

# REPORT OF THE PILOT ACTION OF URBAN ENVIRONMENTAL ACUPUNCTURE LIPTOVSKÝ MIKULÁŠ

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## 1. INTRODUCTION

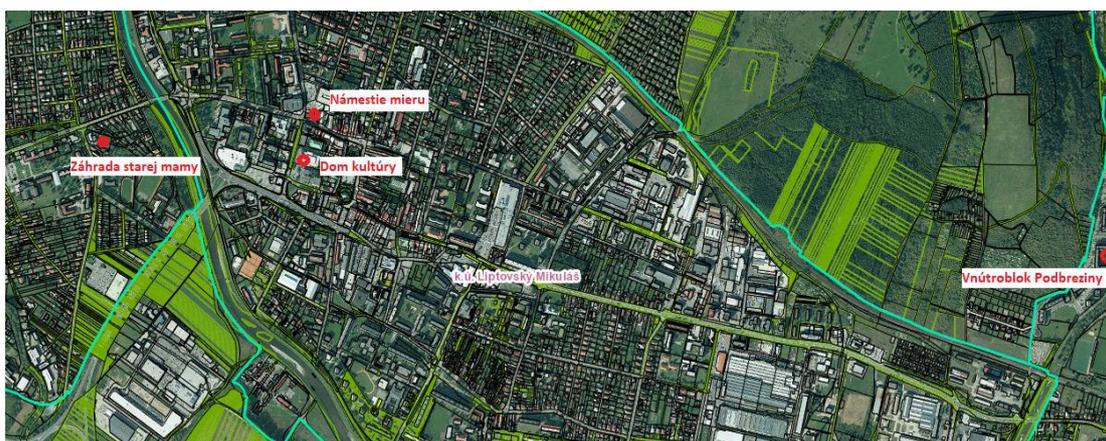
The city of Liptovský Mikuláš is one of the medium-sized towns of the Slovak Republic, and serves as the administrative, economic, and cultural center of the district. The territory of the city consists of 15 urban areas. It lies in the north of Slovakia, on the main route from Žilina to Vysoké Tatry. The Váh River runs through the territory, which flows into the Liptovská Mara water reservoir. When planning city development, city management is based on strategic documents: city plan, city development program, and sector strategies. The core of the Liptovský Mikuláš settlement system of green areas represents existing areas of publicly accessible greenery such as parks and greenery of residential areas. They are mainly the areas of public greenery in the urban areas of Nábřežie - Vrbica and Podbreziny, located near the Váh and Smrečianka watercourses. An important part of the green area is the greenery of public spaces, consisting of smaller parked areas and planting of trees in the pavement. This focuses in the city center, especially on the pedestrian zone, where it has an important space-making and hygienic function. An inseparable part of the system of urban green areas consists of proposed recreational areas on the edge of the current built-up area. The green spots need a balanced development of the urban environment for a better life of the inhabitants. All of these tasks are the agenda of the city's chief architect and environmental department.

The concept of urban environmental acupuncture consists in using small sites for location of various types of interventions developed as nature based solutions. The city aims at protection and development of natural resources by the integrated environmental management of green and blue infrastructure with planting native and climate resistant vegetation in small spots selected all over the whole functional urban area. The purpose of this project is implementation of the Urban Environmental Acupuncture (UEA) as an important addition to the other green areas like parks, urban forests, gardens and other in the area of three cities. The numerous interventions in many small spots in the FUA can provide an effect for the FUA as a whole. The effect would be in enlargement of natural resources, including native species and climate resistant plants suitable to local conditions. Also the natural capital will be enhanced by improving local climate and strengthening FUAs area resistant to climate changes.

Based on the analysis of starting points and local knowledge of the urbanized area of the city, 4 localities were selected that needed improvement in terms of visual, functional and ecological aspects. The necessary interventions have been proposed for these areas. Two locations in important public spaces in the city center were selected, namely Námestie mieru square and the Dom Kultúry-House of Culture. Another location was chosen in Podbreziny - the largest city estate in the town of Liptovský Mikuláš and in the unused part of the primary school complex in Palúdzka district.

Conditions for the suitability for a pilot investment in green acupuncture were mainly:

- site or building ownership
- good accessibility for residents
- making abandoned spaces more attractive
- low cost maintenance



## 1.1. EVALUATION OF SOIL AND CLIMATE CONDITIONS FOR 4 SMALL SITES WITH PLANT RECOMMENDATIONS

Physico-chemical characteristics of the soil found during a field survey in cooperation with the advisory expert IURS - Institute for Sustainable Development of Settlements Ostrava:

### Basic climatic parameters

	Mean temperature (° c)	min. Temperature (° c)	max. Temperature (° c)	rainfall (mm)
jan	-3,8	-7,8	0,5	7
feb	-2,3	-6,5	2,7	6
mar	1,5	-2,8	7,1	7
apr	6,4	1,3	12,1	8
may	11,9	5,7	18,0	10
jun	14,8	8,6	20,9	12
jul	16,3	10,0	22,6	10
aug	15,6	9,4	22,8	8
sep	11,6	6,3	18,1	8
oct	6,7	2,2	12,9	8
nov	1,4	-1,9	5,5	8
dec	-2,5	-5,9	1,3	9

Soil characteristics Values are mean ± SE (n=5)	<b>Podbreziny</b>	<b>Námestie mieru</b>	<b>ZŠ Palúdzka</b>
Soil texture	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
pH (H <sub>2</sub> O)	7.69 ± 0.06	7.47 ± 0.09	7.34 ± 0.11
pH (KCl)	7.32 ± 0.06	6.97 ± 0.11	6.68 ± 0.16
EC (µS cm <sup>-1</sup> )	227 ± 8	224 ± 13	180 ± 23
OM (%)	5.20 ± 0.68	8.10 ± 0.53	6.86 ± 0.31
N (%)	0.17 ± 0.02	0.26 ± 0.02	0.23 ± 0.02
P (mg 100g <sup>-1</sup> )	0.05 ± 0.00	0.72 ± 0.26	3.61 ± 0.44
K (mg 100g <sup>-1</sup> )	12.9 ± 1.9	18.0 ± 3.5	29.8 ± 6.0

By selection of the localities for interventions we considered results of soil characteristics, climatic conditions and proposed type of admissible land use.

## 1.2 DESCRIPTION OF SELECTED LOCALITIES

### 1.2.1 COURTYARD IN THE PODBREZINY HOUSING ESTATE

GPS coordinates: N 49 ° 4.87635 ', E 19 ° 38.97733'.

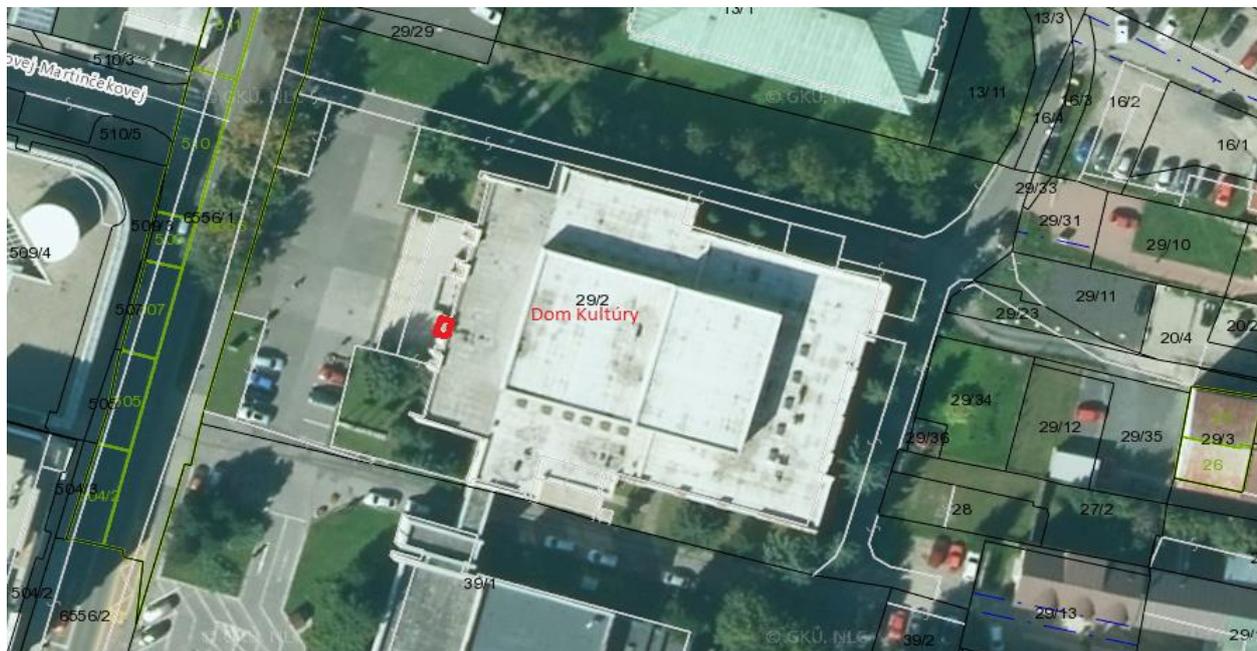
The locality is bordered on three sides by apartment buildings and on the east side by a cycle path, near corridor of a brook- Smrečianka watercourse. It is an old grassy area with paved sidewalks planted with several coniferous trees. There are also elements of a playground, which were installed during the construction of the housing estate. It is an uncomfortable cold space that causes shading by apartment buildings on three sides of the world. A positive element of this area is the Smrečianka watercourse with diverse greenery.



### 1.2.2 HOUSE OF CULTURE (DOM KULTÚRY)

GPS coordinates: N 49 ° 5.05458 ', E 19 ° 36.62723'.

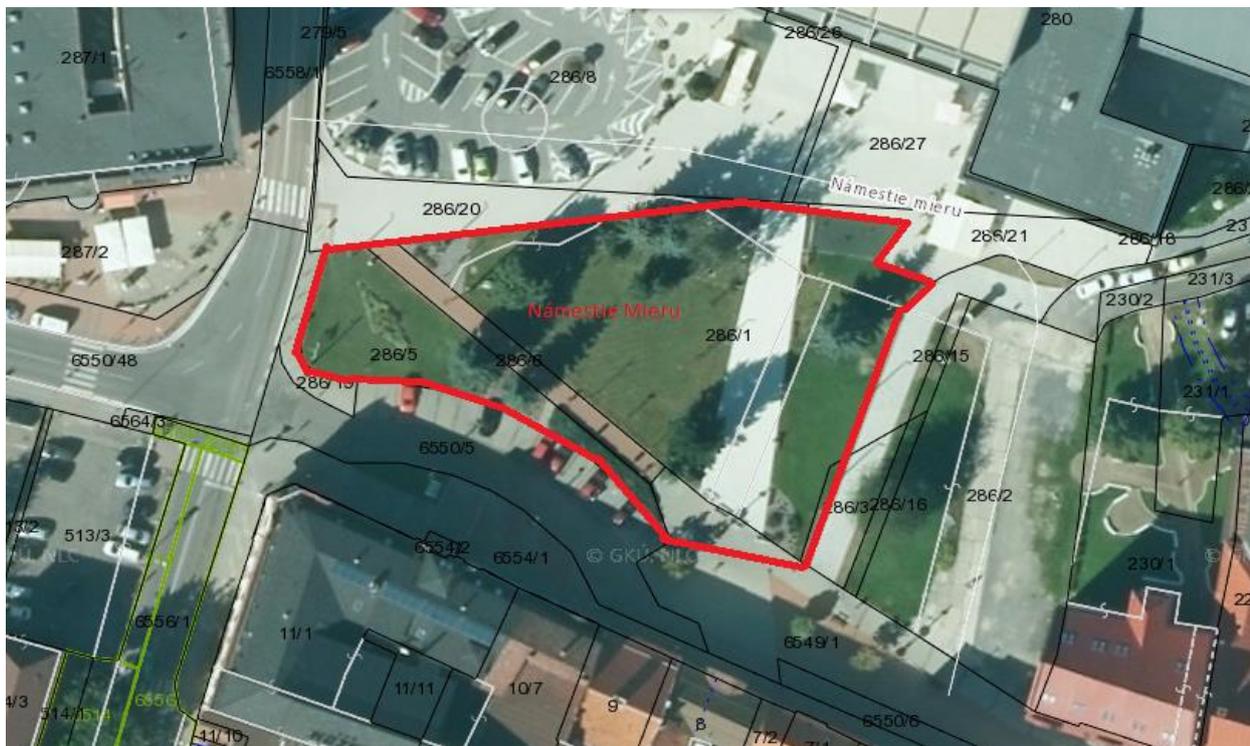
The location is in the central part of Liptovský Mikuláš. These are marble-clad buildings with part of the roof. The facade of the building has construction niches. At the entrance to the building, there is an asphalt area used as an entrance space to the building. The greenery around the building consists only of trees lining the adjacent road and flower planting in several concrete containers.



### 1.2.3 NÁMESTIE MIERU SQUARE

GPS coordinates: N 49 ° 5.12637 ', E 19 ° 36.69143'.

It is located near the House of Culture and is directly adjacent to the parking lot of the Central department store, with a bicycle path, roads to the historical part of the city, to the train and bus station. The park is mostly conifers, several of them are no longer in good conditions. In its northern part, there is an area for the installation of a fountain, which was removed for the purpose of building a parking lot. There are two interactive gameplay elements. This place does not serve as a social space in the city center.



#### 1.2.4 GRANDMAMA'S GARDEN

GPS coordinates: N 49 ° 5.08790 ', E 19 ° 36.05367'. The investment was implemented in the premises of the Primary School with a kindergarten on Demänovská Street in the Palúdzka district. The defined area is bounded on three sides by a fence. There is a school garden with flower beds for growing vegetables and herbs. The land was without trees.



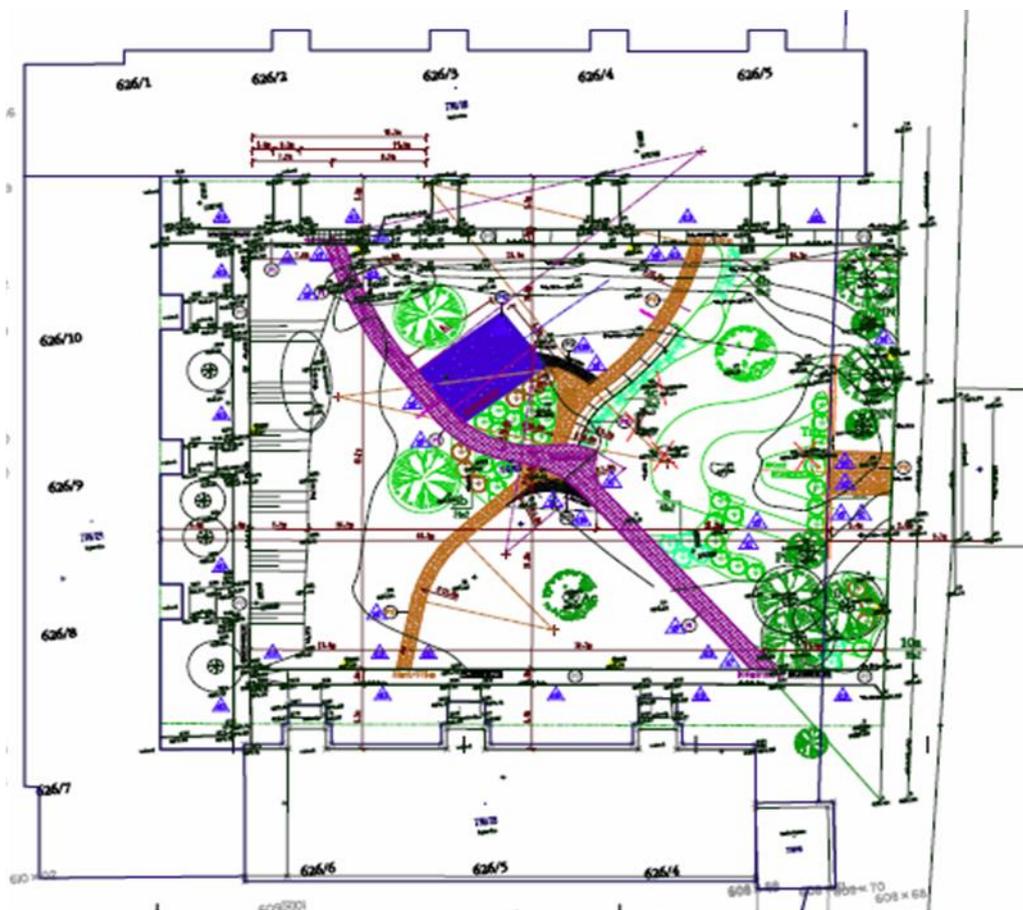
## 2. SUMMARY DESCRIPTION OF THE PILOT ACTION

### 2.1. COURTYARD IN THE PODBREZINY HOUSING ESTATE

Regeneration of the housing estate in the inner area of Podbreziny - the aim was to adapt the urban environment to climate change by planting quality greenery and creating space for leisure and socialization

for different age categories in the inner area of the housing estate Podbreziny in Liptovský Mikuláš. In this desolate place, there is also a presumption of increasing urban biodiversity.

The construction deals with the cultivation of outdated public space, which is defined by apartment buildings on the streets Senicka, Hradišská and Jefremovská in the largest housing estate in Liptovský Mikuláš - Podbreziny with an emphasis on improving the environment with emphasis on greenery and creating recreational areas - playground and artificial hill for children ie for active leisure time of the inhabitants. Separation of the inner block space from the adjacent cycle path was achieved by creating an artificial hill by laying the soil, which ended in a wall towards the cycle path. In the courtyard, a lawn were sown on the shaped terrain. Towards the courtyard, the new terrain was reduced to the original level. The current greenery of the courtyard were preserved. In the center of the courtyard were placed seating with benches. The shape and composition of the sidewalks was adapted to this function. The inner block space was complemented by shrub and flower planting, which was completely missing before. The design includes a massage (acupressure) sidewalk, where the individual fields are filled with various tread material (sand, gravel, cones, stone pebbles).



At the meeting with citizens on November 21, 2019, during the presentation of the study of the courtyard in Podbreziny housing estate, creative possibilities of design were created so that the participating citizens could create functional areas in a clean drawing of the courtyard by selecting designed elements (greenery, sidewalks, workout and playground) and their location.

In November 2019, the local self-government allowed people who live in the Podbreziny housing estate to get involved in planning the change of the courtyard. Despite some concerns about whether the issue will appeal to citizens, we were pleasantly surprised by the active participation of the participants present. Their requirements and ideas were included in the conditions for the preparation of project documentation.



Public Presentation of the Architectural Proposal of revitalisation on November 21, 2019 in Podbreziny: citizens specified where exactly they want to place the trees, benches, etc. The presentation was led by our knowledge partner – IURS – Inštitút pre udržateľný rozvoj sídiel from Ostrava (CZ)

According to climate conditions and evaluation of soil described in the introduction, Knowledge partner - The Institute for Ecology of Industrial Areas (IETU) in Katowice (Poland) proposed following kind of plants:

For the lawn, a standard grass mixture for a recreational lawn was recommended (*Lolium perenne*, *Festuca rubra*, *Poa pratensis*, *Festuca ovina*). Grass Lawn can consist of : *Agrostis capillaris*, *Anthoxanthum odoratum*, *Deschampsia caespitosa*, *Festuca rubra* komutát, *Festuca rubra*, *Festuca rubra trichophylla*, *Festuca rupicola*, *Festuca trachyphylla*, *Koeleria macrantha*, *Koeleria pyramidata*, *Poa pratensis*.

Flowers: *Agrimonia eupatoria*, *Agrimonia procera*, *Achillea collina*, *Achillea millefolium*, *Anthemis tinctoria*, *Berteroa incana*, *Betonica officinalis*, *Carum carvi*, *Centaurea cyanus*, *Centaurea jacea*, *Centaurea scabiosa*, *Cichorium intybus*, *Coronilla varia*, *Daucus carota*, *Dianthus carthusianorum*, *Dianthus deltoids*, *Echium vulgare*, *Galium album*, *Galium verum*, *Helianthemum grandiflorum*, *Hypericum perforatum*, *Knautia arvensis*, *lavandula angustifolia*, *Leontodon hispidus*, *Leucanthemum vulgare*, *Linum perenne*, *lotos corniculatus*, *Lychnis coronaria*, *Lychnis viscaria*, *Marrubium vulgare*, *Matricaria chamomilla*, *Origanum vulgare*, *Papaver rhoeas*, *Plantago lanceolata*, *Potentilla argentea*, *Potentilla recta*, *Prunella vulgaris*, *Pyrethrum corymbosum*, *Pyrethrum parthenium*, *Salvia pratensis*, *Salvia verticillata*, *Sanguisorba minor*, *Saponaria officinalis*, *Scabiosa ochroleuca*, *Silene nutans*, *Silene vulgaris*, *Succisa pratensis*, *Thymus pulegioides*, *Veronica teucrium*, *Vicia cracca*, *Vicia villosa*

Bush trees: *Euonymus europaeus*, *Euonymus verucosus*, *Hippophaë rhamnoides*, *Ligustrum vulgare*, *Lonicera xylosteum*, *Potentilla fruticosa*, *Prunus spinosa*, *Rosa canina*, *Cornus alba*, *Cotoneaster lucidus*, *Potentilla fruticosa*, *Pyracantha coccinea*, *Salix purpurea*, *Sambucus racemosa*, *Syringa vulgaris*, *Viburnum lantana*, *Viburnum opulus*.

Trees: *Acer campestre* („Nanum“, „Elsrijk“, *Acer platanoides* („Globosum“), *Betula pendula* („Fastigiata“, „Obelisk“), *Crataegus monogyna* („Stricta“, ‘Compacta’/‘Variegata’), *Crataegus × media* (‘Paul’s Scarlet’, ‘Rosea Plena’), *Carpinus betulus* („Columnaris“, „Frans Fontaine“, „Fastigiata“), *Sorbus intermedia* („Brouwers“), *Sorbus aucuparia* „Fastigiata“, „Fingerprint“), *Quercus robur* („Fastigiata“), *Tilia cordata* („zelená Globe“, „Grüne Kugel“, „Pev Kronenberg“), *Fagus sylvatica* („Dawyck“, „Dawyck Purple“).

The original species of perennials in the northern part of Slovakia were recommended for the rock garden in the low stone wall: *Ajuga reptans*, *Aurinaria saxatilis*, *Campanula carpatica*, *Carex* sp., *Cymbalaria murowa* (*Cymbalaria mularis*), *Dianthus deltoids*, *Dianthus plumarius*, *Dryas octopelata*, *Festuca* sp., *Geranium sanguineum*, *Geum coccineum*, *Glechoma hederacea*, *Koeleria glauca*, *Lysimachia ummularia*, *Origanum vulgare*, *Potentilla neumanniana*, *Primula* sp. - *Pulsatilla vulgaris*, *Sagina subulata*, *Saxifraga* sp. (pôvodný druh), *Sedum Sempervivum*, *Sesleria albicans*, *Thymus serpyllum*, *Thymus vulgaris*, *Veronica prostrata*, *Vinca minor*, *Viola odorata*

Realization: 09-12/2021



Now: implementation of park trees, shrubs, workout playgrounds, dry hill wall



Pilot investment labelled by permanent plaque:



## 2.2. HOUSE OF CULTURE (DOM KULTÚRY)

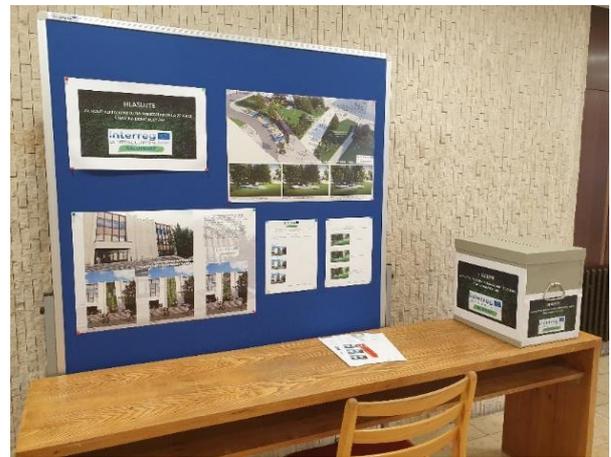
Exterior vertical vegetation wall at the House of Culture - the aim was to improve the microclimate, reduce overheating of the facade and thermal fluctuations of the perimeter wall, economic benefits of increasing the value of real estate and last but not least to create visual appeal of the House of Culture in Liptovský Mikuláš.

The old town is characterized by a deficit of greenery due to lack of vacant space. The project addresses the exterior overhanging vertical vegetation wall, including the irrigation system. The vegetation was realized on the western facade of the House of Culture in Liptovský Mikuláš. The design addresses the space of the niche in the perimeter wall on the right side of the main entrance to the building. This year-round green wall is also serving as a water retention measure to improve the climatic conditions of the urban environment. Plant species that are suitable for the western orientation were used for planting and were planted in plant boxes in order to create various areas where different shapes and colors of leaves are used. Individual plants are irrigated using automatic irrigation (the accumulation tank for excess water was discreetly located under the stairs).

The following requirements have been applied to the vegetation wall: it must be visually attractive all year round, designed so that it can be dismantled due to the possible thermal insulation of the building and easy to maintain. For the irrigation design, the requirement was to design an economically advantageous method of irrigation. In addition to the existing practice, it was a condition for the developer of the project documentation to make a visualization with three variant solutions of species planting in different colors. Visualizations of the plant wall filling had to be submitted to the city at the stage of development of the project documentation. For the Exterior Vegetation Wall at the House of Culture, variant solutions were proposed to be commented for the public, which were published on Facebook. The contracting authority made it possible to comment on alternative solutions to the public from 3 September 2020 to 14 September 2020 via Facebook as well as in person by inserting a ballot paper into the ballot box in the entrance hall of the municipal office. The designer incorporated the result of the public comment into the final design.

Selected architects (based on public procurement) prepared 3 alternative proposals (visualizations) of investment sites. Citizens (public) had the chance to vote for preferred proposal in form of voting on FB (just to give a “like”) and in form of voting paper in foyer of Municipality office of the City of Liptovský Mikuláš.





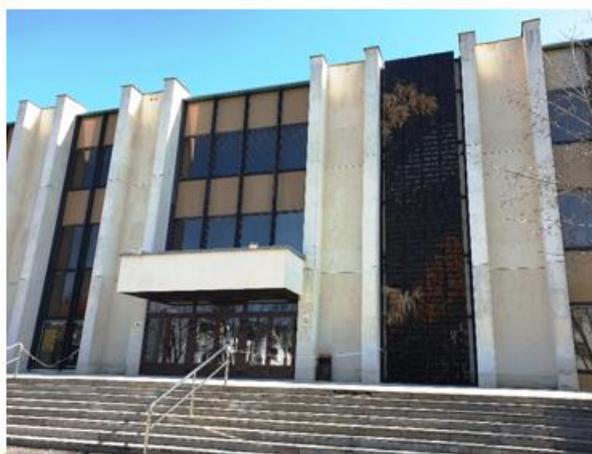
According to climate conditions, Knowledge partner - The Institute for Ecology of Industrial Areas (IETU) in Katowice (Poland) proposed following kind of plants that could be used:

It was recommended to use plants on a free-standing green wall. Planted plants: Hedera halix, Visteria sp., Parthenocissus sp., Lonicera caprifolium, Clematis vitalba.

**Realization: 09-11/2021**



**Now: vertical green wall on the House of Culture**



Pilot investment labelled by permanent plaque:



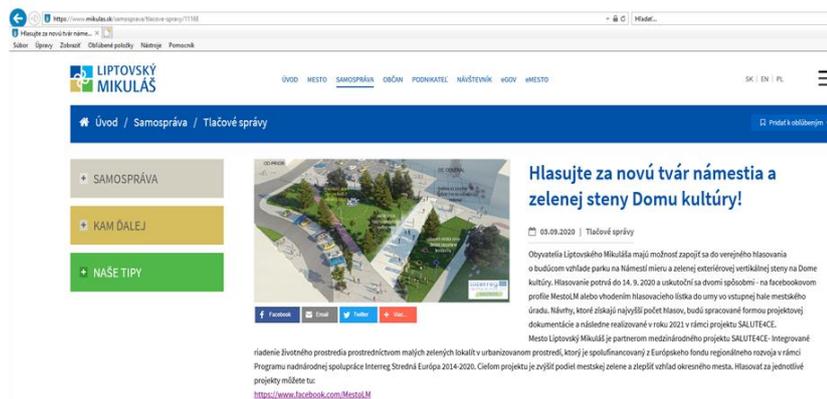
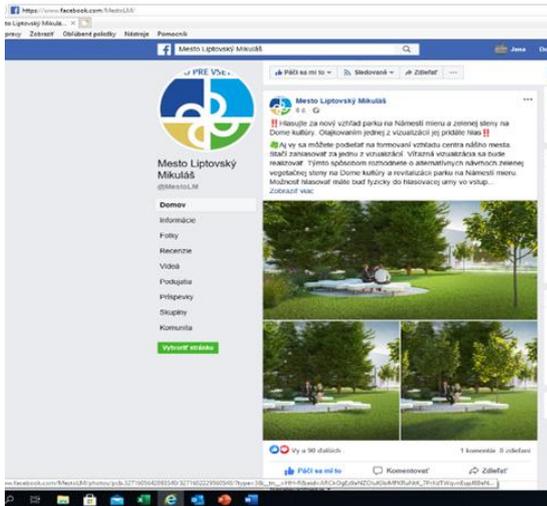
### 2.3. NÁMESTIE MIERU SQUARE

Revitalization of the park on Námestie Mieru - the aim was to build elements of green and blue infrastructure and reduce the overheating of paved areas, make the microclimate of the outdoor environment more pleasant and create an attractive space for relaxation for both adults and children in the central part of the city zone in Liptovský Mikuláš. There also was done a deepening of the spatial connection with the recreation areas at the neighboring shopping center.

As part of the revitalization of the Pedestrian Zone North - part of Park Námestie mieru, an effective element is a system of water jets with a high-pressure spray system, which spew out water vapor. This system is very favorable for the local microclimate and air improvement. The furniture consists of placing four benches in the central space of the park in a compositional set supplemented by newly planted trees. An attractive composition of benches was created by benches in which the seating area creates the shape of a puzzle. This rest area is located in the shade of trees. By installing recessed trampolines, a space have created for the little ones, which will support the digestion of children and their companions outdoors. Recessed trampolines were installed in the eastern part of the area between the cycle path and the main pedestrian corridor. In this part, there are already game elements of the Genius Park project, so we naturally supported the zone for children's visitors. As part of the new planting, nine pieces of deciduous trees were planted and ornamental beds with grasses, perennials and annuals were planted.

The requirement was applied that the project documentation should include visualization in three variant solutions. The processor was informed of the fact that the contracting authority will allow the public to comment on alternative solutions. The designer was obliged to incorporate the result of the public comment from the contracting authority into the final solution. The public voting on Facebook had an exceptionally large and positive response, the individual variant solutions of the green wall of the House of Culture and the revitalization of the park on Námestie mieru received a total of 2,900 votes.

Selected architects (based on public procurement) prepared 3 alternative proposals (visualizations) of investment sites. Citizens (public) had the chance to vote for preferred proposal in form of voting on FB (just to give a “like”) and in form of voting paper in foyer of Municipality office of the City of Liptovský Mikuláš.



EXTERIÉROVÁ VERTIKÁLNA VEGETAČNÁ STENA DOMU KULTÚRY	Variant 1	Variant 2	Variant 3	POČET HLASUJÚCICH PODĽA FORMY HLASOVANIA
Počet hlasov v urne vo vestibule radnice	6	5	21	32
Počet hlasov cez Facebook	228	148	1300	1676
<b>POČET HLASOV ZA VARIANTY CELKOM</b>	<b>234</b>	<b>153</b>	<b>1321</b>	<b>1708</b>

REVITALIZÁCIA PARKU NA NÁMESTÍ MIERU	Variant 1	Variant 2	Variant 3	POČET HLASUJÚCICH PODĽA FORMY HLASOVANIA
Počet hlasov v urne vo vestibule radnice	1	9	22	32
Počet hlasov cez Facebook	10	193	958	1161
<b>POČET HLASOV ZA VARIANTY CELKOM</b>	<b>11</b>	<b>202</b>	<b>980</b>	<b>1193</b>

According to climate conditions and evaluation of soil described in the introduction, Knowledge partner - The Institute for Ecology of Industrial Areas (IETU) in Katowice (Poland) proposed following kind of plants:

Grass: Festuca ovina

Planted flowers: Achillea millefolium, Allium schoenoprasum, Campanula rotundifolia, Dianthus carthusianorum, Dianthus deltoids, Euphorbia cyparissias, Hieracium pilosella, Hypericum perforatum, Linaria vulgaris, Linum perenne, Origanum vulgaria reflexo, Priane pulegioides, Thymus serpyllum

Realization: 09-12/2021



Now: Revitalization of park greenery, installing new urban furniture incl. recessed trampolines and atomizers of water fog



Pilot investment labelled by permanent plaque:



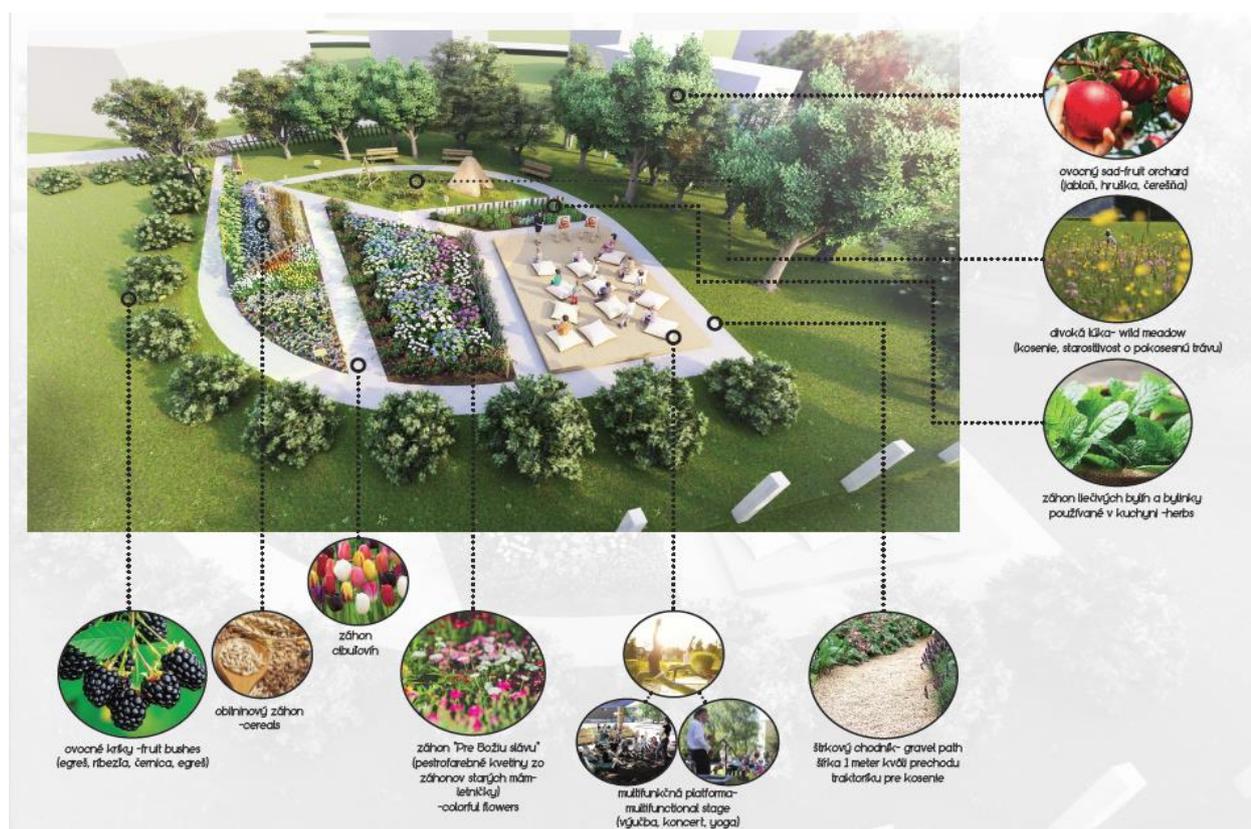
## 2.4. GRANDMAMA'S GARDEN

Grandmama's Garden - the goal was to build a rural orchard, which was in the past part of rural gardens and farmsteads, on suitable land on the school premises. The project, its design, implementation and sustainability, is part of the educational process of all subjects and all students of the school. It conditions the development of children's personalities in the perception of the country as a source of livelihood, contact with history, joy and pride in the results of their own work.

In order to involve the school's pupils in the process of preparation and creation of the project materials, it included this topic in the school's educational process. Through the pupils, the school was able to obtain as much information as possible about the use and management of the gardens in the time of the

"grandmothers", about the processing of the harvest from them. In this way, we managed to obtain a lot of materials from parents, grandparents, living experts in the form of photos, articles from magazines, statements of experts, data on originally cultivated species of useful plants and fruit trees. Pupils of schools, under the guidance of their teachers in the preparatory phase of the project (school year 2019/2020) prepared designs and model studies of old gardens and orchards according to students' ideas, which also included making houses for insects, birdhouses and others.

Originally unused garden thanks to the activities of pupils and teachers from primary school with kindergarten Demänovská Street created the first arboretum presenting traditional and typical trees, plants and flowers for the Liptov region - the so-called Grandma's garden. The shape concept of the architectural design consists in tracing the gravel sidewalk in the shape of a leaf and to create orchards on which various types of herbs, cereals, ornamental flowers typical of Liptov are grown and presented in the spirit of the old mama garden. From the north side, the sidewalk lined with an orchard. In the northeast corner of the orchard is complemented the still life created from the bushes of small berries. From the south side, a leaf-shaped sidewalk surrounds the shrub orchard. The sidewalks lead to a terrace that fulfills a multifunctional character. It provides space for immediate instruction directly in the grandmother's garden, offers space for small music meetings or yoga exercises during the summer months.



According to climate conditions and evaluation of soil described in the introduction, Knowledge partner - The Institute for Ecology of Industrial Areas (IETU) in Katowice (Poland) proposed following kinds of plants: You can choose only those varieties of fruit trees that are traditionally grown in Slovakia, adapted to the local climate. Preference is given to trees that do not reach large dimensions and fruits that are harvested outside the school holidays. Plants planted: *Malus domestica* (apple): solivar noble, batul, virgin Czech, Sudeten reneta, *Pyrus communis* (pear): president mas, brine, eliska *Prunus cerasus* (cherry): Vanda, Karesova, Techlovan. Fruit bushes that were used: *Corylus avellana* (hazelnut), *Ribes grossularia* (gooseberry), *Ribes rubrum* (red currant) *Ribes nigrum* (black currant).

**Realization: 08-10/2021**



Pilot investment labelled by permanent plaque:



### 3. EXPECTED IMPACT AND BENEFITS OF THE REALIZED PILOT ACTIONS FOR THE CONCERNED TERRITORY AND TARGET GROUPS AND LEVERAGE OF ADDITIONAL FUNDS

The general benefits of green acupuncture were taken into account for the selection of sites:

- offering a nature-friendly solution to the problems of the built-up area
- gaining a more positive identity of the city
- increasing the multi-functionality of public spaces
- creating sites for spending free time and increasing the social integration
- visual enrichment of spaces in the city through elements of blue and green infrastructure
- availability of quality areas of public greenery and creation of a green network in the urban structure
- mitigate the impacts but also the causes of climate change
- mitigating the effect of urban heat islands
- positive effect on rainwater runoff
- creating conditions for biodiversity
- improving air quality and microclimate in the urban environment
- requires relatively low costs outcomes
- provides a long-term effect

Benefits of green acupuncture by type of investment:

- the revitalization of the public space in the central zone increased its social character and the new aesthetic quality of this important space by using design elements, effective water elements and attractive children's elements
- in the case of green walls, in addition to ecological positives, it is also possible to protect the building against overheating of the facade in summer and excessive cooling in winter, humidification, protection against smog, capture and filtration of flying dust and pollutants, CO2 binding and oxygen production, rainwater capture in the exterior and reducing the outflow into the sewer, increasing the diversity of plant species in the city, protecting the facade against graffiti

- In the case of internal block spaces of apartment houses, it is possible to create community spaces as the only type of collective space within mass housing construction and compensation of the green deficit and lack of small functional areas with a pleasant microclimate and attractive green environment
- the garden on the school area has an educational character

#### 4. SUSTAINABILITY OF THE PILOT ACTION RESULTS AND TRANSFERABILITY TO OTHER TERRITORIES AND STAKEHOLDERS

The main objective of proposing and carrying out green acupuncture investments activities was to improve the climate resilience of cities and support ecosystem services. Investment activities in an urban environment are associated with the water management and water regime of the given land, with biodiversity and ecosystems, and with care for population's health.

According to The Letter of Commitment, the city of Liptovský Mikuláš express the will of co-operation in the field of further strengthening of green and blue infrastructure in this area. The city aim at protection and development of natural resources by the integrated environmental management of green and blue infrastructure with planting native and climate resistant vegetation in small spots selected all over the whole functional urban area. The effect was in enlargement of natural resources, including native species and climate resistant plants suitable to local conditions. Also the natural capital was enhanced by improving local climate and strengthening FUAs area resistant to climate change.

According to the Action Plan of the city of Liptovský Mikuláš the following documents for the purpose of efficient and sustainable urban greenery management are recommended to be prepared: Woody Plants Maintenance Document, Regional Territorial System of Ecological Stability / Local Territorial System of Ecological Stability, Climate Change Adaptation Strategy for the town.

Pilot activities are sustainable and there is the possibility of replication in other areas and among other stakeholders. The need, suitability and sustainability criteria were applied in the individual stages of the Action Plan's creation in the context of current and expected (future) conditions. The local stakeholders were consulted to ensure correct interpretation of the data on the state of FUAs and acupuncture sites. Thanks to this step, the stakeholders (e.g. residents, representatives of public administration, etc.) have had an impact on shaping the area, where they are living (e.g. citizens have specified where exactly they want to place the trees, benches, etc.).

#### 5. LESSONS LEARNED AND ADDED VALUE OF TRANSNATIONAL COOPERATION OF THE PILOT ACTION IMPLEMENTATION

In many EU cities it is difficult to save large areas for planting greenery. The attractive sites are often used for settlements or investments which provide profits for the city budget. On the other hand authorities of the cities are aware of the necessity for green spaces to inhabitants for many reasons. Not only needs for rest, recreation and aesthetic surroundings but also growing requirements for adaptation of urban areas to climate change. The international cooperation has shown that the problems do not only exist in Slovakia.

This urban environmental challenge needs a special solution offered by SALUTE4CE project. The main objective of SALUTE4CE was protection and development of natural resources by the integrated environmental management of green & blue infrastructure with planting native and climate resistant vegetation in FUAs lacking large sites for this function. The project will improve capacities of the public sector and related entities in management of green & blue infrastructure in FUAs by using the small spots not attractive for other purposes. The project partnership will implement the concept of urban environmental acupuncture (UEA) consisting in a surgical and selective intervention into the urban environment, instead of large scale projects that involve thousands of hectares and tremendous costs. The numerous interventions in many small spots in a FUA can provide an effect for the FUA as a whole. The

partnership will develop the common methodology and criteria of selecting both spots and types of interventions which then will be applied in elaborating action plans for 4 FUAs. These action plans will demonstrate the application of the idea of UEA as an effective and innovative way of integrated environmental management in FUA to make it more livable place. Pilot actions in the project will show in form of small investments in 4 FUAs how to implement step by step the idea of UEA. The trainings and the project handbook on UEA as well as tools for residents' involvement will provide a transnational added value of the project. The project has showed how important it is to involve citizens and residence in the process. We can see that a suitable solution to a problem can be found by a meaningful discussion.

The steps described above have been implemented on the basis of knowledge and experience of the leading partner of the project - the Institute for Ecology of Industrial Areas-IETU Katowice and the project coordinator of the Institute for Sustainable Development of Settlements-IURS Ostrava. Support for our local government was provided by these organizations in the form of consultations, where they provided us with their knowledge and experience in using various methods and tools for faster efficiency and implementation of activities in environmental management.

## 6. CONTRIBUTION TO/ COMPLIANCE WITH

Analysis of strategic documents in relation to the SALUTE4CE project in Liptovský Mikuláš:

- Territorial plan of Liptovský Mikuláš (2010), as amended by amendments and supplements No. 1-6 (Aurex spol. S.r.o.),
- Economic and Social Development Programme of Liptovský Mikuláš for the 2015 - 2022 period, with an outlook for 2030 (Municipal Authority of Liptovský Mikuláš, 12/2015),
- General Transport Plan of Liptovský Mikuláš (Dopravoprojekt, a.s., Bratislava; HBH Projekt, spol. s.r.o., 06/2008),
- Regional Territorial System of Ecological Stability of the District of Liptovský Mikuláš (2013),
- Climate Change Adaptation Strategy of the Slovak Republic (Ministry of Environment of the Slovak Republic, 2018 update)

The vision and objectives of the Liptovský Mikuláš FUA and the interest area are formulated based on a document entitled "Economic and Social Development Programme of Liptovský Mikuláš for the 2015 - 2022 period, with an outlook for 2030 (Municipal Authority of Liptovský Mikuláš, 12/2015). The main objectives and priorities of the town's development take into account its specific internal characteristics, and observe principles of regional policy with the aim to achieve balanced and sustainable development of the area.

The project SALUTE4CE complies with the strategic documents of the given Functional Urban Areas and with Slovak and EU legislation.