



Promoting research excellence in nature-based solutions for innovation, sustainable economic growth and human well-being in Malta.

Instruments for NbS design

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Policy instruments to promote and design NbS in urban plans

*(Implementation-oriented) **Policy instruments in urban plans represent the legal instruments provided to implement the plan's actions.***

Degree of coerciveness continuum

more coercive
(regulatory and command-and-control)

less coercive
(information-based and voluntary)

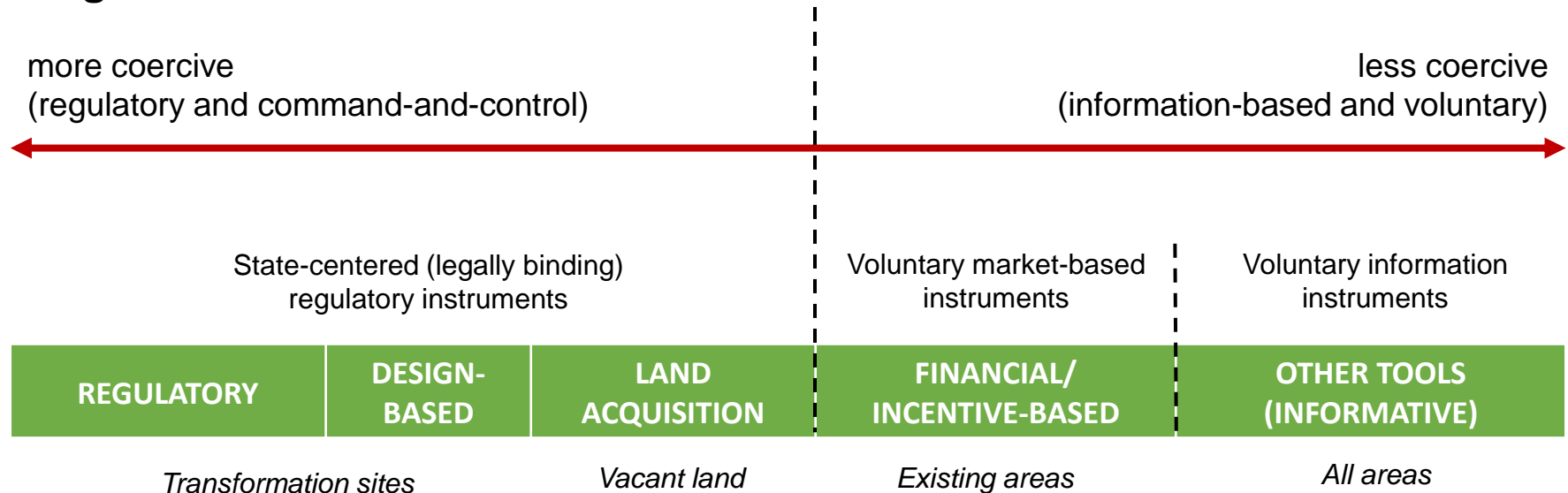


Vedung, 1998

Policy instruments to promote and design NbS in urban plans

*(Implementation-oriented) **Policy instruments in urban plans represent the legal instruments provided to implement the plan's actions.***

Degree of coerciveness continuum



Elaboration from categories by Cortinovis and Geneletti, 2018

Policy instruments to promote and design NbS in urban plans

REGULATORY	DESIGN-BASED	LAND ACQUISITION	FINANCIAL/ INCENTIVE-BASED	OTHER TOOLS (INFORMATIVE)
Quantitative targets or standards	Ad hoc design solutions for specific site development	Fee (simple) acquisition programs	Preferential tax treatments	Guidelines or criteria for public space design
Technological requirements		Development rights acquisition programs	Subsidies/ grants	Principles for territorial management
Compensation measures			Density bonuses	Promotion of good practices
Performance-based (zoning) approaches			Financial bonds	
Conservation zones or protected areas			Transfer of development rights	
Other regulatory tools related to zoning				

Elaboration from categories by Cortinovis and Geneletti, 2018

Regulatory instruments

REGULATORY

Quantitative targets or standards

Technological requirements

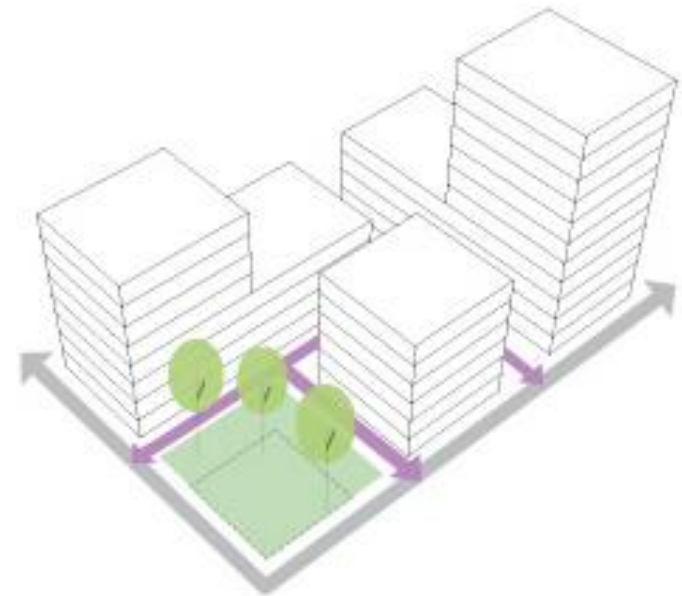
Compensation measures

Performance-based (zoning) approaches

Conservation zones or protected areas

Other regulatory tools related to zoning

Definition of quantitative targets or standards that must be met when developing or redeveloping an area



Example
Share of available and accessible green spaces

<https://participate.melbourne.vic.gov.au>

Regulatory instruments

REGULATORY

Quantitative targets
or standards

**Technological
requirements**

Compensation
measures

Performance-based
(zoning) approaches

Conservation zones
or protected areas

Other regulatory
tools related to
zoning

Definition of specific technological requirements that must be met when developing or redeveloping an area

Example

All buildings of a certain type (e.g., commercial and public) must green all or part of their roof



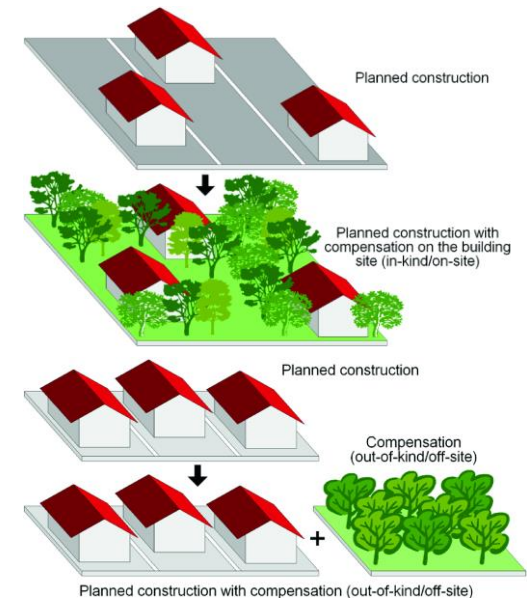
<https://www.portlandoregon.gov>

Regulatory instruments

REGULATORY
Quantitative targets or standards
Technological requirements
Compensation measures
Performance-based (zoning) approaches
Conservation zones or protected areas
Other regulatory tools related to zoning

Definition of mandatory (on-site or off-site) compensation measures to include when developing or redeveloping an area

Example
Mandatory (re)planting of trees (if harvested)



Kravchenko, 2019

Regulatory instruments

REGULATORY

Quantitative targets
or standards

Technological
requirements

Compensation
measures

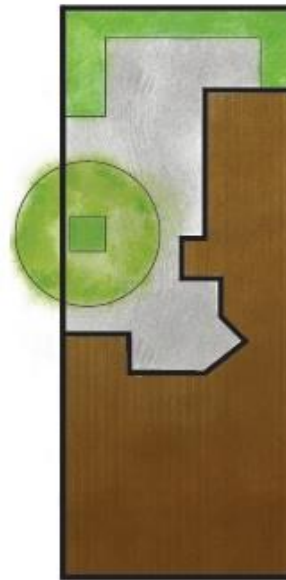
**Performance-based
(zoning) approaches**

Conservation zones
or protected areas

Other regulatory
tools related to
zoning

Definition of minimum performance score to meet when developing or redeveloping an area in order to limit development impacts by attaining desired levels of green and blue surfaces that contribute to the final score

Example
*Biotope area factor
(developed in Berlin)*



Calculation: BAF inventory

Total land area: 479 m²

Developed area: 279 m²

Undeveloped area: 200 m²

Degree of development: 0.59

The courtyard is mainly covered with asphalt. There is gravel with grass coverage on the periphery, and the tree stands in a soil bed that measures 1 m²

140 m² Asphalt $\times 0.0 = 0 \text{ m}^2$

59 m² gravel with grass coverage $\times 0.5 = 30 \text{ m}^2$

1 m² open soil $\times 1.0 = 1 \text{ m}^2$

BAF = $31/479 = 0.06$

BAF target = 0.3

Naumann et al., 2020

Regulatory instruments

REGULATORY

Quantitative targets
or standards

Technological
requirements

Compensation
measures

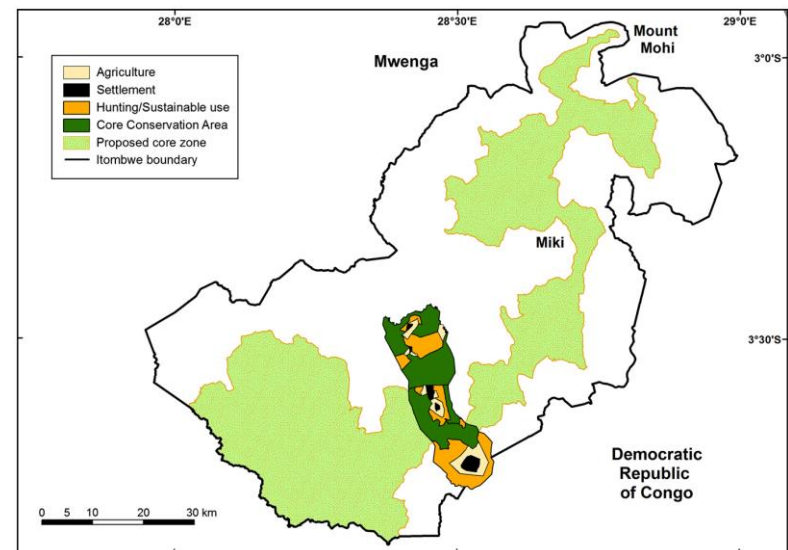
Performance-based
(zoning) approaches

**Conservation zones
or protected areas**

Other regulatory
tools related to
zoning

Definition of boundaries for conservation zones or protected areas, and rules (restrictions and limitations) that must be respected within them

Example
*Zoning boundaries
with different degrees
of protection*



Kujirakwinja et al., 2019

Regulatory instruments

REGULATORY

Quantitative targets
or standards

Technological
requirements

Compensation
measures

Performance-based
(zoning) approaches

Conservation zones
or protected areas

**Other regulatory
tools related to
zoning**

All the other types of actions undertaken through zoning regulations (e.g. density regulations, permitted and forbidden uses related to zoning, etc.)

Example
*Cluster development
zoning*



<https://www.chescoplanning.org>

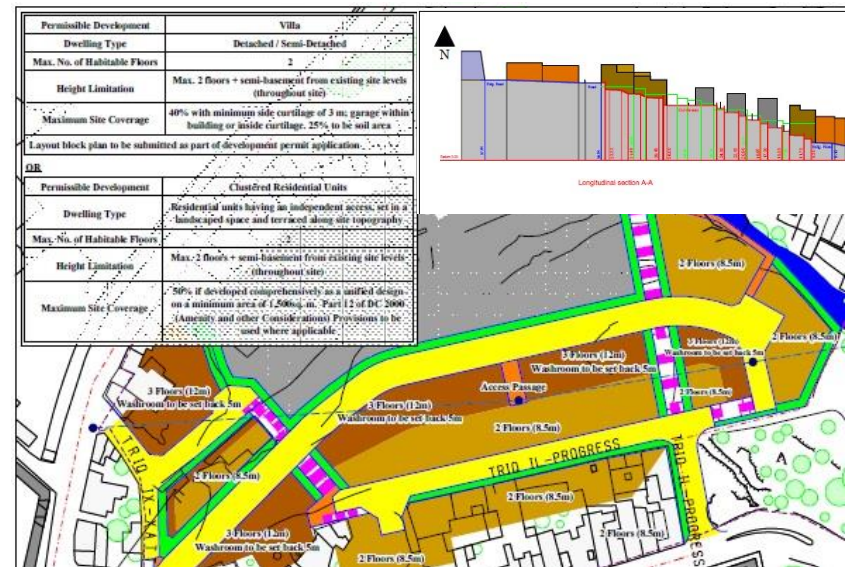
Design-based instruments

DESIGN-BASED

Ad hoc design solutions for specific site development

Definition of detailed design solutions (and rules) for specific areas to implement either in public projects or in privately-lead urban developments

Example
Detailed zoning scheme with site specific dimensional and architectural parameters



Malta Environment and Planning Authority, 2002

Land acquisition programs

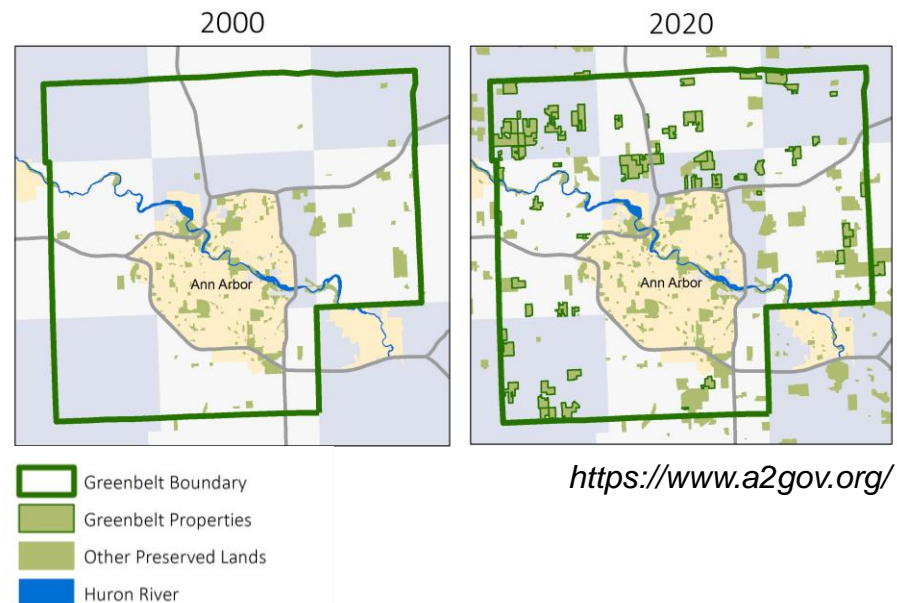
LAND ACQUISITION

Fee (simple)
acquisition programs

Development rights
acquisition programs

The public simply buys the land from the owners to prevent development, OR the public pays landowners to forgo certain land development rights, documenting the transfer of those development rights to the government

Example
*Land acquisition
for developing
city greenbelt*



Financial & incentive-based instruments

FINANCIAL/ INCENTIVE-BASED

Preferential tax treatments

Subsidies/
grants

Density bonuses

Financial bonds

Transfer of
development rights

Definition of tax incentives and fee reductions under certain circumstances

Example
*Imperviousness
fee*



Naumann et al., 2020

Financial & incentive-based instruments

FINANCIAL/ INCENTIVE-BASED

Preferential tax
treatments

**Subsidies/
grants**

Density bonuses

Financial bonds

Transfer of
development rights

(Direct) Subsidies/grants as payment for delivering the public benefits of the private investment attached to private properties

Example
*Green roof subsidy
programme*



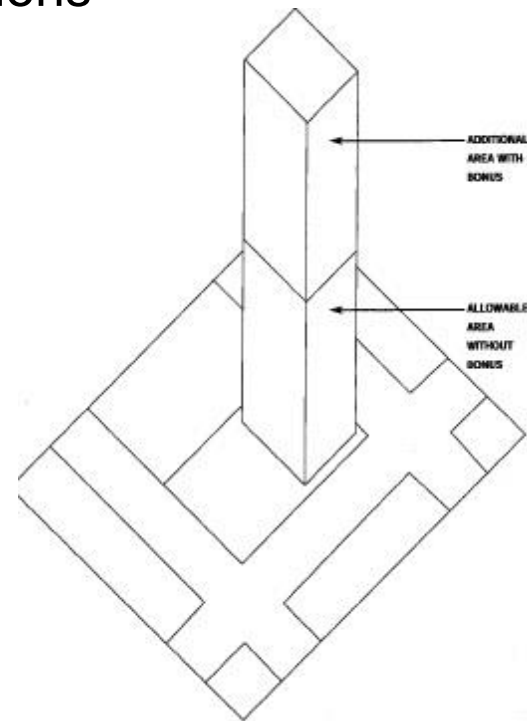
Naumann et al., 2020

Financial & incentive-based instruments

FINANCIAL/ INCENTIVE-BASED
Preferential tax treatments
Subsidies/ grants
Density bonuses
Financial bonds
Transfer of development rights

Increase in the surface/volume allowed in the area in change of specific conditions

Example
Density bonus in change of public open spaces and parks provision



Morris, 2000

Financial & incentive-based instruments

FINANCIAL/ INCENTIVE-BASED

Preferential tax
treatments

Subsidies/
grants

Density bonuses

Financial bonds

Transfer of
development rights

Loans made by an investor to a borrower (typically corporate or governmental, e.g. municipalities) to finance projects and operations, in this case intended exclusively for investment in sustainable projects

Example

*Green bonds to finance
sustainability projects*



Smart Cities Council, 2015

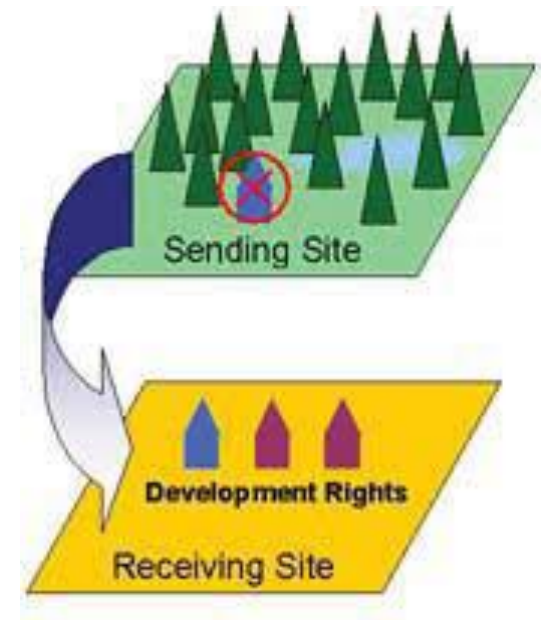
Financial & incentive-based instruments

FINANCIAL/ INCENTIVE-BASED
Preferential tax treatments
Subsidies/ grants
Density bonuses
Financial bonds
Transfer of development rights

Giving rights to build in another area or to sell the development rights in change of the preservation from development of the original area

Example

Transfer of development rights to preserve farmland and areas of ecological value



<https://depts.washington.edu>

Information instruments

OTHER TOOLS (INFORMATIVE)

**Guidelines or
criteria for public
space design**

Principles for
territorial
management

Promotion of good
practices

Definition of design principles, guidelines, or criteria that should be applied when realizing public spaces

Example

Using design principles and criteria for improving the public realm, including open spaces and parks (e.g., though landscaping elements).



<https://minneapolis2040.com>

Information instruments

OTHER TOOLS (INFORMATIVE)

Guidelines or criteria
for public space
design

**Principles for
territorial
management**

Promotion of good
practices

Commitment in administrative processes, such as the definition of a checklist of criteria for assessing projects during the planning process, or in the implementation of future planning documents

Example
*Commitment in the
implementation of future
afforestation programmes*



<https://www.newscientist.com>

Information instruments

OTHER TOOLS (INFORMATIVE)

Guidelines or criteria
for public space
design

Principles for
territorial
management

**Promotion of good
practices**

Suggestion of principles, best practices and techniques to apply in private areas

Example

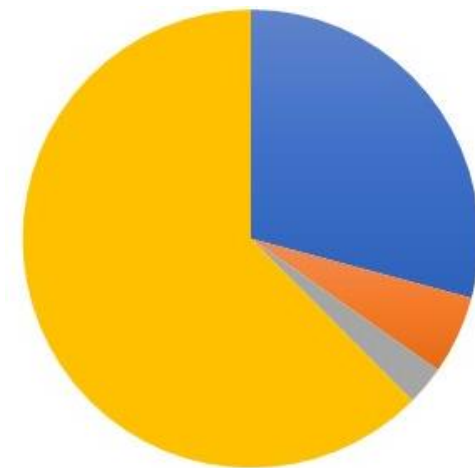
Suggestion of measures to put in place to screen industrial estate (e.g., through tree planting and other landscaping elements)



<https://www.caruso-torricella-architetti.com>

Case study: North Harbours and Grand Harbour Local Plans, Malta

Content analysis of North Harbours Local Plan and Grand Harbour Local Plan's policies promoting NbS



■ Regulatory tools
 ■ Land acquisition programs
■ Design-based tools
 ■ Other tools
■ Incentive-based tool:

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Elaboration by the authors starting from categories by Cortinovis and Geneletti, 2018

Case study: North Harbours and Grand Harbour Local Plans, Malta

TYOLOGY	SPECIFIC INSTRUMENT	EXAMPLES FROM MALTA LOCAL PLANS
Regulatory instruments	Quantitative targets or standards	A portion of development site (identified as a minimum share of the site area) to retain as landscaped open space
	Technological requirements	Inclusion of effective landscaped buffering to protect any surrounding residential uses from undesired uses
	Compensation measures	-
	Performance-based zoning	-
	Conservation zones or protected areas	Designation of protected garden and tree areas to maintain as open (semi)natural space



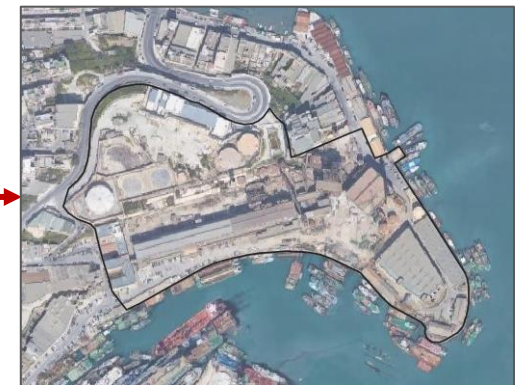
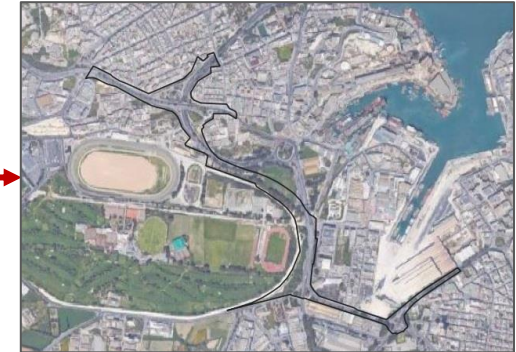
Case study: North Harbours and Grand Harbour Local Plans, Malta

TYPOLGY	SPECIFIC INSTRUMENT	EXAMPLES FROM MALTA LOCAL PLANS
Financial/ Incentive- based instruments	Preferred tax treatment	-
	Subsidies/grants	-
	Density bonus	-
	Financial bonds	Stipulation of financial bonds to support the implementation of adequate measures to mitigate against flood risk
	Transfer of development rights mechanisms	-



Case study: North Harbours and Grand Harbour Local Plans, Malta

TYOLOGY	SPECIFIC INSTRUMENT	EXAMPLES FROM MALTA LOCAL PLANS
Other instruments (informative)	Principles, guidelines, and criteria for public space design	Introduction of tree planting and/or other landscaping elements in streets or other public spaces.
	Principles for territorial management	Consideration of implementation of future planning documents, such as environmental upgrading and landscaping schemes, rehabilitation schemes, or afforestation programmes.
	Promotion of good practices	Encouraging privates to take measures to improve their property, such as screening industrial estate through tree planting and other landscaping measures.



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Thank you for your attention!

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