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ID 1754 | RESILIENCE ASSESSMENT TOOL FOR PUBLIC SPACE REGENERATION

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ABSTRACT: The reacting capacity of a territorial system to multiple stresses can be described as its "resilience". It expresses the ability of a system to absorb, recover from and successfully adapt to stressing circumstances. To make cities more resilient to natural disaster risks, international initiatives, such as the UN Agenda 2030 for Sustainable Development and the Sendai Framework for Disaster Risk Reduction (2015-2030), recommend the application of risk management measures and procedures, and stress the importance of preserving and safeguarding cultural heritage as a key element of safe, inclusive, sustainable and resilient cities. Urban planning and regeneration can be opportunity to design safe and resilient public spaces according to risk management, enhancing the overall city resilience to natural disaster risks. In this work, we develop a methodology to assess resilience to natural disaster risk in cities and public spaces, allowing the integration of risk management into ordinary planning tools. We identify which are the drivers that make cities and public spaces resilient to natural disaster risks, adopting a systemic approach that interprets cities as complex, dynamic, self-organizing systems, continuously changing under the pressure of perturbing factors caused by internal processes or external factors. A set of *drivers* (4), *driver descriptors* (15) and *sub-drivers* (36) were identified. A single sub-driver was associated to one or more phases of disaster risk management and to one or more goals of resilience. The method allows to overcome the sectorial approaches of territorial management through an integrated decision support tool for resilience-oriented planning. Particular attention was posed to the role of cultural heritage because it enhances the sense of belonging to the place and thus can enhance the response of citizens to adverse natural events. The territory of the Ischia Island, in Southern Italy, was identified as a suitable case study for future testing of the methodology. In Ischia, the presence of natural and cultural heritage coupled with the exposure to many natural hazards (seismic, volcanic, landslide, coastal erosion and marine inundation), and the intensive urbanization, could favor the validation of the methodology here proposed.

KEYWORDS: urban resilience, public space, urban design, risk management, cultural heritage.

1 INTRODUCTION

Public spaces should be designed to provide cities with beautiful, human-scaled and walkable open areas, creating a unique atmosphere, sense of place and identity. Furthermore, public spaces should be "safe", both in the daily use and in the face of hazardous events and emergencies that threaten people's life. The Agenda 2030 for Sustainable Development (United Nations, 2015) advocates the development of safe, inclusive, resilient and sustainable cities (Goal 11), by protecting and safeguarding the world's natural and cultural heritage (Target 11.4), reducing the number of deaths and damages caused by disasters (Target 11.5), and increasing the number of cities and human settlements adopting and implementing integrated policies and plans towards resilience to disaster and holistic disaster risk management, according to the Sendai Framework for Disaster Risk Reduction 2015-2030 (Target 11.b). In order to achieve these fundamental aims at global scale, cities should implement feasible, economically viable, easy-to-use and effective tools to enhance their ability to cope with natural disaster risks. A set of integrated actions to increase city resilience to natural disaster risks should include information and preparation of citizens, cultural and natural heritage protection, and the design and equipment of public spaces. It requires a large effort in terms of human and economic resources. However, public resources are more and more scarce, particularly at the local and municipal level. Moreover, the integration of risk management into ordinary urban planning presents many difficulties due to the sectorial education and skills of urban planners and risk management officers. Thus, the enhancement of cities resilience can become extremely challenging, preventing the achievement of global goals. Existing funding provided for urban regeneration processes can be an opportunity, if sectorial approaches are overcome in favor of more integrated, multidisciplinary and systemic approaches. The concept of urban regeneration includes actions improving the economic, physical, social and environmental condition of an area that could be subject to changes (Roberts & Sykes, 2008). Thus, the synergy between risk management and urban

regeneration strategies can be the key to achieve safe and resilient cities. In recent years, the concept of resilience emerged as an important quality of natural and man-made systems (Folke, 2006) to cope with the effects of stressor events. The term resilience expresses the capacity of a system to withstand, respond to, adapt and prepare more readily to shocks and stresses to emerge stronger after tough times, and live better in good times (The Rockefeller Foundation & ARUP, 2015). This perspective highlights that resilience should not be interpreted as a static equilibrium, because urban systems can change and become different from their original conditions, in response to strains (Ahern, 2011; Carpenter et al., 2001). The needs pointed out in the Agenda 2030 were highlighted by the international scientific community since the end of eighties. The International Decade for Natural Disaster Reduction (IDNDR, 1989) recommended to integrate disaster-mitigation programs, land use and insurance policies for disaster prevention and to establish education and training programs to enhance community preparedness. The Yokohama Strategy and Plan of Action for a Safer World (United Nations, 1994) and the International Strategy for Disaster Reduction (1999) highlighted that managing disaster in the response phase alone is not sufficient, because it yields temporary results at a very high cost, thus underlining that all the phases of risk management should be considered integral parts of policies and urban planning at regional, national and international scales. The recommendations were received by Hyogo Framework for Action (2005-2015) which stressed the importance of innovative and pro-active approaches to involve people in all stages of disaster risk reduction (UNISDR, 2005). It also pointed out the need of building a culture of safety and resilience at all levels, improving international collaboration on resilience issues and allocating proper resources to reduce the impacts of natural hazards. Recently, the Sendai Framework for Disaster Risk Reduction (2015-2030) has emphasized the different concepts of disaster risk management and disaster management (UNISDR, 2015). Disaster risk management assumes the implementation of actions that allow the city to cope with dangerous events and reduce their effects, while disaster management applies when events have already occurred. Aiming at enhancing the resilience of cities to disasters, this document suggests to develop a new concept of disaster risk, which can be seen as part of a multidimensional and systemic framework including also the preservation of natural and cultural heritage in the face of natural hazards. The Sendai Framework recognizes thus the positive role of cultural heritage to improve urban resilience, since it is has historic, aesthetic, social, scientific and spiritual values for past, present, and future generations. The international frameworks recognized the importance to consider the resilience goals (prevent, prepare for, cope with, respond to, and recover from) in ordinary planning to manage the impacts of natural shocks and stresses (UNISDR, 2015). All the measures adopted before, during and after the occurrence of a dangerous event, to ensure human security, well-being, quality of life, resilience and sustainable development are part of risk management phases (*mitigation, preparedness, response, recovery*) (IPCC, 2012). *Mitigation* phase focuses on increasing the capacity to withstand natural hazards; *preparedness* phase addresses the process to get ready the population to the event occurrence; *response* phase aims to ensure a scalable, adaptable, and flexible reactions; and *recovery* phase aims to apply measures to rebuild and revitalize the affected communities. In this work, starting from previous literature review regarding categories and indicators of systemic urban resilience (Iavarone, Gravagnuolo, Esposito De vita, & Alberico, 2017), we identify which are the drivers that make cities and public spaces resilient to natural disaster risks and propose an evaluation framework to assess resilience of cities and public spaces exposed to natural hazard. In addition, we point out the key role of natural and cultural heritage as element enhancing urban resilience. This frame includes 4 *drivers* and 36 *sub-drivers* of urban resilience and recognizes for each *sub-driver* the resilience goals (prepare for, respond to, withstand, adapt to) and risk management phases (mitigation, preparedness, response, recovery). The proposed resilience assessment tool allows overcoming the sectorial approaches of territorial management thanks to the integration of disaster risk management measures into territorial plans in force (e.g. Regional Territorial Planning, Provincial Territorial Planning, Municipal territorial planning) and to the identification of priorities for intervention for resilient cities and public spaces.

2 METHODOLOGY

Disasters caused by dangerous events and environmental stresses such as climate change have a critical impact on the public space of the city, affecting the natural and built environment, but also the economy and society. The ability to absorb, adapt, transform and prepare for shocks and stresses is influenced by the institutional capacity and availability of critical resources at local scale, thus the management of risks requires a highly multidisciplinary and systemic approach.Evaluation tools can be useful to ensure the identification of features of a resilient urban system exposed to natural hazard, to assess the present territorial status, provide guidelines for its enhancement and monitor its evolution in the future. The evaluation framework proposed in this work integrates sectorial approaches of territorial planning and disaster risk management, identifying *drivers* and *sub-drivers* of urban resilience and recognizing their locations in all phases of risk management (Figure 1).

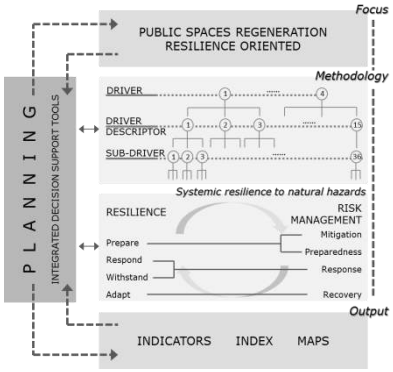

Figure 1 –Evaluation framework scheme. A brief description of logical model (focus, methodology, output and planning), the risk management tools (indicators, indeexes and maps) and the key role of data integration (dark gray box) are shown.

The *drivers* can be defined as elements of the complex territorial system (economic, social, environmental, institutional) that drive urban resilience. The *sub-drivers* represent specific aims of resilience-oriented urban regeneration, which can be used not only to "measure" and map resilience through the selection of suitable indicators, but also to produce evidence of the weaknesses of public realm that need to be enhanced through urban regeneration tools. The framework is structured into three main parts:

1) Identification of focus (public space regeneration resilience oriented);
2) Development of the methodology (identification of *drivers* and *sub-drivers* that make cities and public spaces resilient to natural hazard);
3) Identification of links between risk management phases (mitigation, preparedness, response, recovery) and resilience goals (prepare, respond, withstand, adapt).

2.1 IDENTIFICATION OF DRIVERS AND SUB-DRIVERS OF URBAN RESILIENCE

According to OECD (2016), four *drivers* help to enhance urban resilience: economic, social, environmental and institutional. *Economic driver* requires innovation and diversification of economic activities; *social driver* ensures inclusive society, active citizens networks and access to opportunities, infrastructures and services; *environmental driver* requires that urban development is sustainable, natural resources and adequate infrastructures are available; finally, *institutional driver* requires clear leadership and long-term vision, proper

resources at local scale, governments cooperation and openness to participation. For the single *driver,* the conditions that lead to a resilient city (field *description* in Table 1) and related *driver descriptors* (e.g. E1 - Employment and workforce, E2 – Entrepreneurship, E3 - Local productivity) were defined and listed in Table 1. Specific *sub-drivers* representing the optimal characteristics that a resilient urban system may have, at the scale of the public space, were identified. They were deduced from a broad literature review (Iavarone et al., 2017) and the "Resilient Cities" framework (OECD, 2016), which has been already tested in ten cities worldwide and can be considered a robust evaluation structure. A total of 36 *sub-drivers* have been proposed (table 2), which express the qualities that cities and public spaces should achieve to be considered resilient to natural shocks and stresses. Specifically, 7 *sub-drivers* are related to the economic *driver* (more broadly intended to express resilience at the city scale); 8 *sub-drivers* pertain to the social *driver* (expressed at the city and public space scale); 12 *sub-drivers* express the environmental aspects of resilience (specifically expressed at the public space scale); and 9 *sub-drivers* are related to the institutional *driver* (at the city scale).

Driver	Description	Driver Descriptor
Economic	All productive activities, trade and services in a specific territory; it includes economic sectors (primary, secondary and tertiary) and their diversification, the level of innovation and creativity, vitality of entrepreneurial environment, skills and education of workforce, which influence the overall capacity of response of a community to adverse events.	E1 - Employment and workforce
		E2 - Entrepreneurship
		E3 - Local productivity
Social	Includes socio-economic characteristics of population such as age, gender, employment, education, income, health and wellbeing; it also includes the access to communication means, transport means and health services; also, social cohesion and cultural aspects such as the relationship of community with its environment, which influences the inclination of a community to recover from adverse events.	S1 - Socio-economic
		S2 - Services (communication, transport, health)
		S3 - Socio-cultural
Environmental	Includes the characteristics of the natural and built environment, land uses and infrastructures; it also includes natural and cultural heritage as element of particular value of the environment, but also as factor of increased vulnerability if adequate mitigation measures are not implemented.	En1 - Natural environment
		En2 - Built environment
		En3 - Infrastructures (streets, energy, ICT)
		En4 - Land use
Institutional	The capacity of institutions at all levels to manage the territory, also in case of natural dangerous events, through urban / territorial planning tools, risk management tools and emergency management tools; it includes financial resources available at local level for risk management, and the capacity of institutions to be open and inclusive, promoting active participation of the community to emergency planning and risk management decision processes.	I1 - Leadership and long-term vision
		I2 - Territorial management
		I3 - Institutional collaboration
		I4 - Financial resources
		I5 - Citizens' engagement

Table 1 – Drivers of urban resilience to natural disaster risk

2.2 RESILIENCE AND RISK MANAGEMENT

The evaluation framework proposed in this work poses particular attention to the key role of relation between the urban resilience goals and the four phases of disaster risk management. Mitigation focuses on the impact of a hazard and encompasses the structural and non-structural approaches taken to reduce the interaction of human, property and environment with dangerous events and to limit their vulnerability. Mitigation actions differs from these applied to survive during an emergency because they are programmed for a long-term and can take place before and after emergencies. Mitigation measures can involve changes in local building codes to fortify buildings, revised zoning and land use management, strengthening of public infrastructure, retrofitting structures to withstand natural hazards, construction of defences and other efforts to make the community more resilient to a dangerous event (FEMA, 2010). Preparedness addresses the process for developing and maintaining capabilities for the whole community both pre and post event through the education, outreach and training of the population. It includes engaging the business community, evacuation planning and other logistical readiness activities such as stocking food and water (FEMA, 2010). Response addresses the actions taken in the immediate aftermath of a dangerous event to save and sustain lives, meet basic human needs (food, shelter, clothing, public health and safety), reduce the loss of property and limit the effect on critical infrastructure and on environment. Right after the solution of the immediate emergency issues, the focus shifts to planning action aiming at reparation of property, restoration of utilities, stabilization of public services and conclusion of clean-up process. Response planning provides rapid and disciplined incident assessment to ensure a quickly scalable, adaptable, and flexible response (FEMA, 2010). Recovery encompasses both short-term and long-term efforts for the rebuilding and revitalization of affected communities, aiming at the return to a degree of physical, environmental, economic and social stability and to future sustainability and resiliency. The short-term phase involves delivering immediate services, including the restoration of interrupted utility services, the reestablishment of transportation routes and the provision of food and shelter to displaced persons, while the long-term phase requires thoughtful strategic planning and action to address more serious or permanent impacts of a disaster. Particularly a recovery plan should address prewritten emergency ordinances that facilitate recovery operations, such as those dealing with road closures, debris removal and expedited permitting; it also should incentive community efforts aiming at the improvement of mitigation processes and should develop strategies for including civic leaders and the public in the recovery decision-making process (FEMA, 2010). Taking into account all aspects considered in these definitions, each *sub-driver* of urban resilience was correlated to one or more phases of risk management (Table 2).

Driver	Driver Descriptor	Sub-Driver	Goals Of Resilience	Risk Management Phase
Economic	E1 Employment and workforce	The population in working age is actively employed	Ability to adapt	Recovery
		Workforce has diverse skills	Ability to adapt	Recovery
		Workforce is employed in sectors useful to cope with natural hazards	Ability to respond, withstand and adapt	Response Recovery
		Industries are diverse	Ability to adapt	Recovery
	E2 Entrepreneurship	Innovation takes place	Ability to prepare for and adapt	Mitigation Preparedness Recovery
		The entrepreneurial ecosystem is vital	Ability to adapt	Recovery
	E3 Local productivity	Adequate stock of primary resources is ensured	Ability to respond, withstand and adapt	Response Recovery

Social	S1 Socio-economic	Society is inclusive	Ability to adapt	Recovery
		Resources are equally distributed	Ability to respond, withstand and adapt	Response Recovery
	S2 Services (communication, transport, health)	People have access to communication devices	Ability to prepare for and adapt	Preparedness Response
		People have access to transport means	Ability to respond and withstand	Response
		People have access to health services	Ability to respond and withstand	Response
	S3 Socio-cultural	People recognize and feel proud of their city's identity	Ability to prepare for and adapt	Mitigation Recovery
		The Heritage Community takes care and valorises cultural heritage / landscape	Ability to prepare for and adapt	Mitigation Recovery
		Citizen's organizations are active in the community	Ability to prepare for, respond, withstand and adapt	Mitigation Preparedness Response
Environmental	En1 Natural environment	Adequate Green Infrastructures are realized to cope with natural hazard	Ability to respond and withstand	Response
		Natural heritage is preserved	Ability to adapt	Recovery
	En2 Built environment	Buildings are robust and safe to cope with natural hazards	Ability to prepare for, respond and withstand	Mitigation Response
		Inhabited areas are not overpopulated	Ability to prepare for, respond, withstand and adapt	Mitigation Response Recovery
		Buildings are covered by insurance	Ability to adapt	Recovery
		Adequate equipped and safe spaces are available for emergency	Ability to prepare for	Preparedness
		Cultural heritage / landscape is well-conserved	Ability to prepare for and adapt	Mitigation Recovery
		Cultural heritage / landscape is safeguarded from natural hazards	Ability to prepare for and adapt	Mitigation Recovery
	En3 Infrastructures (streets, energy, ICT)	The infrastructures are well distributed over the territory	Ability to prepare for, respond, withstand and adapt	Mitigation Response Recovery
		The infrastructures are well maintained	Ability to prepare for, respond, withstand and adapt	Mitigation Response Recovery
	En4 Land use	Degraded areas are absent or in phase of regeneration	Ability to prepare for and adapt	Mitigation Recovery
		The city/territory carries out urbanization rates	Ability to prepare for and adapt	Mitigation Recovery
Institutional	I1 Leadership and long-term vision	Leadership and long-term vision are clear / include learning from past natural events	Ability to prepare for and adapt	Mitigation Preparedness Recovery
	I2 Territorial management	Urban planning is regulated	Ability to prepare for and adapt	Mitigation Recovery
		Risk management plans are available and periodically updated	Ability to prepare for and adapt	Mitigation Preparedness Recovery
	I3 Institutional collaboration	Local governments cooperate with regional and national governments	Ability to prepare for, respond, withstand and adapt	Mitigation Response Recovery
		Local governments, institutions and civil society organizations cooperate	Ability to prepare for, respond, withstand and adapt	Mitigation Preparedness Recovery
	I4 Financial resources	Adequate financial resources are available at municipality level	Ability to prepare for and adapt	Mitigation Recovery
	I5 Citizens' engagement	People are informed about the natural hazards that may affect the city	Ability to prepare for	Preparedness
		People are able to apply emergency plans directives	Ability to prepare for, respond and withstand	Preparedness Response
		Government is open and citizens' participation takes place	Ability to prepare for and adapt	Mitigation Preparedness Recovery

Table 2 - Structure of drivers and sub-drivers of urban resilience related to risk management

3 DISCUSSION AND CONCLUSIONS

The methodology proposed in this work identifies 4 *drivers* and 36 *sub-drivers* to assess the resilience of cities and public spaces for urbanized areas exposed to natural hazard. Each *sub-driver* represents the optimal conditions that cities and public spaces should have to cope with natural disaster risk. They were associated to one or more phases of disaster risk management and one or more goals of resilience. The assessment framework proposed overcomes the sectorial approaches of territorial management providing a decision support tool useful to enhance daily territorial management though resilience-oriented guidelines for planning and design. Particular attention was posed to the role of cultural heritage, which highly contributes to social resilience, providing in communities a sense of belonging to the place that can enhance the response of citizens to adverse natural events, particularly in the phase of reconstruction, recovery and adaptation to a new equilibrium, without losing the cultural inheritance of the past. Moreover, it can positively influence city creativity, innovation and the vitality of the entrepreneurial environment, indirectly enhancing economic resilience. The assessment framework takes into account the key role of natural and cultural heritage. In fact, it comprehends the following 5 *sub-drivers*:

- Social (Socio-cultural): People recognize and feel proud of their city's identity
- Social (Socio-cultural): The Heritage Community takes care and valorises cultural heritage / landscape
- Environmental (Natural environment): Natural heritage is preserved
- Environmental (Built environment): Cultural heritage / landscape is well-conserved
- Environmental (Built environment): Cultural heritage / landscape is safeguarded from natural hazards

Moreover, some specific *sub-drivers* were added to the list proposed by OECD (2016), which ensure the achievement of resilience goals (ability to prepare for, respond, withstand and adapt):

- Environmental (Built environment): Buildings are covered by insurance (*ability to adapt*).
- Environmental (Built environment): Adequate equipped and safe spaces are available for emergency (*ability to prepare for*).

- Environmental (Infrastructures): The infrastructures are well-distributed over the territory (*ability to prepare for, respond, withstand and adapt*).
- Environmental (Land use): Degraded areas are absent or in phase of regeneration (*ability to prepare for and adapt*)
- Environmental (Land use): The city / territory carries out urbanization rates (*ability to prepare for and adapt*).

Sub-driver labelled "*Adequate green infrastructures are realized to cope with natural hazard*" (e.g. green space created around the southern edge of Manhattan after hurricane Sandy in 2012) has been also considered to improve the resilience of large parts of the city (Iavarone et al., 2017). The assessment framework proposed in the present work can be a valid decision support tool in planning processes, enhancing resilience in a territory through the integration of urban regeneration and risk management tools. It can be further developed through the identification of multidimensional evaluation tools (quantitative and qualitative indicators, indexes and draw maps) useful to enhance the urban liveability through resilience-oriented plans. The methodology will be tested in a real case study to identify possible weaknesses and refine the assessment framework. Possible limitations due to data availability, particularly for qualitative data, need further investigation through case study application. Specific selection criteria led to the identification of the Ischia Island, located in the north-western zone of Napoli Bay (Southern Italy), as a suitable area for the pilot test. They were the presence of both natural and cultural heritage, exposure of the territory to multi-hazard, and the availability of institutional quantitative and spatial data for a first assessment of the territorial structure. Ischia Island territory includes six municipalities: Ischia, Barano d'Ischia, Casamicciola Terme, Lacco Ameno, Forio d'Ischia and Serrara Fontana. Its local economy is based mainly on tourism in urban coastal areas, while the cultural landscape in mountain areas still preserves wide forests and agricultural terraces characterized mainly by vineyards and fruit trees (Gravagnuolo, De Rosa, Ronza, Di Martino, & Fusco Girard, 2017). Natural and cultural heritage such as lava domes, headlands, cliffs, pocket beaches, castles, towers, chapels and villas, are hotspots in the waterfront landscape (Figure 2). The presence of such elements in coastal areas, exposed to many natural hazards (seismic, volcanic, landslide, coastal erosion and marine inundation) and intense urbanization (Alberico & Petrosino, 2014, 2015), make the Ischia Island a relevant case study to test the proposed resilience assessment tool.

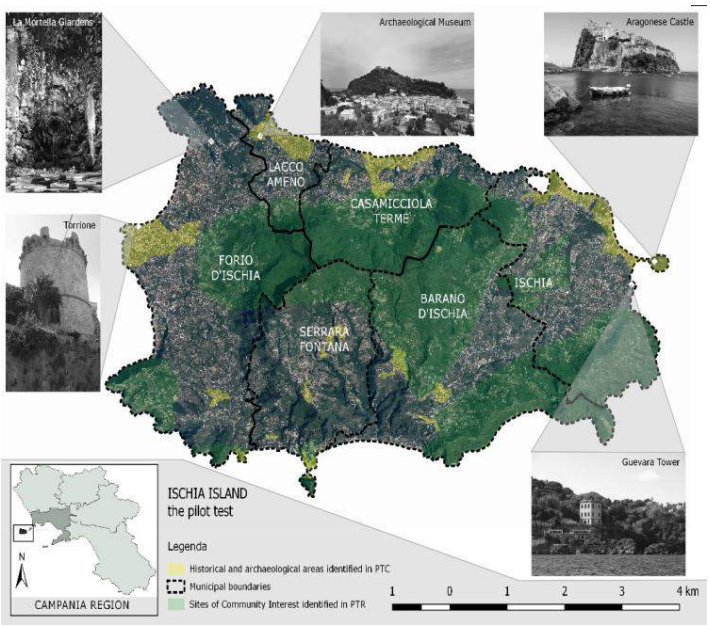

Figure 2 – Ischia Island. Map of key elements of the current territorial structure: cultural heritage, areas of high nature value, institutional municipal boundaries

Future research will focus on the development of a matrix of suitable quantitative and qualitative indicators, applied in the spatial dimension in the Ischia Island case study, which will be used to rank the territory in different resilience classes, identify weak areas that need resilience-oriented regeneration and produce specific guidelines for the enhancement of public spaces. For the four phases of risk management urban resilience maps can be drawn, which could support the identification of priorities for interventions at the municipal and inter-municipal scale and at the scale of public space.

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ID 1363 | "MIND THE MINDEMYREN" A NEW SPATIAL ANALYSIS TOOL FOR LINKING BUILDING DENSIFICATION STRATEGIES TO PUBLIC TRANSPORT AND STREET NETWORK ACCESSIBILITY IN BERGEN CITY

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1 INTRODUCTION

The population in Bergen city is growing fast. There is a need for areas for facilitating such a population growth. However, the availability of land is scarce, as the city is squeezed between seven mountains on the hilly west coast of Norway. Today, about 279 000 inhabitants live in Bergen. The population is growing with 4000 inhabitants per year. This is 2,5 times higher than the Norwegian bureau of statistics predicted in 2007 (www.bergen.kommune.no).

Old industrial areas and existing low density areas located adjacent to the city centre are becoming attractive for urban transformation. The industrial area Mindemyren is one of the urban areas with the largest transformation and densification potentials. Today this area functions as a barrier between surrounding dwelling areas by roads, old railways, fences, large long buildings and a lack of cross connections for pedestrians. The size of the area is comparable to the city centre. Bergen municipality has a policy to transform this area into a new urban centre in the next 25 years. At this moment, the area is the largest urban transformation area in Norway. This gives the opportunity on the one hand to create a new centre for the surrounding dwelling areas and to facilitate population growth on the other hand.

Population growth implies pressure on the existing infrastructure network. After a half a century of road building and facilitating the private car in city centres, the emphasis is currently shifting towards improving the public transport network and to implement a second light rail line in Bergen. A light rail line opened in 2009. The last part of the line has recently been finished. During the last 5 years, this light rail contributed to densification around the stations and to an increase of the property prices in the stations' vicinity.

At present, a proposal for the location of a second light rail line is now on the drawing table. The track of light rail line 2 goes through the Mindemyren area, and connects the Fyllingsdalen area on the other side of a large mountain with the city centre with a tunnel. The location of this light rail shapes a unique possibility to establish integrated urban design solutions in the Mindemyren area.

A land use plan has already been made. The plan has a flexible solution. Due to strong property rights in Norway, development depends on the will of the various property owners. Therefore, the challenge here is to facilitate with a proper infrastructure to trigger densification.

In addition, a change in Norwegian planning practice is currently taking place. Until recently, rigid street and road dimensions, minimum parking standards, the making of rigid land use plans with a land use