connect with a plan that regional community prosecutes

Expansion of streetlamp in internal street
Install wall light in case of hard to install pillar

Painting on the old wall
Improve pedestrian environment and landscape image

Build up garden and sharing parking lot using fallow land
Satisfy residents' supply for parking lot and manage main street

Activate Regional Community using Vacant Lot and Derelict Houses

	Existing	New	Change
Rest Area	-	2	
Kitchen Garden	-	4	
Community Space	-	2	
Flower Garden	-	3	
Parking Lot	-	2	

Strengthen Territoriality and Region Image

	Existing	New	Change
Paint on Road and Wall	-	9	-
Penetrated Fence	-	7	-
Improve Steel Fence	4	-	4

Expand Security System and Improve Places Where Crime is High

	Existing	New	Change
CCTV+Information	-	3	-
Security Light (Existing)	32	26	-
Reflector (Existing)	4	5	-
Emergency Bell	-	6	-
Fence Light	-	2	-
Floor Light	-	1	-
Arrange Bush	-	7	-
Access Control Facility	-	3	-

Current Situation Existing Facilities

	Existing	New	Change
Deserted House	4	-	-
Container and Harmful Facility	3	-	-



03 CPTED Master Plan

2nd District : Strengthen pedestrian safety at night by improving street environment considering growth of crop

<p>1st strategy</p>	<p>Activae local community using fallow land and deserted house</p>	<p>Build up community using fallow land</p> <ul style="list-style-type: none"> • Build up exercise and rest space linked to the trail and garden • Build up sharing parking lot
<p>2nd strategy</p>	<p>Strengthen territoriality and local image between farmland, fallow land and public street and residential</p>	<p>Install variable fence considering development feasibility</p> <ul style="list-style-type: none"> • Install variable fence to reinforce effect to surveillance • Separation of territoriality between fallow land and road
<p>3rd strategy</p>	<p>Improve vulnerable space to crime and expanding crime prevention facilities considering growth of crop</p>	<p>Install fence lighting considering growth of crop</p> <ul style="list-style-type: none"> • Install bottom lighting and fence lighting under 5lux • Inducement of walking trail through securing night vision

2nd District : Improve Street Environment Considering Growth of Crop

Making community space using fallow land

Build up sharing parking lot to prevent vehicle crime and secure walking vision

Activate Regional Community using Vacant Lot and Derelict Houses

	Existing	New	Change
Rest Area	-	1	-
Kitchen Garden	-	1	-
Parking Lot	-	1	-

Strengthen Territoriality and Region Image

	Existing	New	Change
Penetrated Fence	-	3	-

Expand Security System and Improve Places Where Crime is High

	Existing	New	Change
CCTV+Information	-	1	-
Security Light (Existing)	14	2	-
Reflector (Existing)	-	1	-
Emergency Bell	-	1	-
Fence Light	-	1	-
Floor Light	-	2	-

Current Situation Existing Facilities

	Existing	New	Change
Deserted House	1	-	-

Making community space using fallow land

Activate using street activity of residents

Making community space using fallow land

Utilize urban and weekend farm for neighborhood and new residents

Install variable fence considering development feasibility

Divide fallowland and street to reduce dangerousness of crime

Install fence lighting considering growth of crop

To minimize crop damage, install fence light under 5lux and floor light at handrail



03 CPTED Master Plan

3rd District : Creating safe school district considering small pedestrian volume and strengthen children community activity

1st strategy	Activate local community using fallow land and deserted house	Build up children community space using neglected container box
		Expansion children facilities after removing old container box
		Build up small size flower garden and management garden
2nd strategy	Strengthen territoriality and local image between farmland, fallow land and public street and residential	Stamping or road painting at the entrance of main school districts
		Improvement old steel fence
		Install fence at the boundary between farmland and residential area
3rd strategy	Improve vulnerable space to crime and expanding crime prevention facilities considering growth of crop	Install emergency bell and CCTV for illegal parking at the entrance of main street
		Expansion of streetlamp at the main school districts
		Install access control facilities at the deserted house surrounding kindergarten

3rd District : Creating Safe School Walkways and Strengthen Children Community Activity



Activate Regional Community using Vacant Lot and Derelict Houses

	Existing	New	Change
Rest Area	-	3	-
Kitchen Garden	-	1	-
Community Space	-	1	-
Flower Garden	-	4	-

Strengthen Territoriality and Region Image

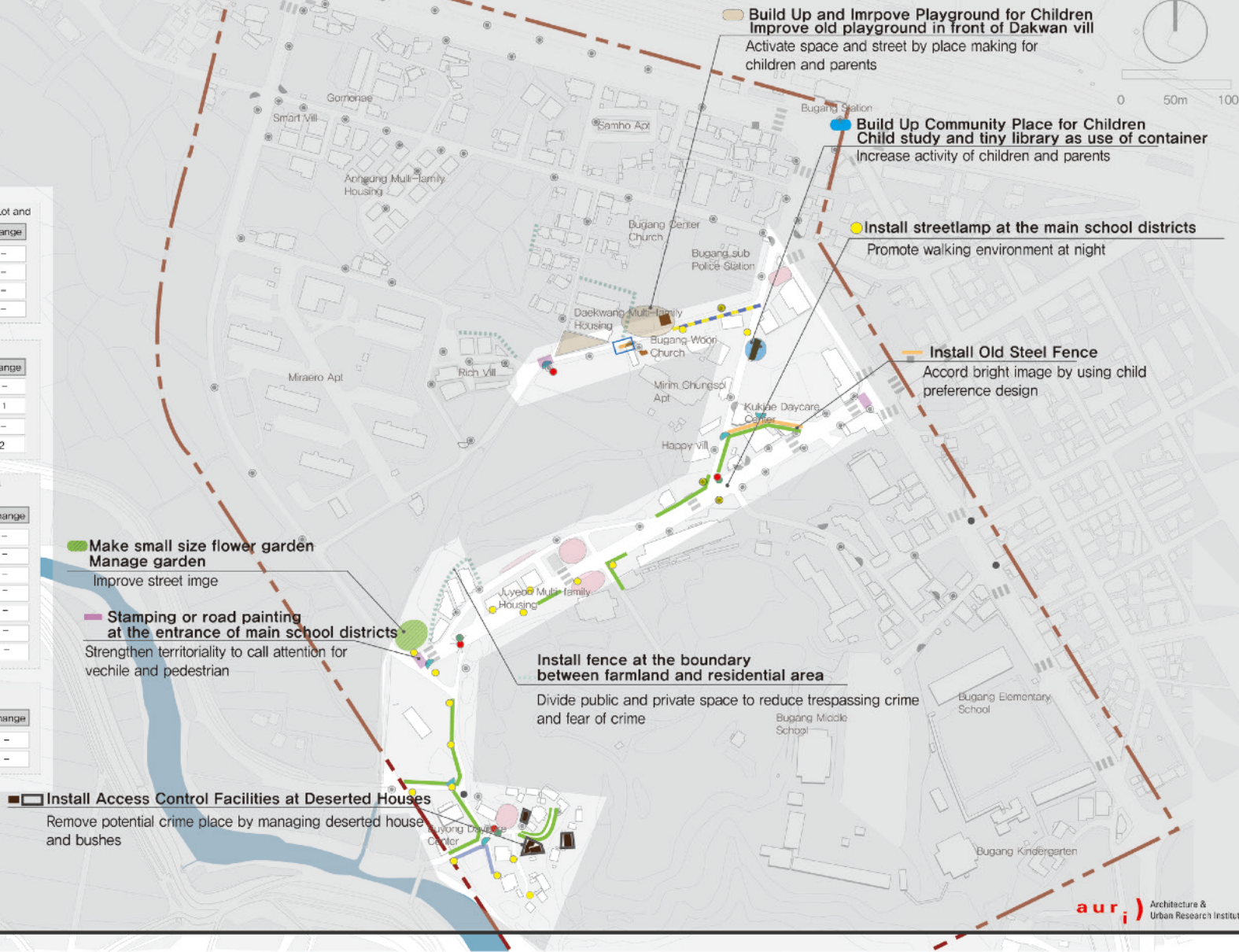
	Existing	New	Change
Paint on Road and Wall	-	2	-
Penetrated Fence	1	-	1
Improve Steel Fence	-	2	-
Remove Trash Bin Install Trash Bin	2	-	2

Expand Security System and improve Places Where Crime is High

	Existing	New	Change
CCTV-Information	1	4	-
Security Light (Existing)	30	21	-
Reflector (Exis)	5	5	-
Emergency Bell	-	4	-
Fence Light	-	1	-
Arrange Bush	-	8	-
Access Control Facility	-	3	-

Current Situation Existing Facilities

	Existing	New	Change
Deserted House	7	-	-
Container and Harmful Facility	5	-	-



03 CPTED Master Plan

Software Program : Community Program

- Leading to community participation to the CPTED and strengthen local community

Patrol Program on Harvest Season



Landscaping Management



Gardening Program



Garden Rental and Sales Program



Supporting Bicycle Patrol Program



Making Flower Garden

Change vacant lot to garden



Making Kitchen Garden

Change vacant lot to kitchen garden



Paint on Road and Wall, Install Information facilities

Specify CPTED applying region at main entrance
Notify current location, main point and length



Strengthen Territoriality between Farmland and Residential Area

Install penetration fence



Fence, Floor and Motion Dectec Lighting



- CCTV + Information
- Security Light
- Emergency Bell
- Bottom Light
- Fence Light
- Reflector
- Arrangement of Bushes
- Making Kitchen Garden
- Making Flower Garden
- Build Up Parking Lot
- Build Up Rest Area for Resident
- Build Up Community Space
- Improve Steel Fence
- Paint on Road and Wall
- Penetrating Fence
- Remove Trash and Install Wastebasket
- Install Access Control Facility
- Existing Reflector
- Existing Streetlamp
- ▲ Community Space
- Bus Station
- Deserted House
- Container and Harmful Facility

Build Up Parking Lot



Install Access Control Facilities at Deserted Houses



Paint on Wall and Improve Worn Out Wall

Intall Old Steel Fence

Introduce Hitory and Culture etc.
Infrom Main Point
Explain CPTED Project



Making Community Workplace

Build Up Town Square

If not intall acces control facility or make garden

Build Up and Improve Playground for Children

Improve old playground in front of Dakwan vill

Build Up Community Place for Children

Child study and tiny library as use of container



Reform Recyclig Bin and Information Facility

Intall United Crime Prevention Facilities

CCTV that can shoot at night and 360 degree
Intall emergency bell with warning light
Intall infomation facility that can be recognized at night



Build Up Rest Area for Residents



Build Up Rest Area and Arrange Bushes between School and Boundary



3. Evaluation CPTED for Urban & Rural Complex City

3-1 Project Outcome

3-2 Comparative Analysis of Survey

3-3 Henceforth Tasks

01 Project Outcome

Install CCTV



• Install new CCTV

- Install mainly on heavy volume of traffic
- Decline pedestrian anxiety and arouse consciousness by installing CCTV information board that is identified at night



Install minimum CCTV due to low population density

Install Security Light and Logo Light



• Install security light (15 points), security + logo light(11 points)

- Install all minimum spots considering location and direction of fence light to prevent crop damage
- Improve pedestrian environment at night by installing logo light on main node and place that fear of crime is high



Install light that under 5lux to prevent crop damage

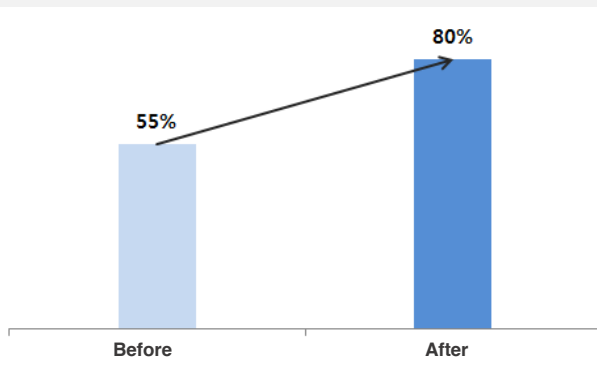
Construction plan in 2017

- Variable fence, Access control facilities, Sharing parking lot will be constructed in 2017

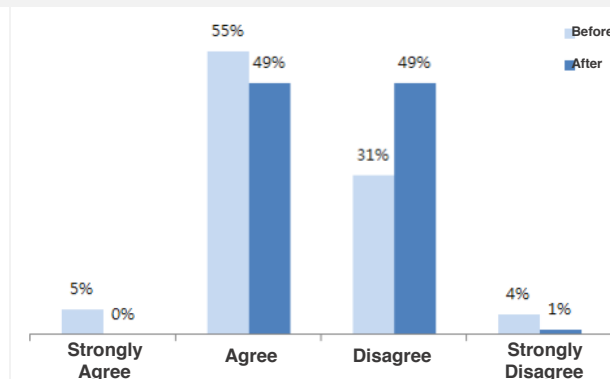
02 Comparative Analysis of Survey

Satisfaction on Residence and Regional Environment

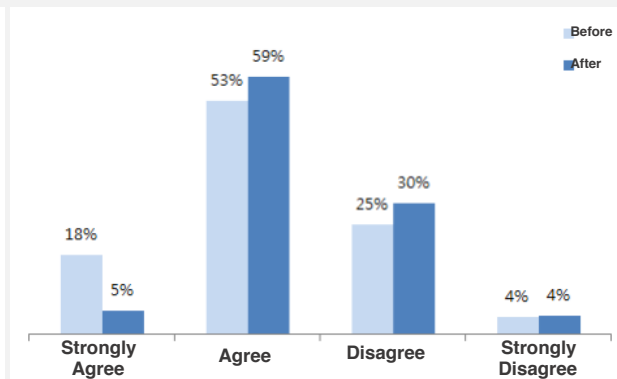
- **(Overall satisfaction on residence)** Satisfaction on residence increase highly from **55%(before)** to **80%(after)**, it means the CPTED project has a good effect on residence satisfaction for residents
- Also, it has good effect on rising safety at night street and decline interpersonal anxiety
- **(Evaluation on surrounding)** Answer rate that street is dirty **decrease 11%**, and answer rate that street is too dark at night **decrease 7%** compare to before CPTED project that means physical environment where is weak to crime is improved



[Overall Satisfaction on residence]



[Street is Dirty due to Waste, Filth and Scribble]

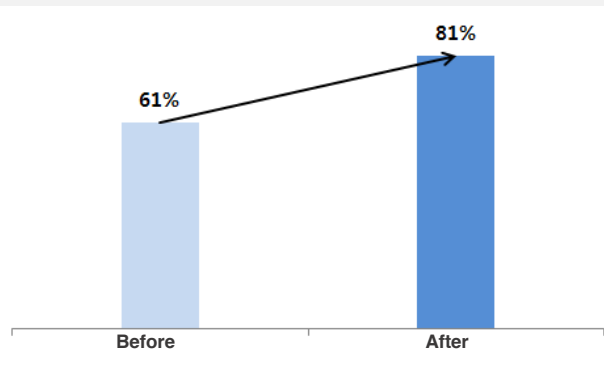


[Street is too Dark at Night]

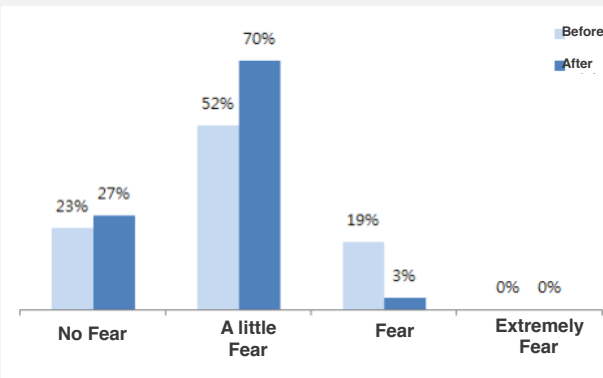
02 Comparative Analysis of Survey

Fear of Crime

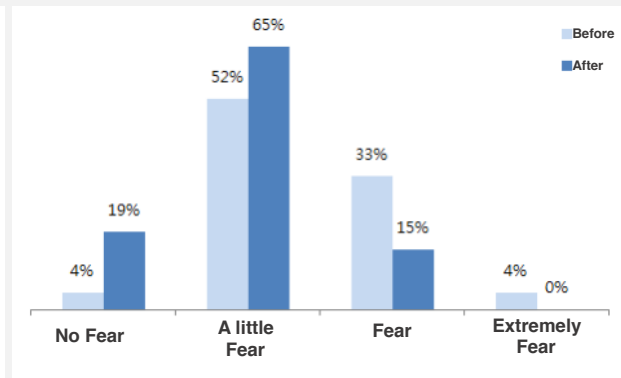
- **(Safety degree to Crime)** Answer rate that residence feel safe to various crime is changed from **61% (before)** to **81%(after)** that means environment that residents feel safe is built up
- **(Fear degree to Expected Crime)** Answer rate that **'be not fearful of'** in walking on the day and the night increase **each 22%(day) and 28%(night)** that means fear to crime decrease through



[Safety degree to Crime]



[Fear degree at walking on the day alone]

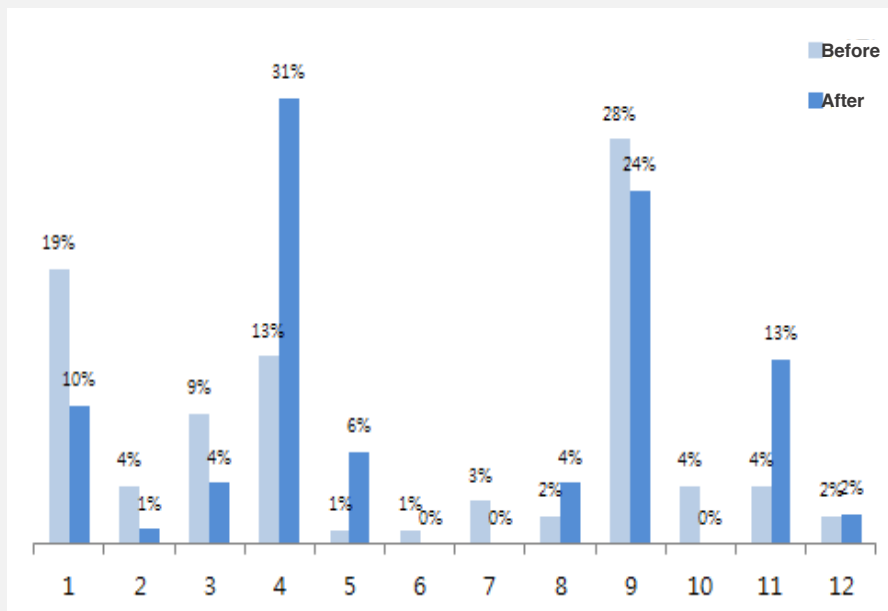


[Fear degree at walking on the night alone]

02 Comparative Analysis of Survey

Action and Activity for Crime Prevention

- **(Crime prevention measure for regional safety)** The order is **'Strengthen police patrol'(31%)**, **'Install CCTV'(24%)**, **'Strengthen voluntary crime prevention activity'(10%)**, and the survey result shows that **'the role of surveillant is important'** for residents
- Above factors are recognized that reduce fear to crime and effective to prevent crime highly



[Crime prevention measure for regional safety]

Action and activity measure for crime prevention

- ① Strengthen voluntary crime prevention activity by resident
- ② Operate education and participation program for crime prevention
- ③ Keep street be neat and clean
- ④ Strengthen police patrol on street and public space
- ⑤ Install emergency ball on street and public space
- ⑥ Improve surrounding through design on street and public space
- ⑦ Increase community involvement in environmental improvement and region development
- ⑧ Reorganize detrimental establishment and surroundings in region
- ⑨ Install CCTV on public space
- ⑩ Provide sport and leisure facilities for youth
- ⑪ Maintain street light be brightly
- ⑫ Install police anticrime checkpoint

03 Henceforth Tasks

Henceforth Tasks of CPTED for the Urban & Rural Complex City

1

Activate Neighborhood Community

- Long-term CPTED planning that reflects opinions of residents and interested parties
- Strengthen project effect in parallel with education and PR programs
- Strengthen self-response ability to crime and build trust neighborly through activate community

2

Develop Design Solutions

- Design solution that reflects both regional characteristics and building type
- Develop CPTED guideline and design solutions for each unit to support project practitioners
- Promote CPTED project by providing it to central and local government

3

Management and Monitoring

- Plan maintenance measure for CPTED facilities
- Continuous analysis about outcome through monitoring
- Carry out survey systematically in the long-term

(auri)

Thank You