

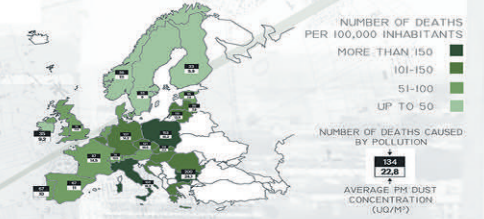
THE PROBLEM OF SMOG AND POLLUTED AIR IN THE WORLD

NUMBER OF CITIES WITH AIR POLLUTION PROBLEM PER COUNTRY



THE PROBLEM OF MORTALITY CAUSED BY POLLUTION IN EUROPE

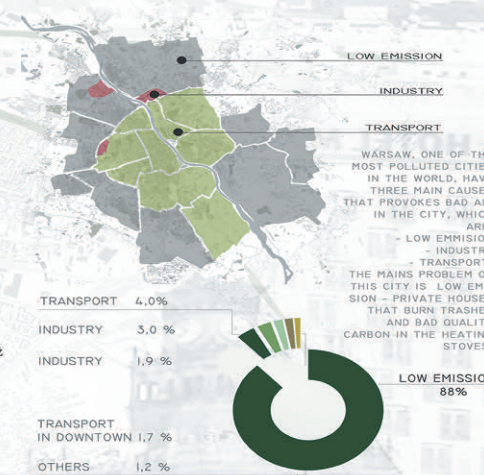
NUMBER OF CITIES WITH AIR POLLUTION PROBLEM PER COUNTRY



AIR POLLUTION IN POLAND ON THE BACKGROUND OF EUROPE WITH DIVISION INTO SUBSTANCES



THE MAIN CAUSES OF THE CRITICAL STATE OF WARSAW'S AIR



Country / City POLAND, KIELCE

University / School KIELCE UNIVERSITY OF TECHNOLOGY

Academic year 2017/2018

Title of the project PHYTOREMEDIATION PATH FOR AIR POLUTION. WARSAW CASE STUDY

Authors MARTA LESZKOWICZ, ANNA KISIEL, KINGA GOLA, KRYSZTYAN CIURKOT





PERFORMATIVE NATURE

Barcelona International Landscape Architecture Biennial

September 2018 **Barcelona**

SCHOOL PRIZE

X International Landscape Architecture Biennial

Máster d'Arquitectura del Paisatge -DUOT - UPC
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TECHNICAL DOSSIER

Title of the project PHYTOREMEDIATION PATH FOR AIR POLLUTION. WARSAW CASE STUDY
Authors MARTA LESZKOWICZ, ANNA KISIEL, KINGA GOLA, KRYSZTOF CIURKOT
Title of the course STREET FURNITURE AND GREEN DESIGN
Academic year 2017/2018
Teaching Staff MAGDALENA WOJNOWSKA-HECIAK
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Written statement, short description of the project in English, no more than 250 words

The project aims to create a phytoremediation path for the capital of Poland – Warsaw, to reduce air pollution and smog problems. Warsaw, as the center of an agglomeration is exposed to a wide range of air pollutants, which is caused not only by traffic, but also low stack-emission and industry. The air quality in Warsaw is very low and more and more onerous for inhabitants. Dangerous to health carcinogenic dusts and carbon oxides are emitted to the atmosphere. In order to improve the environment quality that influences citizens's health, a system of green phytoremediation paths is created. The main paths are located along the railway on an undeveloped area, that belong to a municipality. It creates a green buffer zone aligned to the most common in this area wind direction. This measure considerably reduces harmful substances movement in the city. Along the main paths modular pocket parks were located. Species and sizes of phytoremediation plants are chosen to best fit the local conditions. Paths are created as "the walls" for the smog and quality of air improvement, and also place' aesthetic improvement. Species selection will be based on plants, which best purify the air, are easy to care and have the opportunity to grow in difficult environment conditions. The use of a biological method to environmental purification – the phytoremediation – considerably improves the environment quality in highly urbanized area.

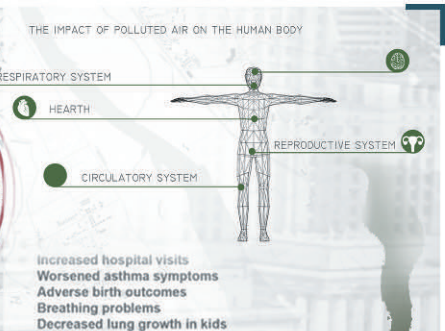
For further information

Máster d'Arquitectura del Paisatge -DUOT - UPC

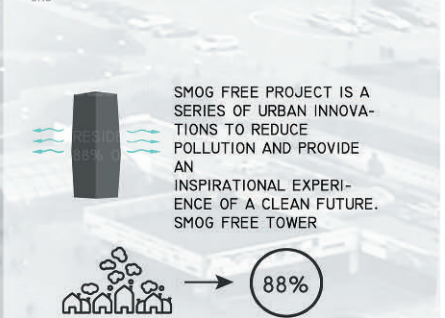
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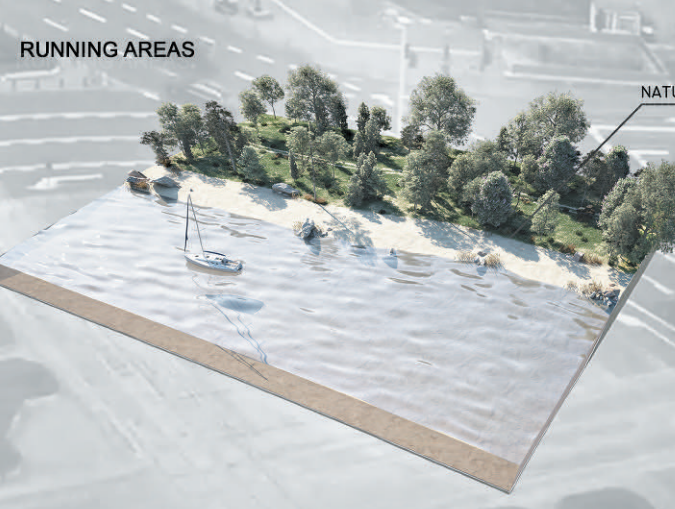
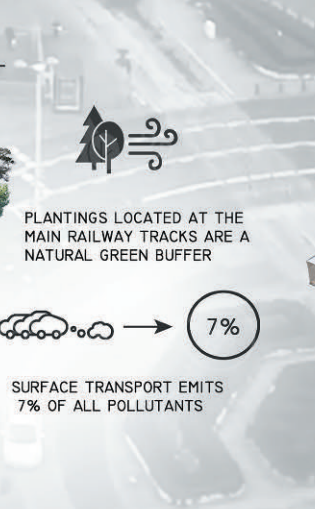
Increased hospital visits
 Worsened asthma symptoms
 Adverse birth outcomes
 Breathing problems
 Decreased lung growth in kids
 Lung cancer
 Early death



RESIDENTIAL BUILDINGS ACCOUNT FOR 88% OF THE TOTAL SMOG EMISSION

NATURAL DRAINAGE SYSTEMS

DRAINAGE SYSTEMS THAT CLEAN UP RAINWATER FROM HARMFUL SUBSTANCES. HE CAN HANDLE ANY OF THE SMOG HEADS. THE SUBSTRATE RETAINS EVEN THE SMALLEST PARTICLES, PREVENTING THEM FROM ENTERING THE ENVIRONMENT.



AN EXAMPLE OF TRANSFORMING A PAVED SURFACE IN THE CITY CENTER INTO A GREEN PATH USING PHYTOREMEDIATION PLANTS

PLANTING PHYTOREMEDIATION PLANTS ALONG THE STREET



TRAM TRACKS OVERGROWN WITH GRASS OR SEDUM



SUSPENDED GREENERY BETWEEN OVERPASSES

EXAMPLES OF PHYTOREMEDIATION PLANTS



MAPLE



BASSWOOD



BEECH



HYDRANGEA



LILAC



BLACK LOCUST

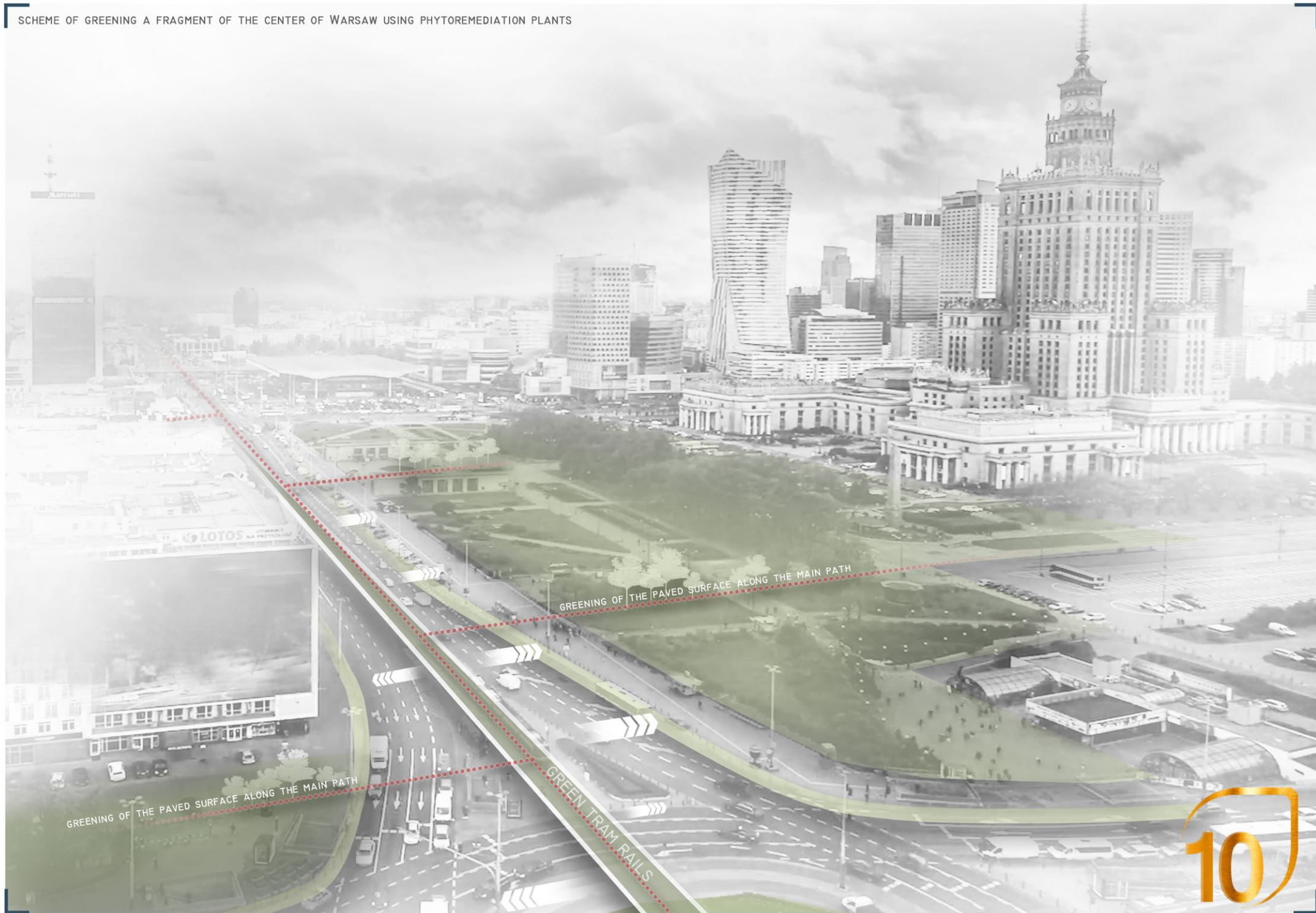


IVY



BARBERRY





GREENING OF THE PAVED SURFACE ALONG THE MAIN PATH

GREENING OF THE PAVED SURFACE ALONG THE MAIN PATH

GREEN TRAM RAILS