Chişinău

- The Green Structure of a City in Transition

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SUMMARY

The Republic of Moldova is not very well known among people living in the rest of the world. It is a rather small country and its borders are not more than 20 years old. As a former part of the Soviet Union it is a country in transition. This transition is present at many levels, not only from a planned economy to a market economy and a wish to become a part of the European Union, but also in the way of thinking, which include city planning. This master thesis is a result of a twinning agreement started in 2009 between Borlänge and Chişinău municipalities, where both sides realised the need of a Green Structure Plan in Chişinău. The aim of this master thesis is to produce a Green Structure Plan for the capital city, Chişinău. The plan is based on sustainability from an ecological, social, and to some extent economic perspective, and it gives the answer to what a Green Structure Plan is and how it can be used as a tool for sustainable urban development. Further, it investigates how a Green Structure Plan can be applied to the city of Chişinău.

The work with this master thesis has passed through four phases: preparations, an eight week long field study, processing of the gathered material, and proposal. During the inventory and analysis phase a range of different methods were used to get as a diverse and precise perspective of the city as possible. The methods we have used for the inventory are: literature studies; a case study of Borlänge Green Structure Plan; site visits, observations and photography; studies of maps and plans; interviews; and a public workshop with citizens. Methods used for analysis are SWOT-analysis, Lynch-analysis, and Patrik Grahn's eight park characters.

One of the greatest challenges of today's society is to achieve sustainable urban development. The values of environment, nature, and culture need to go hand in hand with values from a social and economic perspective. The preconditions to create enduring sustainable development of the urban environment are to a great extent determined by how the built environment is preserved and developed (Boverket 1999, p.12). Chişinău has great potentials for connected green structures with high economic, social, ecological and cultural values. There are vast green spaces in the suburbs and a river floating through the city. Also, the city is connected with the only larger forest area left in the country, Codrii forest. However, fractioning of green links, increased traffic, lack of finances for maintenance, pollution, and unregulated growth within green areas are threats to green spaces today. For a sustainable development of the city these threats need to be adjusted. Also, it is important to keep the historic traces and the identity of green spaces as they are important factors from a social and cultural perspective.

We have partly based our project proposal on the General Urban Plan for Chişinău from 2004. New ring roads are planned within and outside of the city to handle the traffic situation. Our first proposal concerns the management of increased amounts of traffic in the city, where the purpose is to protect the existing green links and encourage a more sustainable network of transportation.

Inventories, analysis and proposals are also made for existing park areas within Chişinău. People use these spaces as their living rooms. Older men play chess, ladies talk, and young couples sit on benches. There are three types of green space in Chişinău; public gardens, parks and forest-parks. Due to similar maintenance, character and function some of these areas are not used according to their potential. We have offered a new way of categorising green spaces according to Uppsala's park program, based on the existing classification in Chişinău. We believe a diversification of the maintenance, function, and character of green spaces will create more efficient use and increase the value of the green space, since more people will have the opportunity to find a park suitable for their needs.

Also, we have focused on the River Bîc which is a backside and barrier today going through the city. The river is regularly flooded which affects big parts of the city, and is threatened by pollution from domestic and industrial waste. However, it does have great potential as a blue-green spine through the city, becoming a public blue-green parkway. To decrease the frequent risk of floods, a plan has been made by the Water Management projecting Institute, Acvaproiect, where the river is broadened, slopes are reinforced with concrete and where the water flow is controlled by valves. In comparison, our suggestion is to prevent flooding in a more natural way, going back to the original meandering shape of the river. If slopes are stabilised by planted vegetation new habitats will be created, supporting the local flora and fauna. Also, a flood plain can prevent flooding as well as becoming a recreational parkway and tourist attraction.

This thesis should be seen as a first step towards the sustainable development of Chişinău. Further inventories and analysis are needed in order to comprise all green space in Chişinău. We have provided an example of how to include economic, ecological and social factors when planning for the green structure through added habitats for the native flora and fauna, reinforced green links, increased quality of public green spaces, and a sustainable transportation network. The economic investment needed is high, but simultaneously it provides an opportunity to make a long-term profit through the improvement of people's health and life quality, by attracting tourists and business investors, and by stabilizing the ecological system in Chişinău.

Republica Moldova nu este foarte cunoscută celor ce trăiesc în afara acesteia. Este o țară relative mica iar granițele sale au fost stabilite de-abia acum 20 de ani. Ca fostă parte a Uniunii Sovietice, este o țară în stare de tranziție. Această tranziție se resimte în mai multe planuri, nu numai în ceea ce privește trecerea de la o economie planificată la una de piață, și din punctul de vedere al dorinței de aderare la Uniunea Europeană, ci de asemenea în privința mentalității, inclusiv urbanistica. Această teză de master este rezultatul a unei convenții de înfrățire din 2009 între municipiile Borlänge și Chișinău, care au realizat importanța unui Plan Urbanistic Verde în Chișinău. Scopul acestei teze de master este de a produce un Plan Urbanistic Verde pentru capitala țării, Chișinău. Planul este bazat pe sustenabilitate ecologică, socială, și chiar economică, în același timp răspunzând la întrebarea: Ce este un Plan Urbanistic Verde și cum poate fi folosit ca unealtă pentru dezvoltarea urbană sustenabilă? Mai mult, acesta analizează cum se aplică un Plan Urbanistic Verde Chișinăului.

Munca depusă pentru crearea acestei disertații a avut trei etape: pregătirea, studierea domeniului timp de opt săptămâni, și procesarea materialului adunat. În timpul fazei de inventariere și analiză au fost folosite diverse metode pentru a obține cât mai multe perpective diverse și precise cu putință. Metodele folosite pe parcursul inventarierii sunt: analizarea literaturii de specialitate; un studiu de caz asupra Planului Urbanistic Verde a orașului Borlänge; vizitarea, observarea și fotografierea locurilor; studierea hărților și a planurilor; interviuri și sondaje; și un workshop public la care au participat cetățeni ai orașului. Metodele folosite în cadrul etapei de analiză sunt: analiza SWOY, analiza Lynch și cele opt caracteristici ale parcurilor de Patrik Grahn. Una din cele mai mari provocări ale societății actuale este aceea de a obține o dezvoltare urbană sustenabilă. Valori precum: mediul înconjurător, natură și cultură trebuie să meargă mână în mână cu valorile sociale și economice. Condițiile prealabile pentru crearea unei dezvoltări sustenabile și durabile a unui mediu urban sunt în mare parte determinate de felul în care este conservat și dezvoltat mediul construit (Boverket 1999, p.12). Chișinăul are un potențial imens în ceea ce privește o structură verde conectată la valori sociale, culturale și ecologice înalte. Există spații verzi vaste în suburbii și un râu în interiorul orașului. De asemenea, orașul este conectat cu Pădurea Codrii, cea mai mare pădure rămasă pe teritoriul Republicii Moldova. Pe de altă parte, fracționarea elementelor verzi, traficul crescând, lipsa fondurilor pentru întreținere, poluarea și creșterea nereglementată a construcții nelegale din spațiile verzi sunt o amenințare creascândă. Pentru o dezvoltare sustenabilă a orașului aceste amenințări trebuie să fie ajustate. De asemenea, este important să păstrăm urmele istoriceși identitatea spațiilor verzi deoarece acestea sunt imporante pentru o dezvoltare socială și culturală sustenabilă.

În parte, ne-am bazat proiectul pe Planul Urbanistic General pentru Chișinău din 2004. Pentru a face față traficului, au fost planificate noi ronduri atât în oraș, cât și în afara lui. Prima noastră propunere vizează gestionarea traficului crescut în oraș, în același timp protejând elementele verzi existente și încurajând o rețea de transport mai sustenabilă. De asemenea, ne-am concentrat asupra Râului Bîc, care actual constituie spatele și o barieră ce traversează orașul. Râul prezintă un risc crescut de inundații precum și de poluare din surse domestice și industriale. Totuși, are un mare potențial de a fi esențial în planul orașului, devenind un loc verde de promenadă. Pentru a scădea riscul inundațiilor ce au loc odata la 30-50 de ani, Acvaproiect, Institutul de Proiectare a Sistemelor de Gospodarire a Apelor, a creat un proiect conform căruia râul va fi lărgit, malurile ranforsate cu beton, iar debitul apei controlat prin intermediul unor valve. Prin comparație, sugestia noastră este aceea de a preveni inundtațiile într-un mod mai natural, întorcând râul la forma sa șerpuită inițială. Dacă malurile sunt stabilizate prin plantare de vegetație, vor fi create noi habitate, astfel adăpostind și sprijinind fauna și flora locală. De asemenea, o luncă ar putea preveni inundațiile, în același timp devenind un spațiu verde destinat recreerii și o atracție turistică.

De asemenea se fac inventarieri, analize și propuneri parcurilor existente de pe teritoriul Chișinăului. Oamenii folosesc aceste spații pentru diverse activități. Bătrânii joacă șah, femeile stau de vorbă, și cupluri tinere stau pe bănci. Există trei tipuri de spații verzi în Chișinău: grădini publice, parcuri și păduri-parc. Din cauza îngrijirii, caracterului și funției asemănătoare, unele dintre acestea nu sunt folosite la adevăratul lor potențial. Am propus un nou mod de a categoriza spațiile verzi conform programului pentru parcuri Uppsalei, bazat pe o clasifiacre deja existentă în Chișinău. Noi credem că o diversificare a modului în care sunt îngrijite, funției și caracterului spațiului verde va crea valorificarea mai eficientă a spațiilor verzi, oamenii având șansa de a alege parcul potrivit nevoilor fiecăruia.

Această teză ar trebui văzută ca fiind un prim pas spre o dezvoltare sustenabilă a Chișinăului. Inventarieri și analize ulterioare sunt necesare pentru a acoperi întregul spațiu verde al orașului. Noi am oferit un exemplu de includere a factorilor economici, ecologici și sociali în planificarea structurii verzi a orașului prin adăugarea de habitate pentru dezvoltarea florei și faunei, consolidarea elementelor verzi, îmbunătățire a calității spațiilor publice verzi și o rețea de transport sustenabilă. Investițiile de ordin economic necesare asigură o sursă de profit pe termen lung prin îmbunătățirea sănătății și calității vieții oamenilor, prin atragerea turiștilor și a investitorilor, și prin stabilizarea sistemului ecologic în Chișinău.

SAMMANFATTNING PÅ SVENSKA

Republiken Moldavien ligger mellan Rumänien i väst och Ukraina i öst, nära Svarta Havet med endast 900 meter kuststräcka. Huvudstaden heter Chişinău och ligger mitt i landet. Moldavien var en Sovjetrepublik under 46 år men blev en självständig republik 1991. Detta gör att dagens nationsgränser endast funnits i 20 år. Landet genomgår ett skifte från planekonomi till marknadsekonomi med fokus på medlemskap i Europeiska Union, men det sker också en omställning gällande tankesätt inom stadsplanering. Mark privatiseras, intresset för att bo i villa med egen trädgård är stort och bilberoendet har ökat de senaste åren, och trots emigration breder städerna ut sig. Skiftet innebär att stadsplanerare frångår det sovjetiska planidealen och fokuserar mer på västerländska lösningar och tankesätt.

Syfte och mål

Sverige har sedan 2004 en samarbetsstrategi med Moldavien där fokus ligger på Moldaviens vilja att integreras med EU. Samarbetsstrategin innefattar tre sektorer där hållbar samhällsbyggnad är ett av målen. Utöver denna samarbetsstrategi startade Chişinău kommun och Borlänge kommun ett vänortssamarbete 2009 genom vilket båda parter insåg behovet av en plan för grönstrukturen i Chişinău. Målet med detta examensarbete är att skapa ett förslag till grönstrukturplan för huvudstaden, med utgångspunkt i social, ekologisk och till viss del ekonomisk hållbarhet. Frågor som arbetet kommer att besvara är: vad en grönstrukturplan är, hur den kan användas som ett verktyg för hållbar stadsutveckling, samt hur en grönstrukturplan kan appliceras på Chişinău.

Metod

Detta examensarbete har passerat fyra faser: förberedelser, en åtta veckor lång fältstudie, bearbetning av framtaget material, samt utvecklandet av ett planförslag. För inventering och analys, främst under fältstudien, använde vi oss av ett antal metoder för att få ett så brett och sanningsenligt perspektiv av staden som möjligt. Använda inventeringsmetoder inkluderar litteraturstudier, fallstudier av Borlänge grönplan och Uppsalas parkprogram, platsbesök, observationer, fotografering, studier av plan- och kartmaterial, intervjuer och en workshop för allmänheten i Chişinău. SWOT-analys, Lynch-analys and Patrik Grahns åtta parkkaraktärer har använts som analysmetoder.

Hållbar stadsutveckling

Idag står vårt globala samhälle inför stora utmaningar där hållbar stadsutveckling är ett av de mest akuta problemen att lösa. Värden gällande miljö, natur, och kultur måste utvecklas parallellt med sociala och ekonomiska värden. Sättet på vilket den byggda miljön är bevarad och utvecklad avgör till stor del framgången av en hållbar utveckling av urbana miljöer (Boverket 1999, s. 12). Chişinău har stora förutsättningar för en framtida sammanhållen och länkad grönstruktur, med höga sociala, kulturella och ekologiska värden. Staden har stora grönområden i förorterna, en liten å, Bîc, som rinner genom staden, från norr till söder, och är länkad till det enda sammanhängande skogsområdet, Codrii, som fortfarande existerar i landet. Existerande skogsområden i stadens närområde är dock fragmenterade och jordbruksaktivitet är ett överhängande hot för ytterligare minskning av skog i dessa områden. På grund av, bland annat, ökad trafik, föroreningar, oreglerad tillväxt av bebyggelse, och små ekonomiska resurser för förvaltning av grönytor, hotas grönytor av minskning och förlorad kvalitet. Existerande gröna länkar riskerar även att brytas av nya vägar och bebyggelse. För att uppnå en ekologiskt, socialt och ekonomiskt hållbar utveckling i Chişinău bör dessa tendenser förhindras och beaktas på planeringsnivå.

Historiska lager

Under inventeringen av staden framkom tydligt fyra huvudsakliga historiska lager. Centrum består av två delar, där den ena delen utvecklats från medeltiden till tidigt 1800-tal. Här är gatustrukturen oregelbunden och bebyggelsen består till största delar av äldre lägre bebyggelse. Den andra delen revs och utvecklades 1812 då Moldavien var ockuperat av det Ryska imperiet. Den består av ett rutnätssystem med tvåvåningshus. Under Sovjettiden utvecklades satellitstäder i stadens förorter med tidstypiska höghus i betong. Mellan satellitstäderna anlades enorma parker planerade för sportaktivitet och rekreation. Under och efter Sovjetunionens fall har villaområden utvecklats fritt där möjlighet funnits, vilka symboliserar dagens bostadsbyggande. Dessa historiska lager är viktiga som identitetsskapande faktorer i staden och därmed nödvändiga ur ett socialt och kulturell hållbarhetsperspektiv.

Befintlig översiktsplan

Arbetet är delvis baserat på Översiktsplanen för Chişinău från 2004. Enligt denna finns det planer på att bygga tre ringvägar igenom och runt om staden för att hantera ökad trafik från en tänkt passerande europaväg. Vårt första förslag är ett alternativ och komplement till dessa ringvägar där delar av ringvägarna ersätts med miljövänlig kollektivtrafik för att skydda existerande gröna länkar inom staden och till det omgivande landskapet. Idag används kollektivtrafiken flitigt av Chişinăus invånare varför en utveckling av kollektivtrafiken har potential att ersätta stora delar av biltrafiken inom staden.

Grön infrastruktur/parker

Chişinău har ett stort antal grönområden med betydande storlek vilka idag är indelade i tre parktyper. Indelning motsvarar den sovjetiska parkindelningen och innefattar offentliga trädgårdar, parker, och skogsparker, vilket är kopplat till hur de förvaltas. De offentliga trädgårdarna finner man i de mer centrala delarna av staden och utgörs av mindre vegetationsrika grönytor med dekorativa planteringar. Den ska vara över 20 hektar stor och dessa platser har högt underhåll. I den offentliga trädgården ska den närboende ha möjlighet till daglig rekreation och vila. Här ska man kunna sporta eller ägna sig åt fritids- och kulturaktiviteter. Skogsparken kräver lägre underhåll och är mer opåverkade naturskogar, innehållande skog och vatten. Dessa områden är anpassade för friluftsliv som camping och vandring. Vid inventeringen fann vi att grönytorna inte används enligt dess planerade potential på grund av likartad förvaltning och ensidigt utbud. Människors krav på grönytorna genomgår precis som landet en förändring och nya möjligheter och aktiviteter behöver utvecklas. Föreslaget är ett antal nya parkindelningar utifrån Uppsalas parkprogram, vilket innebär en utveckling av och ett komplement till den indelning som finns.

Den nya parkindelningen innefattar stadsparker, stadsdelsparker, kvartersparker, småparker samt natur i staden. Den ökade mångfalden medför en mer varierad förvaltning, funktion och karaktär i parkerna som gynnar det sociala, såsom det ekologiska livet. Värdet av grönytorna i staden ökar om de skapar möjlighet att användas på fler sätt av fler människor.

River Bîc

Genom staden rinner en liten å, Bîc. Vi har valt att göra en mer detaljerad inventering, analys och förslag för denna å, då vi vid inventering och analys av hela staden såg att detta är ett område med stor utvecklingspotential. Idag är ån en baksida och barriär genom staden trots dess centrala läge, 1500

meter från den centrala boulevarden Ştefan cel Mare. Den utgör även ett hot mot stora delar av staden då den regelbundet översvämmas. Det historiska centrumet är särskilt hotat då det är beläget i översvämningsområdet. Stora delar av ån är omgiven av industriområden, vilket gör att Bîc är väldigt utsatt av föreoreningar från industri- och hushållsavfall som dumpas direkt i ån eller tillförs via biflöden. Trots detta har ån stor potential som en grön och blå länk som förbinder existerande grönområden i staden. Det statliga projekteringsinstitutet för vattenhantering, Acvaproiect, har planer för en revitalisering av ån för att förhindra översvämning och erosion. Förslaget innebär att ån breddas och renas, förstärks med betong, samt att vattenflödet kontrolleras genom vattenslussar.

Efter en intervju med [6]Martyn Futter på institutionen för vatten och miljö på Sveriges Lantbruksuniversitet föreslår vi ett mer naturligt sätt att förebygga översvämning av ån. Vårt förslag innebär att floden får en meandrande form, som den en gång haft, och att slänterna stabiliseras med hjälp av träd och buskar. En kombination av den meandrande formen, växter som renar vatten från föroreningar och ett utveckla system för omhändertagande av dag- och avloppsvatten, är förutsättningen för en ren å och skapandet av nya habitat för stadens flora och fauna. Med anlagda gång- och cykelvägar utmed ån skulle den kunna bli ett parkstråk uppskattat av Chișinăus invånare och besökare.

Diskussion

Syftet med denna studie var att lägga fram ett förslag till en grön struktur plan för Chișinău, grundad på hållbar utveckling ur ett socialt och ekologiskt, och i viss mån ekonomiskt perspektiv. Chișinău har stora möjligheter när det gäller grönstrukturen, beroende på storlek och läge varför vi anser att detta mål kan nås med ganska små medel. Eftersom landets ideal är i förändring, med fokus på västerländsk standard när det gäller ekonomi, politik och kultur, följer ett nytt sätt att använda det offentliga rummet. Den äldre generationen, uppvuxen under sovjettiden, använder parkerna för motion, möten och som en förlängning av deras vardagsrum, medan den yngre generationen har andra krav på dessa grönområden. Enligt våra observationer och intervjuer, vill unga människor ha möjligheten att använda parkerna på ett mer fritt och mångsidigt sätt, att till exempel kunna spela fotboll, åka skateboard eller roller-skate samt ta en kaffe eller en måltid i parken. Baserat på historia, identitet och befintliga funktioner hos Chisinaus grönområden, ser vi möjligheten till en mer varierad användning där olika generationer kan mötas, om nya parkkaraktärer och funktioner läggs till.

Eftersom Chișinău ännu inte har stört de befintliga gröna länkarna och kilarna, finns det en möjlighet att använda dem för att uppnå motståndskraft mot klimatförändringar och risken för degradering av värdefulla ekosystem. Men för att nå dit behöver den befintliga gröna strukturen rengöras från föroreningar och en mångfald av inhemska arter återetableras, samt etablering av något som har förmåga att locka den yngre generationen. Det finns också en stor möjlighet att vända floden Bic till ett attraktivt offentligt grönområde. Detta skulle kunna bli en turistattraktion och en ekologisk korridor som kopplar samman befintliga grönområden i staden.

Värdet av grönområden måste erkännas för att de ska kunna skyddas mot exploatering i kombination med en uppföljning av dagens ambitiösa regelverk gällande miljön. En hållbar utveckling av Chișinău skulle ytterligare uppmuntras med ett väl utvecklat miljövänlig nätverk av kollektivtrafik samt gång- och cykelvägar som förbinder östra och västra delen av staden och förorterna.

Första steg

Detta examensarbete bör ses som ett första steg mot en hållbar grönstrukturplanering i Chișinău. Vidare inventering och analys bör utföras för att täcka alla gröna ytor i staden. Vi har utvecklat ett exempel på hur ekologiska, sociala och ekonomiska faktorer kan inkluderas inom grönstrukturplanering, genom ett nyskapande av habitat för inhemsk flora och fauna, förstärkta gröna länkar, ökad kvalitet av offentliga grönytor, samt ett hållbart nätverk av kollektivtrafik. Nödvändiga ekonomiska investeringar kommer att innebära långsiktiga vinster i form av ökad hälsa och livskvalitet hos populationen, ökad attraktivitet för turister och affärsinvesterare, och genom ett stabilare ekologiskt system.






Dessa sex visualiseringar visar vår vision för det första steget i den framtida utvecklingen av den blå-gröna strukturen i Chisinau. En ny stadspark, nya noder samt gröna stråk som bidrar till sociala, ekologiska och ekonomiska vinningar.

[6]Martyn Futter, Department of Aquatic Sciences and Assessment at the Swedish University of Agricultural Science, meeting 7 March 2012.

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BACKGROUND

INTRODUCTION

This chapter contains a short introduction to the subject and explains under what conditions this master thesis were carried out. Here you find the problem formulation, the aim and intent, our target group, the limitation of the work, as well as the disposition of the thesis to ease orientation.

The Republic of Moldova is a rather small country and its borders are not more than 20 years old. As a former part of the Soviet Union it is a country in transition. This transition is present at many levels, not only from a planned economy to a market economy but also in the way of thinking, including city planning. When Romania became a part of European Union, The Republic of Moldova was involved in the Neighbouring Program. This program is a way for Moldova to come closer to the European Union through strategic objectives. One of these objectives requires involvement in the management of land administration in the context of natural conservation and environmental protection (European Commission, 2012). As a step towards the EU membership, Moldova signed the European Landscape Convention which entered in to force in March 2004. Also, a main goal from the present general plan 2004-2025 is to make Chişinău an attractive area for its citizens and for future investments from the private sector. In this general plan some of the ecological values are considered, but no one has looked at the green areas with the eyes of a landscape architect. The municipality is on the right track and with this master thesis we would like to provide our contribution to the development of this city.

Why this thesis?

Sweden started development cooperation with Moldova in 1996 and is the biggest bilateral donor after the US. Since 2007 the support has been focused on Moldova's will to approach the European Union which is important for the future development of the country. According to the cooperation strategy for 2011-2014, approved by the Swedish government in February 2011, interventions are focused on democracy, human rights and equality, market development and sustainable city planning (Utrikesdepartementet, 2008).

As a part of the Swedish development cooperation with Moldova, the municipality of Borlänge and the municipality of Chişinău signed a twinning agreement in 2009. The agreement includes an exchange of experiences and information between the municipalities (Hagberg, A. 2009). For example there have been several students writing their masters in Moldova about renewable energy. The previous focus on the energy sector can be explained by the close relationship between the municipality of Borlänge and the energy company called Borlänge-Energi. Within the next few years sustainable city planning will be in focus and the idea to make a green structure plan for Chişinău developed from both sides of the twinning agreement. As about 90% of the area in Moldova is homogenous cultivated land, the remaining green structure is of great importance for a sustainable development, ecologically and socially. Green areas can have recreational purposes as public parks, be cultivated as allotments, become integrated with sport activities and playgrounds, become meeting places, attract tourists, be a representative front and/or provide the city with a natural reserve for today's and future generations.

Aim

The aim of this master thesis is to produce a proposal for a Green Structure Plan for the capital city, Chişinău. The plan will be based on sustainability from an ecological, social, and to some extent economic perspective. It will propose how the existing green spaces can be preserved and linked, and where new green areas can be developed to strengthen the local ecosystem. The plan will also propose new public places for people living in and travelling to Chişinău.

The thesis gives the answer to what a Green Structure Plan is and how it can be used as a tool for sustainable urban development. Further, it investigates how a Green Structure Plan can be applied to the city of Chişinău.

Target group

This thesis is primarily written for the municipality of Chişinău, as a tool and guide for further development. It can also be used by students or professionals interested in green structure planning, The Republic of Moldova and/or how transition of Post-Soviet cities affects the green structure.

Limitations

This thesis is based on an eight weeks long field study in Chişinău. Most of the research required for the project including inventories, analysis, and interviews had to be done during this short period of time. Due to the restricted time, three main parts of a Green Structure Plan were chosen for investigation.

Firstly, we studied the existing planning documents and how the infrastructure connects to the green space on a more comprehensive scale. We did not consider more detailed land use planning on this comprehensive scale. Our proposal on Ecoduct and bridges for green passages needs further technical investigation for their ability to withstand earthquakes.

Secondly, inventories and analyses were made of the public gardens, parks and forest-parks, with the central part of the city having highest priority. We made inventories of surrounding land use, functions and activities, maintenance, size and location. Inventories were not made of single species of vegetation, movement patterns, or park areas seeming unsafe. We avoided, by recommendation, some abandoned park areas due to stray dogs and all green areas after nightfall. Further, we excluded green thoroughfares, green within micro-districts and squares, due to time limitation.

Thirdly, the River Bîc was chosen as a focal point to make an example of how a Green Structure Plan can be taken one step further, also, because the river and the area around it serves a great potential for the development of the city. No inventories of single species of vegetation were made due to time limitation and lack of accessibility. In the end the proposals are presented as a strategy, tied together in a vision to illuminate the first necessary steps of green structure development in Chişinău. This work is to be seen as a foundation for further development.

Disposition

The Green Structure Plan is divided into four chapters. The first chapter, Background, includes background information about green structure planning, general information about the value and character of green space, and climate change. In the second chapter, Site Description, we describe the history and environmental conditions of Chişinău, and the planning framework of green space. In the third chapter we present the results of the inventories and analysis. This chapter is divided into three parts. In the first part we consider the whole city, the second part concerns the existing public gardens, parks and forest-parks, and the third part presents our focus area, River Bîc. In the fourth chapter, Proposal, we present a strategy for the green links and infrastructure, park management and revitalization River Bîc. We then present a first step with visualisation of a principle, as a summary of our main ideas, for a future sustainable development of Chişinău. The final chapter includes discussions, reflections and the bibliography.

METHOD

In this chapter you find the description of all methods that were used during the work with this master thesis, together with presentations of the people that were interviewed in this study. The method chapter also presents used definitions and abbreviations.

This thesis is based on an empiric qualitative study of the public space of Chişinău. The work has passed through four major phases: preparation, field study, processing of the gathered material and then the proposal. During the inventory and analysis a range of different methods were used to get as diverse and precise of a perspective on the city as possible. When different methods are combined in a study it is itself a method called method triangulation (Johansson 2005, p.31). The benefits from combining different methods are when a case needs to be illuminated from altered perspectives. It gives a more clear and accurate picture of the studied object- Chişinău in this case. For example, during the field study in Chişinău we interviewed residents as well as experts in the field of city planning, made observations about the green areas of the city, the traffic situation, the central river, and the people. But, at the same time, current maps and plans of the city were studied. Finally, we used sketches to visualise the result from the inventory and analysis as a future plan for the city.

Literature studies

During the preparatory research in advance of the field study we read almost all literature to be found about The Republic of Moldova, in both English and Swedish. The reason was to get an overall picture of the country's history, economy, political context, and culture. After this was achieved the focus was set on local ecology, geology and subjects concerning city planning, sustainable development, green structure both in general and also local tendencies and regulations in Chişinău such as, the European Landscape Convention. Since Moldova had been a part of the Soviet Union the city planning was affected by city planning principles from Soviet times. To understand the city it is necessary to understand Soviet city planning strategies. Among the literature there is one book worth mentioning that to a great extent assisted with information about Chişinău city planning. This is the book written by Bo Larsson and Göran Skoog (2009), Multi-ethnic built heritage in west Ukraine and Moldova - a challenge for urban planning and development.

Case study

To understand what a Green Structure Plan is, an inductive case study (Johansson 2005, p.37) was preformed of the disposition, design and theory of Borlänge Green Structure Plan (Gunnars, L-E. 2002). The outcome was then modified to meet the scientific requirements from a master thesis, according to the Swedish University of Agricultural Science, before being applied to the context of Chişinău.

For inspiration on how to classify parks in different categories and to gain a good terminology the Parkprogram för Uppsala (Hermansson, Å. 2002) worked as platform. These categories were then combined with the classification of old Soviet-planning principles in order to get a base in local reality and identity.

Field study

The visit to Chişinău was a crucial part of the inventory work. The field study lasted for a time period of eight weeks. Two (one each) Minor Field Study scholarships from SIDA made this possible. During these eight weeks we had to make the inventories, observations and interviews.

Inventory

In Chişinău the work started with inventories of existing public spaces and green structures, beginning in the city centre and moving outwards to the suburban areas. The surrounding landscape was also documented to understand how the urban meets the rural areas. Since the aim was to look at Chisinau from a pedestrian and bicycle perspective, we discovered Chisinau by foot and public transport, because we soon realised that we would be risking our lives if we had biked (and could also not find any bikes to use).

Photo-documentation

To help us remember all the places we visited during the inventory we took photos- a lot of photos. This is something we are very grateful about, because the memory is short sometimes. In total 6273 pictures were taken during these eight weeks.

Public workshop: Improve Chişinău!

A workshop was arranged with the intention of getting the inhabitants' point of view about their public space. People were invited through social media. In the invitation they could find information about the master thesis project and that they were welcome to give their opinion about public places in the city at the central park. The information was written in Romanian, Russian and English to be able to reach as many as possible. They were told to think of places they like, places they do not like, and places with opportunities. They were then asked to write why they thought about these places on post-it notes and put them on a city map. They were also asked to write why they do or do not like these places.

Studies of Maps and plans

Many maps were studied during this project, both historical and contemporary (Larsson, B & Skoog, G. 2009; E-Urbanism 2012; Google Maps 2012). This helped to get a greater understanding of the city before the field study, but also was an significant tool during the inventories. A number of contemporary maps were used for this purpose, for example, the maps of the public transportation system were crucial when trying to get around efficiently (Eremia, A. 2001; IGENOCAD 2011).

Observations

Observations were carried out throughout the whole visit in Chişinău. The extensive inventory work resulted in many hours spent in the public space of Chişinău, which was to a great help in the understanding of the Moldovans everyday life and how it is to live in Chişinău.

Producing Plans and visualisations

To visualise the information gathered during the inventories, the analysis and the result, it is processed and presented in plans and visualisations made by the authors in Adobe Illustrator and Photoshop.

Analysis

Material gathered from inventories were analysed with three methods:

SWOT –analysis, which includes the listing of strengths, weaknesses, opportunities and threats. These are then presented in table-form (Boverket 2006 p.44).

Lynch- analysis, which is a method to understand the image of the city. The original method includes the identification of paths, edges, districts, nodes and landmarks. The method is a bit modified. For example, instead of edges we use the term barriers. Lynch has a wider definition of edges, which includes barriers, than needed in this case (Lynch, K. 1960 pp. 46, 48). We

therefore chose to only look at barriers, which are defined as something that blocks the way.

Park characters. Patrik Grahn is a professor within Landscape Architecture and has written his doctoral thesis about the importance of parks and their characters. In his studies Grahn found eight characters common in parks which can be used in planning and design of green spaces. The eight characters are: the wild, the species-rich, the peaceful, the forest, the festive, the decorative, the play friendly, and the sport character (1991, p. 1).

The different characters of green spaces in Chişinău today are shown by using Grahns method for analysis. This is a way to visualise which characters are present and to envision if there are any missing that need to be added for improved green space quality.

Interviews

Because most of the literature found about Moldova was a bit out of date, it was hard to get information describing the present situation in Chişinău. Therefore narrative semi structured interviews were used as a complement to the literature studies. During the field study ten interviews with experts within the field of city planning and green space in Chişinău took place. All of the interviews were made in person and recorded in order to portray the words as correctly as possible. A few questions were prepared beforehand and adapted as much as possible to the person's knowledge and background, see questionnaire below. Depending on the answers supplementary questions were asked. During some of the interviews we had to use an interpreter. One example of an expert interviewed is the deputy head of park management, as well as people at the City planning office.

Pavel Mîndrilă is Deputy Technical Director of the Water Management projecting Institute of the Republic of Moldova, Acvaproiect. Together with his colleagues he has developed a plan for the reconstruction and cleaning of the River Bîc. The interview concerned their plan of reconstruction and the quality of Bîc River.

Ina Coseru is head of National Environmental Centre (NEC) of the Republic of Moldova. NEC is a non-governmental organization with an ongoing project called Bîc River Basin, regarding the water quality of River Bîc. Two interviews were held with her concerning the main threats to Bîc River Basin, NEC's relation with political authorities, and future strategies for the improvement of River Bîc.

Vladimir Garaba is President of the Chişinău Branch of the non-governmental organization Environmental Movement of Moldova (MEM). The interview concerned the main threats to the ecology of Chişinău and the work of MEM regarding these.

Vladimir Us works at Moldova Young Artists Association, Oberliht, a non-governmental, voluntary, non-profit and politically non-affiliated society. Through different types of projects and events they are working for the public benefit (Asociaţia Oberliht).

Alina Ostopov took her architecture degree in 2007 at the Technical University of Moldova (UTM). For two years since then she has been teaching a mandatory course in landscape architecture taken by architecture students in the fifth year out of six. She gave us information regarding the state of green spaces and the approach to Landscape Architecture in Chişinău.

Alexandru Covalendru is head of the building company, Constructiv. He told us about the building procedure and the role of Landscape Architects in Moldova.

Galina Lehau is Deputy Head of Spaţii Verzi, a municipal enterprise maintaining the green areas of Chişinău. Two interviews with her concerned the maintenance of green space and strategies for the future maintenance.

Questionnaire for interviews

- What is the aim of your organisation/department?
- How is the organisation supported economically?
- Do you cooperate with any organisations/departments?
- What is your relation to the local authorities (City Hall)?
- How is your organisation/department involved in the development of Chişinău?
- How would you prioritise the main tasks for the future development of Chişinău?
- What is your opinion about the social and ecological value of the blue-green structure of Chişinău on a local and regional level?
- How do you work to preserve/improve these values?
- Is there a civil/political awareness in Chişinău regarding these values?
- How do you think peoples perception of the blue-green structure in Chisinau will change in the future?
- Do you follow any national/international regulations or legislations?
- Where is Chisinau in 20 years considering what we have discussed today?

Conversations with residents in Chişinău gave information about their everyday life and how they use public space. The following people helped us by showing us their city and telling us about their background and their opinions giving us a wider perspective of Chişinău.

Anna Ivanova, Interpreter, studies cultural anthropology at University High Antropological School and employee at Chisinau Hostel

Antonina Rujin, Employee at Chisinau Hostel
Cristina Jandîc, Studies economy at the Academy of economic studies of Moldova.

Daniel Vodă, Studies international relations at State University of Moldova and former member of Youth Council in Moldova.

Helena Butacova, Interpreter, office manager at TBWA\Smart

Inga Grosul, Architect at Chisinauproiect.

Sergiu Todirascu, Studied at Technical University of Moldova.

Tanya Todika, Manager at Chisinau Hostel

Valeriu Istrati, Volunteer at Hai, Moldova! Working as coordinator and with IT & Logistics.

Back in Sweden we had a meeting with:

Martyn Futter works as a research assistant at the Department of Aquatic Sciences and Assessment at the Swedish University of Agricultural Science. One interview was held with him to discuss Acvaproiects proposal for River Bîc.

DEFINITIONS AND ABBRIVATIONS

These are the definitions of terms used in this thesis.

Aesthetic values – According to Ian Thompson, the aesthetic value within landscape architecture means creating a visual experience through a connection or contrast to the surrounding environment, by the use of materials, shapes and spatiality. A major part of landscape architecture concerns improving a place visually and is done by considerations regarding spatial, visual, structural and historical qualities, the character of the place, and from this contribute to something suitable for the place (Thompson, I. 1999, p. 89).
Blue-green infrastructure - "Blue or green infrastructure comprises those natural features on the land (e.g. forests, wildlife habitat, wetlands, etc.) or in the water (e.g. anadromous fish use areas, oyster reefs, underwater grass beds, etc.) that are critical to maintaining ecosystem and human health and survival" (Virginia DEQ 2012).

City Park – The city park is a more representative park with special qualities, like flowerbeds, serving, fairground etc. It is usually characterized by a high level of care and maintenance (Hermansson, Å. 2002, p. 24).

District Park – Every district needs a district park. The district park attracts activities and people and should provide space for different activities, for example winter play, daycare excursions, flowerbeds, serene places and open space for play, gatherings and pick-nick. It needs to be at least 1 ha big for different activities to be able to take place simultaneously and at the same time provide opportunities for serene places away from traffic. Running costs should be higher and every park needs its own management plan based on the character and quality of each district park (Hermansson, Å. 2002, p. 24).

Ecological values – According to Ian Thompson examples of ecological values are an energy-effective constructions, the use of local and sustainable materials, the apprehension of day-water, or the creation of habitats. It is however common for the ecological value to be overseen in urban environments, even though it is very important for a sustainable urban development (Thompson, I. 1999, p. 175).

Ecosystem services – Are natural processes, such as water purification, generation and maintenance of soils, pollination of crops, climate regulation, and flood control, which are important to human society because of our reliance on these recourses and services to sustain human life (Cain, Bowman & Hacker 2008 pp. 481, 499, 572).

Eco-tourism – This kind of tourism has the purpose to preserve the environment, and main attractions concerns bio-diversity and unpolluted areas. Eco-trips should be a learning experience and support the local atmosphere and economy. This kind of tourism is taken very seriously in Europe (European Travel Commission).

Forest-park – is according to Moldovan legislation a result of the aim to create places for recreation and leisure in existing forest massifs for use in the urban area. The area offers shelter for visitors, camping sites, sports fields, water facilities etcetera.

Green links – In this thesis we define green links as green connections between green spaces constituted by for example street trees and vegetative ground-cover. A green link has an ecological value by being and connecting habitats and as a corridor where species of plants and animals can spread. It also has a social value being and connecting meeting places and increasing accessibility throughout the urban fabric. We also believe the green link can have a recreational value by constituting green space.

Green space across the traffic arteries – According to Moldovan legislation this is alignments of trees and vegetation strips of different width, depending on character and important artery, to improve urban ambience and to create aesthetics passages (Parliament of the Republic of Moldova 1999). Further on we call these spaces Green thoroughfares.

Green spaces – According to Moldovan legislation the definition of green space are: harmonized architectural complexes consisting of the built landscape of urban and rural areas. Some examples are landscapes, areas of watercourses and water bodies and road constructions. The aesthetic, biological and environmental values are important, including the combination of vegetation (woody tree, shrub, floricultural and herbaceous) and animals (Parliament of the Republic of Moldova 1999).

Green structure - Green areas in cities and conurbations are connected, and constitute a wholeness – a green structure – independent of who owns or administers the land. Everything from the arranged park or garden to the wild nature is included in what within a planning context is called green structure (Boverket 2011).

Micro-raion – A Soviet planning concept from the period in the 1960s-80s. A micro-raion or micro-district is a residential area with high-rise buildings, containing a group of living complexes surrounding a yard. Within direct connection are facilities for everyday life as well as schools located (Borén, T. 2005 pp.92-93).

Mixed-use - Mixed-use development means that different types of functions, such as housing, offices, and commercial areas, are mixed together within an area, making it more diverse. The variety increases if different stakeholders, developers and designers are involved in the development of an area. Mixed-use areas are more vital and attractive, and lower rates of car ownership and usage due to the proximity of different functions (Department for Communities and Local Government 2006, p. 6).

Neighbourhood Park – A neighbourhood park needs to be about 1-5 ha for several activities to be able to take place at the same time without disturbing each other. It is foremost for people living in the area and should be situated within 300 meters from the residence. Neighbourhood parks give a neighbourhood identity and have a social function. It is both a green lung and a meeting place, where one should feel safe. The level of management should be high but does not need to be as extensive as the management of district parks (Hermansson, Å. 2002, p. 25).

Park – is according to Moldovan legislation a green space with an area over 20 hectares, which offers a rich and varied vegetation structure. It gives opportunities for recreation and activities in the field of active rest as sports, outdoor games and passive or nature activities as for example cultural events (Parliament of the Republic of Moldova 1999).

Pocket park – A pocket park is a small park, less than 1 ha, situated close to the residence. They are important as small green areas and contribute to a varied and vivid city life. They improve the level of orientation and act as a supplement to inner yards, but do not replace the corner parks as they do not provide enough space for finding serene places, running or playing ball (Hermansson, Å. 2002, p. 28).

Public garden – According to Moldova legislation a public garden covers an area of about 3-20 hectares, offering rest and recreation of the inhabitants living in surrounding areas on a daily basis. Included are areas planted with trees and decorative shrubs, lawn and flowers (Parliament of the Republic of Moldova 1999).

Social values – Ian Thompson means that social values are secured by considering human needs in a design. Well-designed places improves people lives, and well-designed places are made through inclusion of civic society in the planning and design process, through a functional design adjusted to the planned activity, and through a connection to the history of the place. A construction need to be formulated as a social process, not only as an aesthetic object (Thompson, I. 1999, p. 103).

Sustainable development - "A development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (NGO committee on Education 1987).

Urban nature – The urban nature supplies a different use than the parks. It can be used for activities which need vast space and where the experience of nature is a part of recreation, like excursions, skiing, running and horse riding. Urban nature has a pedagogical value since it shows nature in a more original state (Hermansson, Å. 2002, p. 30). Except for the recreational value, two other basic functions are included in urban nature; primary production which concerns urban agriculture, silviculture, animal breeding and fisheries, and other ecosystem services as moisturizing, the air and the soil, leveling or regulating the temperature, scenting the city air through soil organisms, regulating the water flows, retention and release (Berg, G. P.).

Zhiloi-raion – Means residential district. A district with several mikro-raiony constitutes a zhiloi-raion, housing, depending on the size of the city, 25 000 to 80 000 inhabitants. At the centre further specialised facilities (than in the mikro-raion) are located. The Soviet planning ideal was to provide everything you needed for everyday life within a short walking distance from one's home, including green areas. Only in exceptional cases journeys to the city centre should be needed (Borén, T. 2005 pp.92-93).

WHAT IS A GREEN STRUCTURE PLAN?

This chapter presents the case study of Borlänge Green Structure Plan and Parkprogram för Uppsala, to find the answer of what a green structure plan is and what it contains. We then give our view of the values of green structure and how it can be used to deal with climate change. Patrik Grahns park characters, which are used for the analysis of the parks in Chişinău, are presented.

Figure 1: Cover of Borlänge Green Structure Plan 2002. Source: Gunnars, L-E. 2002.

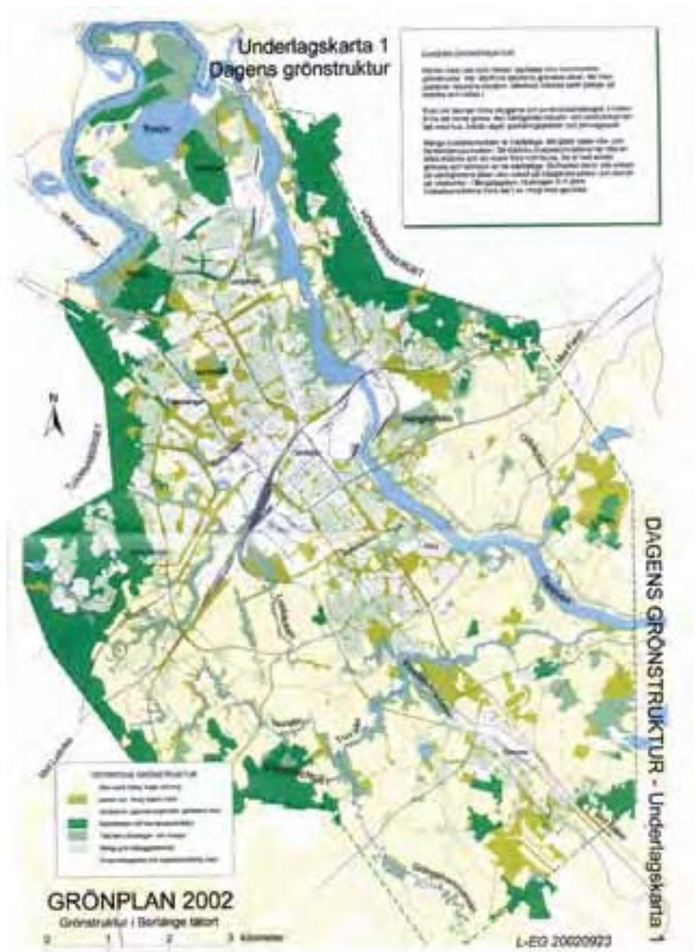


Figure 2: Inventory of existing green structure in Borlänge.Source: Gunnars, L-E. 2002.

Figure 3: Analysis of the access of neighbourhood parks and potential new ones. Source: Gunnars, L-E. 2002.

Figure 4: Proposal for a new green structure plan including different types of green space. Source: Gunnars, L-E. 2002.

Figure 5: Detailed proposal for the green structure within Skräddarbacken, one of the city districts. Source: Gunnars, L-E. 2002.

CASE STUDY OF BORLÄNGE GREEN STRUCTURE PLAN AND PARKPROGRAM FÖR UPPSALA

To understand what a green structure plan is and how it can be implemented in Chişinău, we conducted an inductive case study of the disposition, design, and theory of the Borlänge Green Structure Plan, made by Borlänge Energi Stadsmiljö in 2002 (Gunnars, L-E.). Borlänge Green Structure Plan is used as an example because of the close relation between Chişinău and Borlänge municipalities, and because the plan is extensive and covers both large and more detailed planning scales.

Borlänge Green Structure Plan

The Borlänge Green Structure Plan covers the urban part of Borlänge and consists of a policy section with text and goals for the green structure, a section with comprehensive plans, and two sections with more detailed plans of all districts in Borlänge. The policy section describes green structure, what the threats are, and how valuable parts can be protected. The first chapter has more common goals and describes what green structure is, what ecology in a city can be, how identity is linked to green structure, and why people need access to green space. The second chapter goes more into detail about laws and regulations concerning the green structure and presents comprehensive goals for the planning of green structure in Borlänge. The third chapter gives information and goals for different kinds of land use in Borlänge, including forests, water areas, parks and green spaces, green links and sport areas. The policy part ends with goals for the continuous work.

The section on comprehensive plans consists of inventory plans, analysis, proposals and procedures. Inventory plans show the green structure in Borlänge, the different biotopes, biological core areas with green corridors, and the use of the green space. Analytical plans show the access to existing green space and places for new potential districts- and corner parks. Plans with proposals for the green structure show where to protect, develop and make the green structure more accessible. The second plan shows where different kinds of green space, for example district and corner parks, should be located. In the end the systematic measures are shown based on the proposal for the green structure.

The more detailed part of the Borlänge Green Structure plan has 24 different plans for the districts of Borlänge, and covers all parts of the comprehensive plans. Shown together with the district plans is information about the district and its relation to the local plan, master plan or comprehensive plan. Further information is given about the character, problems, potential, goals, and ideas for the green areas in each district.

This thesis firstly concerns the comprehensive plans and does not go into detail for each district in Chişinău due to the time limit. Instead, we chose one area for a more detailed inventory, analysis and proposal which is presented in a more detailed plan.

Uppsala Parkprogram

As a base for terminology and definitions of categories for the division of different kinds of parks we used Parkprogram för Uppsala (Hermansson, Å. 2002), which is an action program for how to develop the green areas of Uppsala. The plan includes two documents, the first being a policy document and the other a description of the districts in Uppsala with strategies for future development. For this thesis only the first policy document was studied, with the focus in different park categories.

To structure the green areas in Uppsala they are divided into different categories depending on which functions they contain and the level of maintenance (Hermansson, Å. 2002, p. 7). The different categories are: city parks, district parks, neighbourhood parks, pocket parks, district squares, and urban nature. The focus for this case study was to get an understanding of these park categories. Therefore the different categories are presented more closely below, except for the district square, due to our limitations.

City Park: A city park is usually characterized by a high level of care and maintenance as a"green jewel" of the city with special qualities as flowerbeds, cafes, room for festive activities, etc. (Hermansson, Å. 2002, p. 24).

District Park: Every district needs its park, and this well-maintained but not as the city parks are. This kind of park attracts people and activities, and as an outdoor room it fulfils the needs of different kinds of people. The district park should contain an extra good playground with something to do all year around, have room for kindergarten excursions, flowerbeds and benches for elderly people to sit on, as well as an open grass area for ball play, games, and picnics. To be able to contain all these activities it needs to be larger than 1 hectare, but preferably much bigger (Hermansson, Å. 2002, p.24).

Neighbourhood Park: This park works in the same way as the district park but less maintenance is needed compared to the district park and it is primarily meant for people living nearby. As a rule it should be 1-5 hectares and not be further than 300 meters from home. The neighbourhood park gives an identity to the area and fills a social function as a green living room (Hermansson, Å. 2002, p.26).

Pocket Park: The pocket park is a small park, usually less than 1 hectares big and is situated close to home. Pocket parks are often placed where people frequently pass by and help with the orientation of the area. The character and function of this type of park varies but can, for example, be "a pearl", a respite in the dense urban network or a playground (Hermansson, Å. 2002, p.28).

Urban Nature: The urban nature is a park with the character of nature. They do not need to be totally natural but the appearance must be. These areas are used in a different way than the other parks. They are ideal for activities that require much space, for example picking mushrooms and berries, jogging, and riding. It also fills a pedagogic purpose for children to learn about nature and building huts and to experience small adventures on their own (Hermansson, Å. 2002, p.30). Except for recreational purposes two other basic functions are included in the urban nature: primary production which concerns urban agriculture, silviculture, animal breeding and fisheries, and other ecosystem services as moisturizing, the air and the soil, leveling or regulating the temperature, scenting the city air through soil organisms, regulating the water flows, retention and release (Berg, G. P.).

In the result section of this thesis these categories are matched with the already existing division of green space used by the green space management, Spații Verzi, in Chișinău to give a tool for increased diversity in the management of green space.

GREEN STRUCTURE PROVIDES MANY VALUES

One of the greatest challenges of today's society is to achieve sustainable urban development. The values of environment, nature and culture need to go hand in hand with values from a social and economic perspective. The preconditions to create enduring sustainable development of the urban environment are in a great extent determined by how the built environment is preserved and how it is developed (Boverket 1999, p.12).

Physical planning is a tool which makes it possible to govern how green areas are to be developed in the future and be protected if needed. There are different laws through which it is possible to regulate the green areas. What legal framework regulates the green areas in Chișinău will be presented later on. The green areas are an important element in the city and a large part of the general plan. A green structure plan or program works as basis for decisions in the general plan. The plan provides the municipality with better knowledge and a better overall picture of the value of the green areas and their importance. Large amounts of green area do not automatically lead to a better built environment. But if it is integrated with the rest of the infrastructures within the city it can contribute to an attractive, sustainable and prosperous city which leads to increased welfare (Boverket 2009, p.16).

Two methods for city planning

There are two main methods used for the development of urban areas today. One where the intent is to build a dense city and create urban qualities with a wide range of services at a short distance. A city with short distances requires less transportation and saves the surrounding agricultural and recreational landscape. The other intent implies a sparse city where the built elements are ruptured which makes room for local cycles close to where people live. This leads to short transport of locally produced food and also the ability to take care of residues locally. No matter which one you chose it will affect the appearance of the green areas in the city. Today's development usually leads to densification within the borders of the city. Every so often in this process it is parks, green areas and other non-built areas that are subject for exploitation, to make place for new buildings and streets. This densification can do damage to the cultural, ecological and social values of these areas. As a consequence of this densification the green areas get more fragmented. Smaller and more scattered pieces of green areas have less possibility to maintain the values earlier mentioned. Larger and more coherent green structure have, in most cases, the possibility to contain more values than small and scattered ones (Boverket 1999, pp.12-13).

The value of green structure

The green areas of a city create a net of greenery, a skeleton which connects different areas with each other. It stretches over both private and public places without regard to property-ownership. If you add the water recourses like lakes and rivers, you get a blue-green structure, which has many functions for the city and the people living there. Most important are the preservation of biodiversity, which is crucial for maintenance of the recourses and ecosystem services that the society depends on. These services can for example be water purification, pollination of crops, climate regulation and flood control (Cain, Bowman & Hacker 2008 pp. 481, 499).

These areas also create an opportunity for recreation, relaxation, experiences, and different activities. The green areas can also create an arena for concerts, theatre, exhibitions or display cultural events. Since parks and nature are one of the few non-commercial rooms in the city, they work as informal meeting places and democratic rooms where everyone has access and possibility to meet. In some green areas there is even room for local cultivation. All these things are important for people's health and wellbeing. Parks, gardens, squares and avenues have great amenity value for the city as a part of the architectonic expression and the cultural heritage (Boverket 1999, p.13).

There are many examples of cities that have developed new bicycle and pedestrian paths with the aim of making a city for its people and not for its cars. An early example is Curitiba, Brazil, where the mayor, Jamie Lerner, introduced massive changes with a 300 km network of bicycle lane connected with public transport systems in the 70´s and 80´s. He also introduced pedestrian streets in the city centre, mixed living and working areas and an ambitious recycling program. In a lecture Jamie said:

"Every city in the world can be improved in less than three years… When we are talking of sustainability it is not enough with green buildings, new materials or new sources of energy. It is the concept and design of the city that matters most"
(TED Talks, Jamie Lerner sings of the City 2007).

Other examples are Bogotá in Colombia which had Curitiba as role model when implementing their new public transport and bicycle system and Copenhagen where Jan Gehl influenced the public space to fit people and not cars by constructing extensive bicycle lanes and pedestrian streets. The common denominator is that these cities have improved the quality of life for citizens and in the same way moved closer to sustainability.

Green structure acts as the lungs of the city, by means of their contribution to a better climate, a fresher air environment and the possibility to make ecological and sustainable storm water solutions. This is essential for good ecology in the city and to support a rich flora and fauna. If the micro-infrastructure for pedestrians and bicyclists is combined with the green structure they both add value to each other (Boverket 1999, p.13).vvv

HOW TO DEAL WITH CLIMATE CHANGE

In cities there is a high proportion of buildings and other impervious surfaces which store thermal energy. This generates a higher temperature within the city than in the countryside, creating what is called a microclimate. The microclimate sometimes leads to a phenomenon called the urban heat island effect. In combination with high levels of air pollutants the heat increases cloudiness and fog which in turn gives higher humidity and increased precipitation compared to surrounding areas. The effect increases the air pollution and greenhouse gas emissions, heat-related illnesses and mortality and decreases water quality. It also raises the energy demand and costs for air conditioning (United States Environmental Protection Agency (EPA) 2012). In combination with the recent years of heat waves in Europe (2003 and 2006) when many thousand people died during the summer months, it is even more urgent to deal with the problem of urban heat islands. It is necessary to take action to reduce this problem.

Greenery evens out temperature differences

Green areas reduce this effect because they have a lower temperature than the built areas. This difference in temperature between green and built areas generates different air pressure, which generates wind. In this case light breezes blow from the green area into its surroundings. This phenomenon is especially valuable during inversion. Normally the air temperature is highest closest to the surface of the earth and air can freely ascend into the atmosphere. Inversion occurs when the situation is inversed; the air is cooler closest to the ground and has a higher temperature higher up in the atmosphere. This generates decreased air movement which increases air pollution because emissions, instead of ascending, stay close to the ground and create what we call smog. The breezes from the green areas help clean the air by diluting the smog. Also, green areas stretching into the city from the countryside are important for the movement of air. They act as ventilation channels especially during the wintertime when winds are weak and there is ice on water surfaces (Örebro kommun 2006, p. 45).

How much does the green area affect the urban climate?

In the aim to improve energy efficiency there are some studies made of how green structure affects the microclimate. The report, Adapting Cities for Climate Change: The Role of the Green Infrastructure , shows results from simulations on how temperature, energy consumption and runoff in the city of Manchester are affected by the amount of greenery in comparison with other surface cover. High density areas are defined as an area where buildings cover 31 % and other impervious material cover 37 %. They present the result from models run with data for today's climate (1961-1990) and a calculated scenario climate for year 2080. Their model shows that an addition of 10% of green surface to today's structure will decrease the temperatures by 2˚C. If nothing changes in surface proportions to year 2080 there will be a temperature increase of 1.7 ˚C and 3.7 ˚C (low and high). If instead 10 % of the green surface is removed the temperature will increase with 7-8 ˚C. This shows how important the green areas are in the urban area (S.E. Gill, J.F. Handley, A.R. Ennos and S. Pauleit (2007) pp.115-123). With good physical planning it is possible to reduce the impact of future climate changes in the city. Another study published in 2008 by Auburn University, shows that if 17.5% of the building is covered by dense tree shade it decreases the power usage by 11.4% compared to a fully exposed building (The Center for Forest Sustainability 2011).

Even small green areas play an important role

Large as well as small green areas decrease the effect of air pollution by absorbing some pollutants and capturing particles on the surface of the leafs. This is shown in a study presented by the European Commission in 2007. According to the study trees in urban areas can decrease the particulate pollution as much as one quarter compared to if there were no green areas. This is especially effective for small particles with less than 10µm in diameter, which also are most threatening to human health in the long run (A.G. McDonald et al 2007, p. 8455).

As the particles and dust are only captured by the leaves, they are later washed down in to the earth and streams with the rain. This leads to the necessity of a good storm water system that cleans the runoff before it reaches the surrounding nature. 1 ha of mixed deciduous forest can filter approximately 15 ton of dust in a year (Örebro kommun 2006, p. 45). In urban environments with a high amount of impervious surfaces the street trees are even more important, since otherwise the dust may swirl around and constitute a health hazard for pedestrians, road users and residents. Apart from capturing particles, the tree produces oxygen, binds carbon dioxide, gives shade, and performs other ecosystem services (Boverket 2010, p. 31).

How to make people use parks?

For everyday use it is important to have an accessible green area close to your home, especially for children and elderly people. Different types of green areas fill different kinds of needs. Therefore, it is important to have a diversity of green areas to maximise the potential social value and quality. The distance from your home is an essential factor for frequent use of the green areas. According to research people are not willing to walk more than 300 meters to reach a green area. This guideline is commonly used in physical planning in municipalities in Sweden today (Boverket 2007, pp. 11, 14).

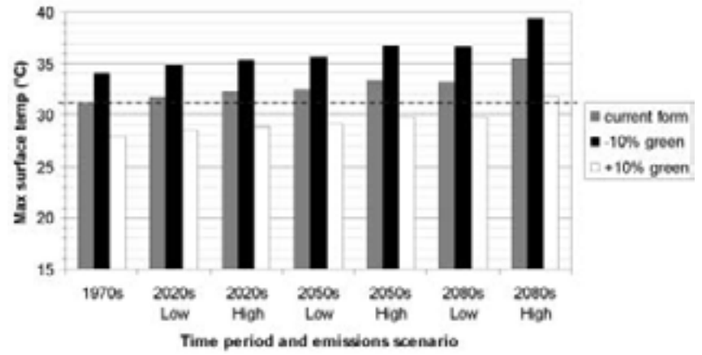


Figure 6: Maximum surface temperature for the 98th percentile summer day in town centers, with current form and when 10 per cent green cover is added or removed. Dashed line shows the temperature for the 1961–1990 current form case. Source: Source: Gill, S.E., Handley, J.F., Ennos, A.R. & Pauleit, S. 2007, p.123.

Green Structure

- take care of stormwater
- lowers the temperature both in- and outside during the summer months.
- protect from dangerous UV- light with its shadow
- contributes to social meeting places and outdoor environment for recreation and rest
- support the preservation of biodiversity in the city
- cleans the air and reduces noise

Patrik Grahn (1991, p. 1) is a professor within Landscape Architecture and has written his doctoral thesis about the importance of parks and their characters. In his studies Grahn found eight characters common in parks which can be used in planning and design of green spaces. This method is used for the analysis of the parks in Chisinau, to find what characters that might be missing. The reason for this analysis is to get information to base future development of green spaces on. The aim is to create as much diversity in the green space as possible.

Figure 7, 9, 11, 13, 15, 17, 19, 21 Source: Grahn, P. (1991) pp. 2-3. Illustrated by Agneta Persson.
Figure 8, 10, 12, 14, 16, 18, 20, 22: Photos by Johanna Hagberg.

The Wild Character

This character provide people with the need of being in a more "natural" and unpredictable environment which triggers the fantasy. A park area with a wild character is more rampant with waters and meandering paths.

Figure 7-8: The wild character according to Patrik Grahn and the equivalent in Chișinău, located in the south part of Valea Trandafirilor park.

The Festive Character

This park is intense and for socializing and pleasure. It is a cultural environment with well-maintained paths, lights and cafés. People should be able to relax and have fun together here, day as night.

Figure 9-10: The festive character according to Patrik Grahn and the equivalent in Chișinău, showing a gazebo in the Dendrariu park.

The Decorative Character

The Decorative Park is well-arranged and a meeting place, similar to a square. Cultural symbolism is important and the park is decorated with flower beds, fountains, statues, etc.

Figure 11-12: The decorative character according to Patrik Grahn and the equivalent in Chișinău, showing a gazebo in Valea Morilor park.

The Species-rich Character

In a species-rich park there is a multiplicity of flora and fauna. It offers a varied experience and it is a much appreciated character by all ages of people according to the study.

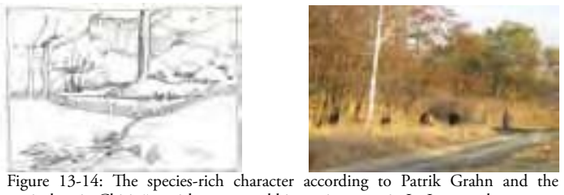


Figure 13-14: The species-rich character according to Patrik Grahn and the equivalent in Chișinău, with a man and his grazing cows in La Izvor park.

The Peaceful Character

A park with a peaceful character is a cultural environment with roots in historic landscape ideal where people can enjoy the stillness and history of the place. The park is clean, has no disturbances and the vegetation is well-maintained.

Figure 15-16: The peaceful character according to Patrik Grahn and the equivalent in Chișinău, located at the artifical lake in Dendrariu park.

The Forest Character

These parks are big and have a hilly and homogenous character. The vegetation is dense and people mostly use these areas for exercising in various ways while discovering the small nuances.

Figure 17-18: The forest character according to Patrik Grahn and the equivalent in Chișinău, which can be found in Mihai Eminescu forest-park.

The Play Friendly

Park is robust and intimate which allows play and wearing on the environment. It should be separately located with few disturbances, and have flowers, water and vegetation to explore and use.

Figure 19-20: The play friendly character according to Patrik Grahn and the equivalent in Chișinău, with a homebuilt gym in the Rișcani forest-park.

The Sport Character

This character has big and open spaces and also needs to be robust. The environment should have leeward places and a varied surrounding vegetal environment, encouraging physical activity. (Grahn 1991, pp. 2-3)

Figure 21-22: The sport character according to Patrik Grahn and the equivalent in Chișinău, the sports field located at strada Alexandru Hajdeu.


ALIMENTARA

SITE DESCRIPTION

Figure 23 (left): Location of The Republic of Moldova in Europe.
Source: Wikipedia 2009, modified by Karin Winroth.
Figure 24 (above): Location of Chișinău in the Republic of Moldova.
Illustration made by Karin Winroth modified from Biotica 2012.

THE REPUBLIC OF MOLDOVA
Chișinău

This chapter offers a cite description and a short summary of the history of Chişinău.

The Republic of Moldova is situated in the central part of Europe in the north-eastern Balkans, between Ukraine and Romania, close to the Black sea but it is landlocked. The country covers an area of 33 800 m2, an area similar to Belgium and Luxembourg together and covers 7.5% of the area of Sweden. It has 3 562 062 inhabitants which gives a population density of 124 inhabitants/km2, to compare with Sweden who have a population density of 23 inhabitants/km2.The demographic growth is decreasing with -0.1% (Landguiden 2011).

The majority of the people in Moldova live in villages and only 1/3 of the Moldova population lives in towns. Moldova is a rural country but few people live outside the villages in the open countryside. Most towns are being taken care of by its inhabitants and it is very common to have a small garden with colorful fences and houses. (Larsson, Skoog, 2009, p.12).

Chisinau is the largest city of Moldova and has been the capital since 1940. It is located in the center of the country. The Chisinau municipality was founded in 1436 and is the political, administrative, scientific and cultural center of the Republic of Moldova. The city has a population of about 586 000 people (Landguiden 2011) which is about 17% of the country's population.

Moldova is a multi-ethnic country where people primarily speak Romanian, but parts of the population also speak Russian and Turkish. In the autonomous republic of Gagauzia, people are Turkish-speaking and Transnistria is mostly inhabited by Ukrainians and Russian-speakers. In Chișinău 66% of the population is Romanian/Moldovan, 13% is Ukrainian and 13% is Russian (Larsson, B. & Skoog, G. 2009, p. 11).

SUMMARY OF THE HISTORY OF CHIȘINĂU

Moldova has a rich history with a large diversity in culture and historic trends (Republic of Moldova official website 2011), a history closely linked to the development of the capital city, Chișinău. This chapter shows the primary history of Moldova and the subsequent effect on Chișinău.

The former Moldovan Principality was created, composed of the area between the Carpathians, the Black Sea and the Dnister and Danube rivers, together with the province Moldova. The Principality of Moldova was a centre of commerce and cultural communication. In 1436 Chișinău was only a small village, mentioned as Chesenau, which means spring in old Romanian (Larsson, B. & Skoog, G. 2009, pp. 8, 21).

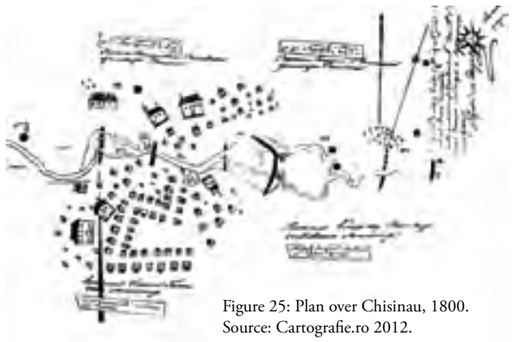


Figure 25: Plan over Chisinau, 1800. Source: Cartografie.ro 2012.

The entire Bessarabia was annexed by the Russian Empire. The Russian Empire changed the city structure in Chișinău, which had become the administrative, economic and political centre by this time. The old, radial street pattern structure was changed to grid-net patterns of mostly 200x200 m or 100x100 m. Trees were planted along streets and parks, and squares and monumental buildings were constructed. The irregular street pattern in the old city is still today being threatened by big, new boulevards cutting through it. From the medieval Albișoara well at the Bîc river people were provided with drinking water. Chișinău was to a great extent characterised by Russian planning principles of, 18th to 19th century, and grew rapidly during the Russian Empire. Chișinău had 7 000 inhabitants growing to 58 000 inhabitants, by 1850 (the 5th biggest city in the Russian Empire) and was spread on two hills (Larsson, B. & Skoog, G. 2009, pp.9, 11, 23-25).

Figure 27. Chișinău 1817. Source: fundulculturii.wordpress.com

In the 16th century the Turks conquered the entire area and controlled it for about 200 years (Larsson, B. & Skoog, G. 2009, p.9).

Romania, in co-operation with Nazi-Germany, regained the control of these areas. In 1941 the central parts of Chișinău suffered from large-scale destruction from the receding Red Army (Larsson, B. & Skoog, G. 2009, pp.9-10).

1457 — 1504 — 1666 — 18th century — 1918-1940 — 1940

1359 — 16th century — 1812 — 1941

The reign period of Ștefan cel Mare, 1457-1504, is recognized as the peak time of the Principality of Moldova during which many churches, monasteries and fortresses were built (Larsson, B. & Skoog, G. 2009, p.9).

Chișinău was mentioned as a borough and its inhabitants as townspeople (Larsson,B. & Skoog, G. 2009, p. 22).

The Turks were forced back by the Russian and the Habsburg Empires. The Russian Empire took over the area between the Dnister and Prut rivers, called Bessarabia (Larsson, B. & Skoog, G. 2009, p.9). In this period Chișinău was burned down twice by the Turks during battles between the Turks and the Russians and the Turks and the Poles. By that time about 800 people, mostly Romanians, Armenians, Jews and Greek colonialists, lived there making a living on agriculture, cattle breeding, handcrafts, fishing and hunting. (Larsson, B. & Skoog, G. 2009, pp.23-24).

Figure 26: The map shows the territory annexed by the Russian Empire in 1812. Source: Alexandrescu, I. 1994, p.17.

The Soviet Union annexed Bessarabia and Bucovina in 1940 as a consequence of the Molotov-Ribbentrop treaty. This marked the end of the union with Romania (Larsson, B. & Skoog, G. 2009, pp.9-10).

During the union with Romania in 1918-1940 Chișinău developed in a more traditional way, where different ethnic groups all left their mark on the city's development. Industries arose and the production of footwear, knitwear, and furs, while different kinds of food became avaliable as agrarian reforms were made. Chișinău was the second largest city after Bucharest in Romania in the 1930s, with about 117 000 inhabitants. By this time the city consisted of the old lower city with typically Moldovan-styled houses and Jewish ghettos, the new upper city with the English parks and the Cathedral, and its surrounding village-like suburbs (Larsson, B. & Skoog, G. 2009, pp.9, 28-29).

Figure 28: Chișinău 1932. Source: Larsson, B. & Skoog, G. 2009, p. 31.

The Soviet Union once again drove their forces to Bessarabia in 1944 which resulted in 45 years of control over the area. Moldovan food production was very important for the Soviet Union, which featured rapid economic growth and industrialization in Moldova. During the occupation the public life in Bessarabia went through a process of Sovietisation. By introducing the Cyrillic alphabet and deporting or killing Romanian and Moldovan intellectuals the Soviet Union intensified its unification with Moldova. The Romanian language, spoken by most Moldovans, was named Moldovan to separate the national and cultural identity of the Soviet Socialist Republic of Moldova from that of Romania. Many citizens of Chișinău, mostly intellectuals, fled during this time to Romania. During the Soviet period the central park with the Romanian Literature's Classic Alley was opened to the public. Also, new parks were built as Chisinau grew. (Larsson, B. & Skoog, G. 2009, pp. 10, 32-34)

In the 1970´s new blocks of 9-12 storey buildings, called mikro-raions, and broad boulevards were built in the suburbs surrounding Chișinău. These residential districts were called zhiloi raion, containing several mikro-raiony (Borén, T. 2005, p.92). As the city grew and motorism increased new throughways were constructed. Large parts of the old medieval city centre were destroyed in an earthquake in 1977, and were partly replaced by a new and different urban structure in late 1980's. The aim was to erase all pre-Russian cultural heritage in Chișinău in favour of the Soviet city planning ideal. A manipulated map from 1976 is an example of this phenomena. Compared to the Russian grid-net town, the old town is shown as much smaller than it actually was (Larsson, B. & Skoog, G. 2009, pp. 10-11, 34-35).

1944 1950 1960 1970s 1977 1980s 1989 1991 1992 1995 2001 2012

In the 1950s the city was reconstructed with high buildings in the city centre. In the 1960's a number of churches were destroyed due to the atheism of Soviet Union ideology. The churches remaining were isolated and surrounded mostly by 5-storey apartment buildings, which changed important spatial orientations in the city (Larsson, B. & Skoog, G. 2009, pp.10, 32-34).

Another devestating eartquace (Larsson, Skoog, 2009, p.11).

During the perestroika and glasnost years, the economy fell and a wish for democracy, historic and national values, and human rights increased criticism against communism (Larsson, B. & Skoog, G. 2009, p. 35).

The Republic of Moldova became an independent state on the 31st of august ,1991 during the fall of the Soviet Union. Since then it maintained its current borders.
After the independence, due to a failing economy and emigration, the development of Chișinău as a capital city were evident but slow. Foreign embassies and international institutions and organizations found their way to Chișinău after 1993 (Larsson, B. & Skoog, G. 2009, pp.35-36).

A short but bloody outbreak of conflict with Transnistria, who wanted to create a separate, independent republic, occurred in 1992. There have been no severe outbreaks since then, but the situation is still not resolved and the Russian Fourteenth Army is still stationed in the area (King, C. 2000, p. 178).

Gaugauzia region in south of Moldova with Orthodox Christian Turks, gains territorial autonomy (King, C. 2000, p.219).

The new qonstructions after the earthquaces often overrun the old structures and created gaps in the urban image as the buildnings were placed at a distance from the street creating an empty space in front of them.(Larsson, Skoog, 2009, p.11).

The communist party wins the parliamentary election (Utrikesdepartementet 2008).

Figure 29: This map shows Chișinău in 1976. It is clearly visible that the medieval part of the city is very small in comparison with the grid-net part. Sourse: Larsson, B. & Skoog, G. 2009, p.

Figure 30: The image shows the main boulevard Ștefan cel Mare in the century middle of 20th century with a tram. Source: moldova.org.

Current situation

From the 16th century until 1991 Moldova has for the most part been a pawn in the game between the Turks, Russians, Romanians and the Soviets. Today Moldova is a country in transition in more than one way. It is transforming from a planned economy towards a market-economy, and from an authoritarian regime towards democracy. Except for the Baltic states, Moldova is considered to be the most democratic post-Soviet country. However, the transition also concerns the national language, ethnicity and identity (Johansson 2011, p. 23, 27, 189). Moldova is a multi-ethnic country where people primarily speak Romanian, but parts of the population also speak Russian and Turkish. In the autonomous republic of Gagauzia, people are Turkish-speaking and Transnistria is mostly inhabited by Ukrainians and Russian-speakers. In Chișinău 2/3 of the population is Romanian/Moldovan, 13% is Ukrainian and 13% is Russian (Larsson, B. & Skoog, G. 2009, pp. 11). The issue of national identity is also mirrored by the struggle to elect a new president. Due to frictions between the Liberal Democratic Party and the Party of Communists, Moldova was without a president from 2009 until the 16th of March 2012, when Nicolae Timofti was elected president (Chisinau TT-AFP 2012).

Even if Moldova has some issues to overcome, it also has great prospects. In the following chapters we will illuminate some of the problems in Chișinău related to the green structure, but also the grand resources and potential of the city as one of the greenest cities in Europe today.

BIOGEOLOGICAL DESCRIPTION OF CHISINĂU

This chapter will present the environmental conditions of Moldova and Chișinău like climate, topography, the environmental problems they are struggeling with today, and red listed species existing in the area.

ENVIRONMENTAL CONDITIONS

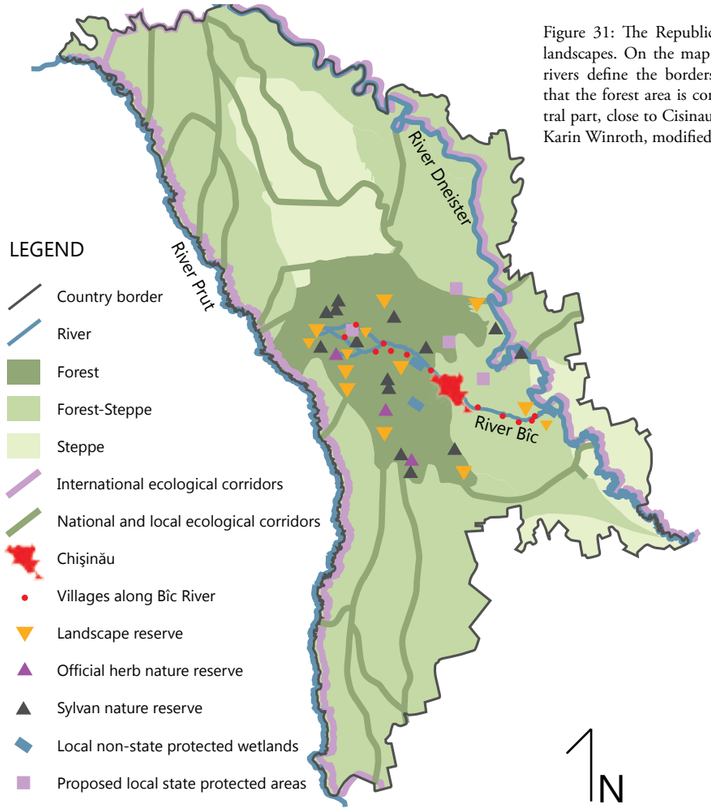


Figure 31: The Republic of Moldova and its landscapes. On the map you can see how the rivers define the borders of the country and that the forest area is concentrated to the central part, close to Cisinau. Illustration made by Karin Winroth, modified from Biotica 2002.

Climate

The Republic of Moldova has a moderate continental climate which is partly affected by the Black Sea. It has short winters and long, hot summers. For Chişinău the average daily temperature in January is -3.1°C and in July +23.1°C, although the daily highs can occasionally reach +40°C (Biroul National de Statistica, 2012). In Stockholm, Sweden, the average daily temperature in winter is -5.4 °C and in the summer +14.6°C (SMHI 2012). Humidity in Chişinău varies throughout the year, and reaches average levels of 85% in winter and 62% in summer (Postolachi & Vlădicescu 2010, p. 11).

Precipitation is light, irregular and fluctuates depending on the season and the region of the country. In Chişinău the average annual perception is 554 mm calculated between the years 2002 to 2010 (Biroul National de Statistica, 2012). 20 – 25% of the perception is in the cold period and 75 – 80% is in the warm period, but the variation between different years is very high (200-300mm). In recent years short periods of heavy rain have increased (Postolachi, L. & Vlădicescu, V. 2010, p. 10). Moldova has many annual hours of sun compared to the rest of Europe (Larsson, Skoog, 2009, p.14).

The Carpathian Mountains bar the wind blowing from the west so that the predominant wind, about 20%, comes from the northwest, 15 % straight from the north and 14 % from the southeast (see ill.). In summer there is

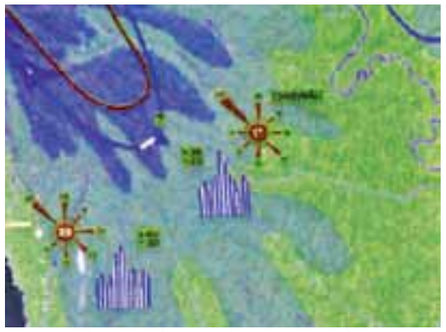


Figure 32: This image shows wind, temperature and percipitation data in the Chisinau region. Source:: Muzeul National de Etnografie, 2012-01-15.

Figure 33: This image is taken of a model that shows the terrain aorund Chişinău. The rivers have created deep valeys and Chişinău is situated on hills. Source: : Muzeul National de Etnografie, 2012-01-15.

weak and moderate wind speed up to 5 m/s, and during the cold season it can rise to levels between 6 – 10 m/s. In the city the wind is reduced, but built structures increase turbulence and wind gusts. In the central park areas the wind is slower, due to the micro climate, in comparison to the new suburban residential areas. (Postolachi & Vlădicescu 2010, p. 11).

Geology, vegetation and hydrology

The terrain of Moldova is a hilly plain cut by deeper river valleys with an average elevation of 147 meters above sea level. The country is part of the Black Sea watershed and contains a widespread network of rivers and streams, more than 3000 in total. River Prut and Dniester are the two major rivers in the country, which both at some point define the borders to Romania and Ukraine (United Nations Economic Commission for Europe (UNECE 2005, p. 7).

Most of the rivers in Moldova are canalized, and the amount of water running through them is regulated by built dykes and reservoirs for flood prevention and sediment capture. Water from the reservoirs is to be used for fishing, irrigation, and domestic and industrial needs (State Road Administration, pp. 5-6).

Moldova is part of the East European platform, with the Precambrian rock types overlain by rock types from the Cretaceous period, mainly sandstone. When it comes to natural resources, there is a small amount in Moldova and they include limestone, clay and marl deposits which are used in the local building industry (Nationalencyklopedien, 2012). The biggest asset, however, is the very fertile soil type, cherozem, which covers three-quarters of the country and makes it ideal for agriculture (UNECE 2005, p. 7).

The country contains three main geographic areas where three basic ecosystem types dominate: steppe, forest, and forest-steppe. The forest are temperate deciduous, with oak and hornbeam trees but linden, maple, beech and wild fruit trees also grow here.. Only 12% of the land has forest cover but a very small amount of these are natural formations (Food and Agricultural Organisation (FAO) 2011, and UNECE 1995, p. 73). According to [8]Coseru, Moldova was covered in forest 500 but today most of it is covered by agricultural lands. The Northern Moldovan Plain is dominated by broad, flat valleys, carved out by the many rivers. The Dniester Upland is situated on the western bank of the River Dniester. In the south there are semi-arid steppe plains, called the Podolian Plateau. In the central part the highest point in the country is found. Bălănești Hill is 429 m above sea level and a part of a massive called The Codrii Preserve, which is densely forested. Otherwise most of the country is open with wide views. The agricultural movement has to a great extent replaced natural grasslands and steppes with cultivated crops. The steppe is therefore almost extinct but in some river valleys you can find grassy salt marshes (UNECE, 1995, p. 73). Before it was almost extinct the steppe occupied the southern part of the country. The northern part has old agricultural structures with arable and pasture land. (Larsson & Skoog 2009, p. 13)

Chişinău is situated in the central part of Moldova, at the junction of two biomes: Codrii forest in the northwest and the forest-steppe in southeast. The city is built on the floodplain and slopes along River Bîc, surrounded by hills and divided by valleys (Larsson, Skoog, 2009, p. 20). The city makes up a 150 km² sloping plane towards the southeast and has a variation in elevation of 180 meters. The city has complex geological conditions and is characterized by varied land shapes. Two geological types can be identified within the city limits: a lower level with granite slabs, and an upper layer of sedimentary rocks. Above these layers there is clay, limestone, silty sand, loamy clay, sand and gravel, materials from which most buildings in the city are made. On the bank left of the river there is chernozemic soil with an average amount of humous podsoil. On higher locations there are typical ciornoziomuri leachate with a heavy mechanical composition. The River Bîc floats upon a thick layer of sand clay (Postolachi & Vlădicescu 2010, pp. 21-22, 34).

Figure 34: The image shows the terrain of the Republic of Moldova which mainly constitutes by hills. Source:: Muzeul National de Etnografie, 2012-01-15.

[8]Coseru, I., head of National Environmental Centre, meeting, 22 November 2011.

GREEN STRUCTURE, TOPOGRAPHY AND BUILT AREAS

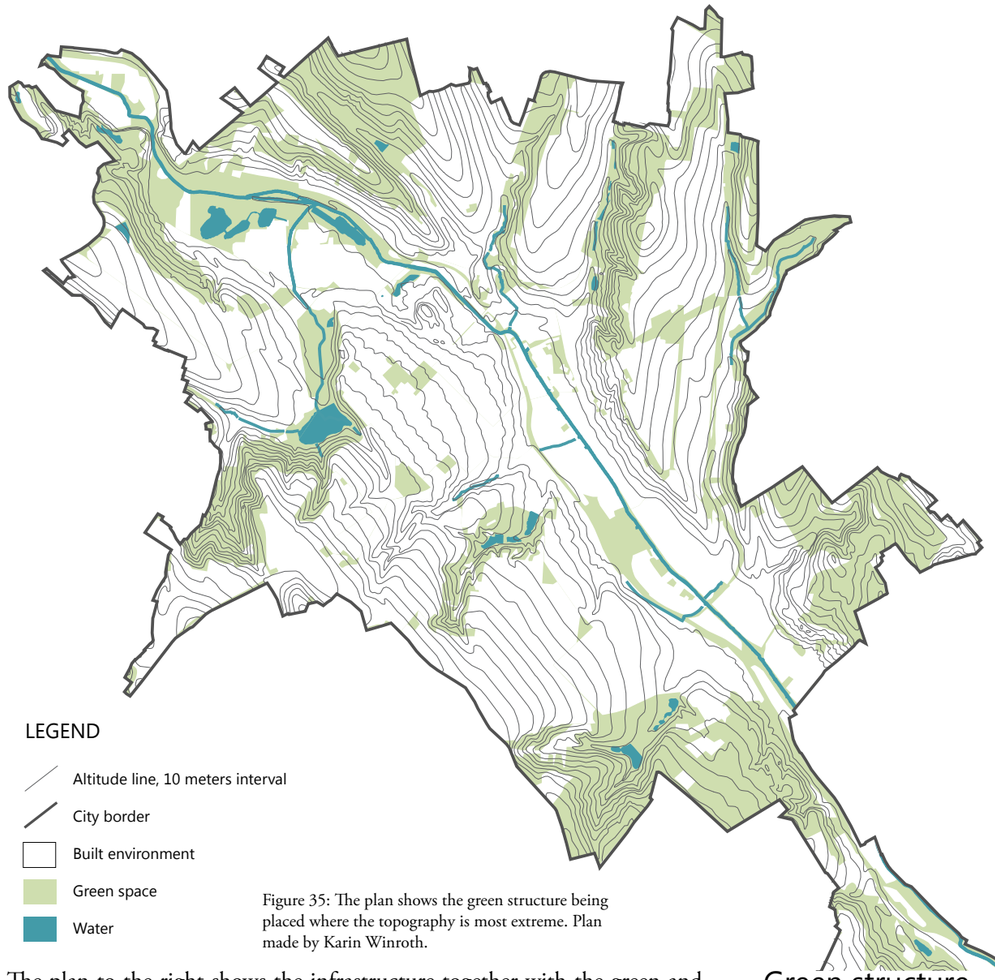


Figure 35: The plan shows the green structure being placed where the topography is most extreme. Plan made by Karin Winroth.

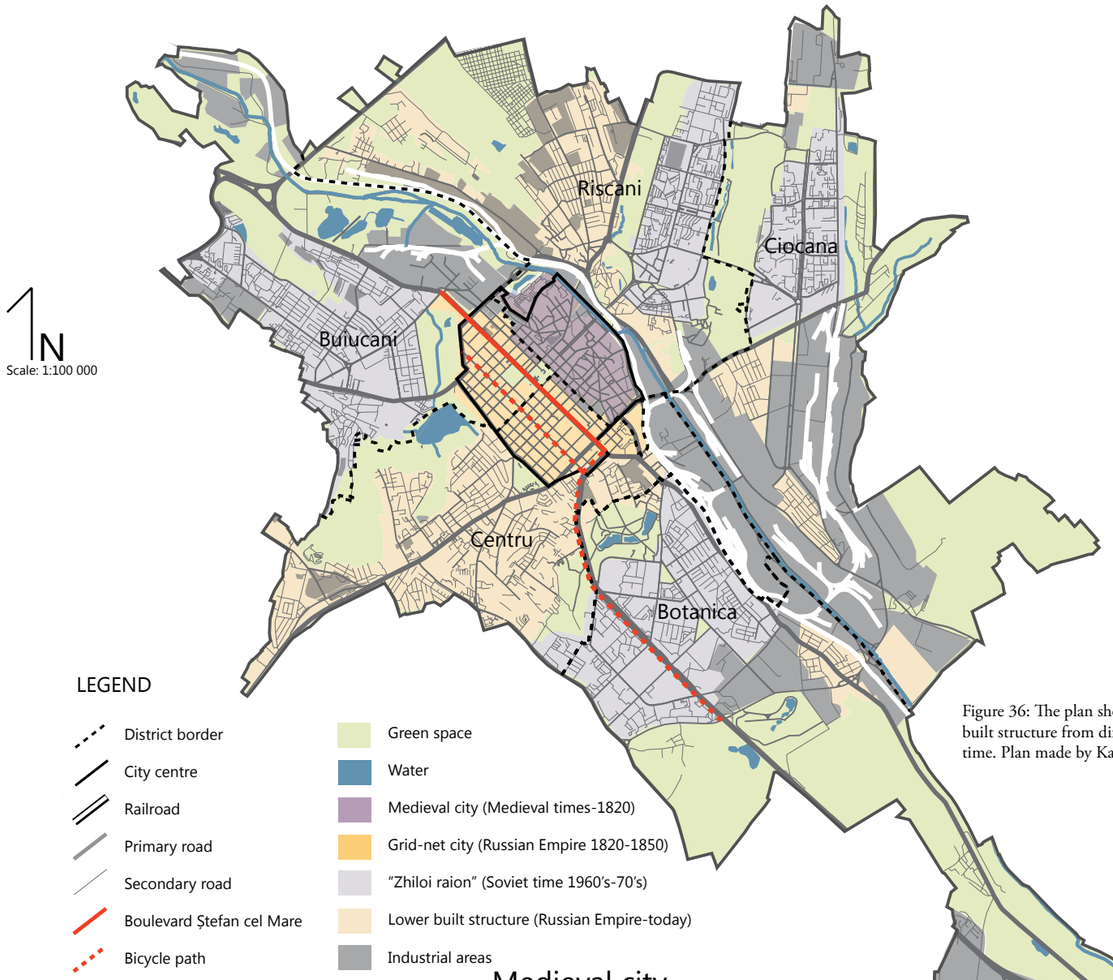


Figure 36: The plan shows the green structure and built structure from different historic periods of time. Plan made by Karin Winroth.

The plan to the right shows the infrastructure together with the green and built structure of Chişinău. The existing amount and location of green space is closely linked to the topography of the city, as you can see on the plan to the right. Wide park and forest areas have been planted along steep slopes and ravines for stabilization and to prevent landslides and erosion. This includes almost all areas not suitable for exploitation, for example, along the river basin and in lower valleys with a risk of flash floods. The vegetation cover reduces soil erosion and landslides, increase water penetration and supplies the aquifers (Postolachi, L. & Vlădicescu, V. 2010, pp. 27-28).

According to [1]Craicun the soil in Chişinău creates good conditions for green areas of high quality, and except for green inner-yards there is 2741 ha of green space. The green space is divided into five categories, parks, forest-parks, public gardens, public squares, and green space along the road arteries (Parliament of the Republic of Moldova 1999). According to [1]Craicun public squares, parks and forest-parks are accessible within 10 minutes walk from residential areas, and they are used for leisure, sports, catering and tourism. We will discuss these categories more closely in the chapter about maintenance.

[4]Nicolae Craicun, Service for Land Relations, meeting, 16 Januray 2012

Green structure

The green space is equal to 31.5 m² green space per person which can be compared to the European standard which requires 20-50 m²/person. The city is divided into five administrative districts: Botanică, Râşcani, Ciocana, Buiucani and Centru, and the amount of green space are unevenly spread between them. There is most green space in Ciocana and Râşcani, and less in Buiucani, Botanică and Centru. In total there are 180 hectares of protected natural areas in Chişinău spread between, the Botanical Garden, the Dendrarium Garden, the Garden of the National Museum of Ethnography and Natural History, and the Zoological garden. These areas are protected to keep the gene pool of flora and fauna, preserve the development of landscape architecture, and for public recreation (INCP Urbanproiect et al. 2004, p. 67).

The green and built structure in Chişinău is a result of its history and culture through different eras. Four main historical layers can be traced in the city pattern today: the pre-Russian time, the period of the Russian Empire, the Soviet time and the period after the independence in 1991.

Medieval city

The pre-Russian part (historical centre) (medieval times-1820) of the city is situated on smaller hills and river slopes, about 30 meters above the river level and 65-70 meter above sea level. Here, along River Bîc, the first settlement took place in the Middle Ages, and the area has since then developed in an organic way. In the irregular street patterns there are low dense buildings and small green areas in the pointed street corners.

Russian Empire

The Russian grid-net city (Russian-Empire 1820-1850) is located on a sloping height on one of the hills, which is 70 meters above sea level in the north-east and 120 meters above sea level in the south west. The irregular street pattern from the pre-Russian time were changed into a rectangular grid-net pattern, to improve efficiency, according to a general plan approved by Russian authorities in 1834. During this time period the large-scaled boulevard Alexandrovskaja, today Ştefan cel Mare, was built together with the two central English styled parks, Grădina Publică Ştefan cel Mare and Scuarul Catedralei. Grădina Publică Ştefan cel Mare, was not opened for the

public until the middle of the 20th century (Larsson, B. & Skoog, G. 2009, pp. 20-21, 34, 41, 45). The railway was built in the end of the 19th century along the River Bîc and it connects the industrial areas in Chişinău (Calea Ferată din Moldova).

Soviet times

The satellite suburbs, zhiloi raiony (residential districts) containing several mikro-raiony, were developed in the Soviet period, mainly in the 1960s-80s and are located on the hills and valleys around the city core. The mikro-raiony are characterized by high-rise buildings, surrounding a yard with facilities for everyday life, as for example a green space or a football ground. In between these raiony broad boulevards were built (Larsson, B. & Skoog, G. 2009, pp. 20, 34; Borén, T. 2005, p.92). In the same period vast multifunctional green spaces, called forest-parks, were constructed on the forest-covered slopes in between the new zhiloi raiony (Ignatieva, M. 2007 pp. 4-7).

The green spaces built in the Soviet times were similar in most countries under the Soviet rule and they were greatly influenced by social and political ideals. Private gardens were opened to the public and new types of green space, like, squares, cemeteries and memorial parks were dedicated to leaders and heroes to propagandise the Soviet Union. Parks of culture and rest hosted sport, cultural and political events and were built to be huge to accommodate many people at once. After 1945 and the Great Patriotic War, victory parks, memorial complexes and memorial cemeteries were built in a formal and romantic layout including statues for people to remember heroes during the war, but also for recreation (Ignatieva, M. 2007 pp. 4-7).

Today

Today new built structure is dominated by either private villas or modern high-rise buildings. Private villas with a small garden are traditionally popular among Moldovans (Larsson, B. & Skoog, G. 2009, pp. 20, 34-35). The private garden is often fenced and here people grow crops or decorative plants. There is a trend with new luxurious villas, built in gated communities. New green spaces in Chişinău are principally either private gardens or representative green space in front of administrative buildings. Similar phenomena being present in Russia today is, according to Ignatieva and Smertin (2007, p. 3) a part of the economic, cultural, and social process of globalisation in post-Soviet countries, where landscape ideals are gathered from Western countries. In comparison increased traffic and waste production in Chişinău can be linked to the globalisation and capitalisation of Moldova as well.

Public transport

The public transport is well developed and consists of maxi-taxis, buses, and trolley-buses. Many people use it and it covers most parts of the city. The maxi-taxi serve 68 routes and is the most popular public transport because it comes frequently and moves fast. However, since almost all routes intersect in the city centre, it contributes to traffic congestion and air pollution (INCP Urbanproiect et al. 2004, p. 70).

Population density

An economic recession after independence in 1991 has led to emigration from Moldova, with about 900 000 people working abroad in 2009 (Larsson, B. & Skoog, G. 2009, pp. 35, 37). According to the General Urban Plan (INCP Urbanproiect et al. 2004, pp. 23, 31), the population within the municipality of Chişinău is decreasing. Within the municipal border people are moving out of the city to build houses in the countryside. Still, Chişinău is a growing city. This is explained partly from the fact that foreign investors buy land in Chişinău as a safe investment of money. These investments increase the urban expansion and the price of land, why people are forced to move out of the city. The population density in Chişinău today per hectare is highest in the suburban districts of Botanică, Buiucani, Râşcani and Ciocana where the 9-12 story building blocks from the 1960-80's are situated. The population density is lower in the city centre where there are mostly buildings with 1-3 stories and administrational buildings.

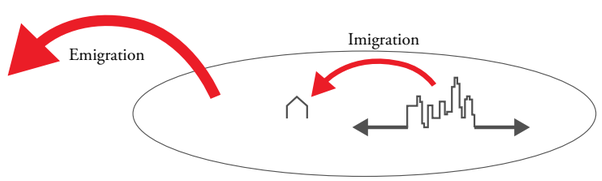


Illustration 37: Illustration of the imigration and emigration in Moldova and Chisinau. People are moving to the suburbs, a suburbanisation process, but the city is still growing. Generally people are emigrating from Moldova to work abroad. Illustration made by Karin Winroth.

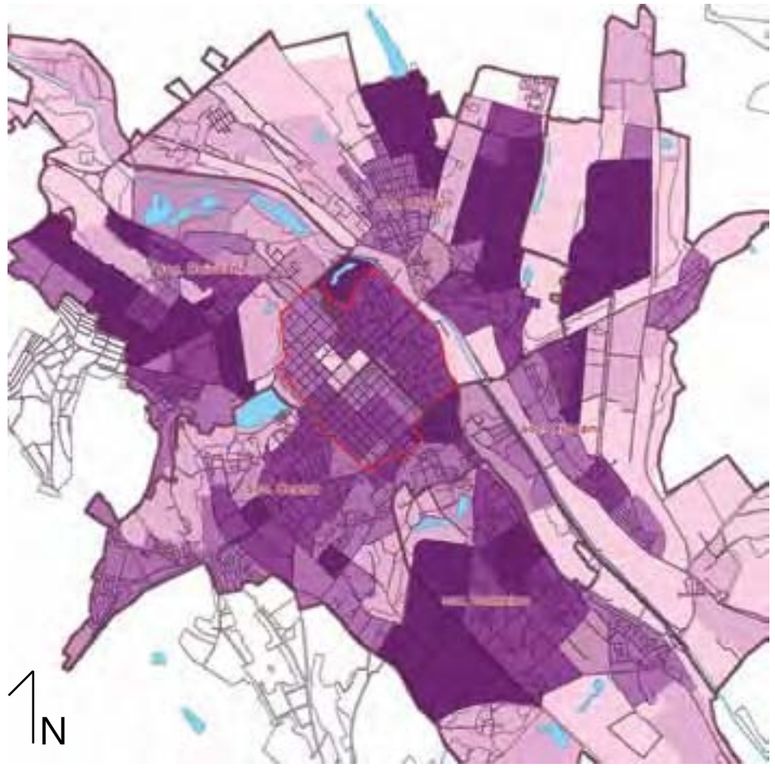
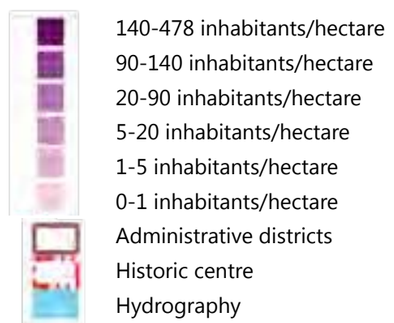


Image 38: Planning Scheme after zoning population density (framework in city). Source: General Urban Plan, Chişinău Municipality.



A growing population and extensive use of natural resources have drastically changed ecological systems in Chisinau. The consequences are pollution of air and water, destruction of the soil cover and of landscapes which leads to a reduction of the number of animal and plant species (Postolachi, L. & Vlădicescu, V. 2010, p. 19).

Threats to the Green areas

The reduction of green space over the last years is partly a result of human activities such as unregulated constructions of individual housing, social facilities, industrial enterprises, roads and parking lots. A reduction of green space affects the water penetration in a negative way, causing surface run-off, erosion, landslides and sliding aquifers. Also, some non-native species of trees and shrubs in park areas and along the river affect the biological balance and in some cases need to be replaced by native species (Postolachi, L. & Vlădicescu, V. 2010, p. 27).

Threats to built heritage

There is a risk that the values of the historic layers from the different time periods will not be noticed or respected in the future development of the city. The different layers are what make Chişinău unique, and are important for the identity of the city. Still, the historical city centre is not respected properly when new buildings or blocks are added. New buildings are often huge and placed a long distance from the streets, disturbing the street scape and the small scale of streets and buildings. The irregular street pattern in the old city is mostly turned into a rectangular street pattern and is still being threatened by big, new boulevards cutting through it according to Bo Larsson and Göran Skoog (2009, p. 11).

Atmosphere

The heat stations, CTE-1 and TPP-2, are the major pollutants releasing 60% of the emissions in Chisinau into the atmosphere, while industrial enterprises stands for 30 – 40% of these emissions. Traffic is the second largest pollutant as a consequence of a sudden increase in the number of cars in Chisinau. Because of lacking parking space in the city centre, this also causes environmental and security problems as people park their cars on the sidewalks, streets, paths and even in park areas. The third biggest pollutants are buses and transport hubs. Increased air humidity, fog, temperature inversions and low speed and direction of wind all contribute to an accumulation of the emissions in the city (Postolachi, L. & Vlădicescu, V. 2010, p. 19).

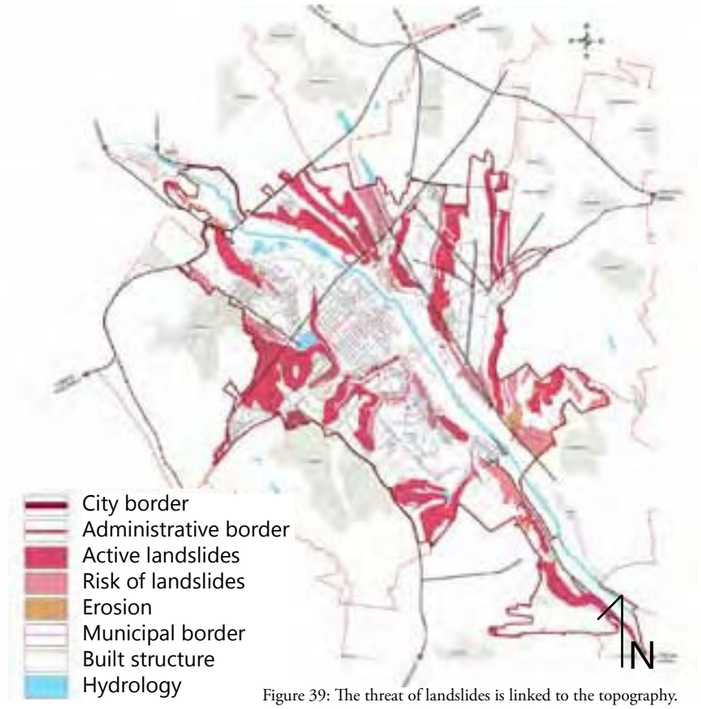


Figure 39: The threat of landslides is linked to the topography. Source: IHS Romania SR 2007, 2011-12-14.

Soil

Intensive human activities have caused a major soil degradation by reduced mineralization and thereby reduced fertility. Polluted soils also downgrade the mechanical and hydro-physical capacities of soils so it becomes unable to absorb moisture from the atmosphere. The increased privatization of land escalates the number of companies polluting soils and subsoils in the city. A control of urban construction and activity is necessary to improve the quality of soils. Technological threats to the quality of soils are: erosion, solid waste (domestic and industrial) pollution and chemical pollutions from the use of pesticides and mineral fertilizers. In green areas the microbiological processes in the soil ease the effects of pollutions (Postolachi, L. & Vlădicescu, V. 2010, pp. 25.26).

Seismicity and landslides

Earthquakes in the Vrancea region of Romania creates small local outbreaks in the territory of Chisinau. In 1977, 1986 and 1990 seismic activities caused great casualties and economic loss in important industrial sites and densely populated areas of Moldova and Romania. Slope instability and subsidence is a standing threat for objects in their distribution areas. Subsidence's act differently depending whether the slope contains sandy clay, sand, sandstones, or a rocky slope which causes rock falls. Erosion processes and humidity also affects this phenomenon.

When masses collapse the weight balance changes and the slope loses stability and the risk of landslides increases. Landslides affect, among others, houses, industries, agriculture, and infrastructure in a negative way. Landslides also have a negative impact on the hydrology of rivers and navigation systems (Postolachi, L. & Vlădicescu, V. 2010, pp. 36-38).

Waste management

In Chisinau there are 13 unauthorized landfills with a total area of 17.5 hectares, and there are a few dumps authorized by the municipality, which are imperfect from a hygienic point of view. Problems' concerning the accumulation and toxicity of waste needs to be solved to improve the sanitation of the environment in Chisinau. As a part of this waste treatment plants need to be constructed and organised. The waste causing the biggest threat to the ecological balance and human health in the city comes from households, followed by industries and private enterprises. Another big problem is that big amounts of waste are dumped in rivers and storm-water channels, along roads, and in public green spaces, causing big environmental pollution. Pollution of soil, mainly because of deficient dumps and burials of waste, is connected to epidemiological morbidity in Chişinău (Postolachi, L. & Vlădicescu, V. 2010, pp. 28-29).

Threats to hydrology

Flooding is an increasing threat in settlements along smaller rivers due to climate and landscape features, and poorly maintained water reservoirs. Water from these reservoirs is supposed to be used for fishing, irrigation, and domestic and industrial needs. However, soil erosion, contaminated surface runoff, waste water discharges and unauthorized waste disposals are threatening the quality and health of these surface water resources. About 50% of the Moldovan population depends upon shallow groundwater for drinking water and is directly affected by the quality of the surface water (State Road Administration, pp. 5-6).

RED LISTED SPECIES IN MOLDOVA

A selection of the Red listed species present in the surroundings of Chişinău are shown here because they are considered in the proposal for future development of River Bîc, in an attempt to create suitable habitats and encourage the use of native species. These species are also a part of the natural heritage and are important for the identity of place.

Human activity has in the last 20-25 years drastically reduced the number of animal and plant species due to fragmentation and aggravation of life conditions. The main reason lies in the excessive development of agricultural lands, forestry, pollution of soil and aquatic resources, and the reduction of surfaces with natural vegetation. The endangered and threatened species are presented in a Red Data Book, developed according to the Classification of the International Association of Nature Conservation (INAC). The second edition of Red Data Book of the Republic of Moldova published in 2002 includes 126 species of plants and 116 species of animals, which can be compared to the first edition from 1978 with 26 species of plants and 29 species of animals (Boicu D., Boicu, E. & Barbâră, E. 2002, pp. 5-6).

FOREST


Figure 46: Athyrium filix-femina


Figure 47: Cephalanthera damasonium


Figure 48: Chrysopogon gryllus


Figure 55: Galanthus nivalis


Figure 56: Lunaria annua


Figure 57: Nectaroscordum bulgaricum


Figure 40: Dryopteris carthusiana


Figure 41: Euonymus nana


Figure 42: Fritallaria meleagroides


Figure 49: Climaticum dendroides


Figure 50: Cornilla elegans


Figure 51: Daphne mezereum


Figure 58: Ophioglossum vulgatum


Figure 59: Orchis morio


Figure 60: Orchis purpurea


Figure 43: Pulsatilla grandis


Figure 44: Pyrus elageagrifolia

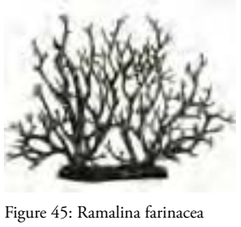


Figure 45: Ramalina farinacea


Figure 52: Delphinium fissum


Figure 53: Dicranum scoparium


Figure 54: Digitalis lanata


Figure 61: Peltigera canina


Figure 62: Pleurozium schreberi


Figure 63: Pseudevernia furfuracea

FLOODED HAYFIELDS

Figure 64: Calliergonella cuspidata

Figure 65: Dactylorhiza majalis

Figure 66: Eriophorum latifolium

Figure 67: Orchis palustris

Figure 68: Rhaponticum serratuloides

Figure 69: Mantis religiosa

WATERS

Figure 70: Nymphaea alba

Figure 71: Salvinia natans

Figure 72: Emys orbicularis

FOREST

Figure 73: Eudia pavonia

Figure 74: Elater ferrugineus

Figure 75: Felis silvestris

Figure 76: Martes martes

Figure 77: Morimus funereus

Figure 78: Mustela erminea

Figure 79: Pelobates fuseus

Figure 80: Rutilus frisii

Figure 81: Aglia tau

Figure 82: Calosoma sycophanta

Figure 83: Dryocopus martius

Figure 84: Lucanus cervus

Figure 85: Mustela eversmanni

Figure 86: Satanas gigans

Figure 87: Tyto alba

Figure 88: Pernis apivorus

Figure 40-88: Pictures of redlisted species in Moldova. Source: *The Red Book of the Republic of Moldova: Second edition*, 2002

TODAYS PLANNING FRAMEWORK IN CHIŞINĂU

The environment in Chişinău is regulated by ambitious legislations which have to be considered and followed when planning the green structure. This chapter will give a short presentation of these laws and regulations. It will also present the planning principels in Chişinău today and give the perspective of the city planning department, their engagement with non-governmental organisations and the civil society.

LAWS AND REGULATIONS OF GREEN SPACE IN CHIŞINĂU

The ministry of Ecology and Natural Resources (MENR) is responsible for laws concerning the environment and the State Ecological Inspectorate (SEI) helps implement them (Belka, M. 2005, p.21). To understand how the green structure in Chişinău is planned and maintained we must comprehend the Moldovan laws regarding the green environment.

The Constitution of the Republic of Moldova, 1994
According to the Constitution the people of Moldova must be aware of their responsibilities towards the past, present and future generations (Parliament of the Republic of Moldova 1994).

Law on Urban and Rural Green Space, 1999
The law regulates relations in the development and protection of urban and rural green areas and ensures the right of each person to a healthy and aesthetically pleasing environment (Parliament of the Republic of Moldova 1999).

Law on Environmental Protection, 1997
This law obliges local authorities to carry out environmental protection measures, prevent environmental threats, minimize waste and generate sewage treatment plants (Postolachi, L. & Vlădicescu, V. 2010, p. 43).

Law on the Payment for Pollution of the Environment, 1998
This law concerns harmful economic activity, any environmental damage, stimulation systems for capturing and neutralizing pollutants, and implementation of non-polluting technology (Postolachi, L. & Vlădicescu, V. 2010, p. 46).

Law on Ecological Expertise and Environmental Impact Assessment, 1996
According to this law, citizens of Moldova have the right to request information about new developments and its impact on the environment. Also, the law commands an awareness of the impact on protected areas from new developments (Belka, M. 2005, p.27, 29).

Law on Natural Resources, 1997
This law ensures ecological security and sustainable national development through regulations on the use, protection and renewal of natural resources (Postolachi, L. & Vlădicescu, V. 2010, p. 44).

Water Code, 1993
This law regulates the concentrations of pollutants released into watercourses (Belka, M. 2005, p.27).

Land Code, 1991
Urban lands are managed by local public authorities or municipalities on municipal land property and must be used according to land use plans (Parliament of the Republic of Moldova 1991).

Forest Code, 1996
This legislation regulates the sustainable management of forests and concerns restoration, protection, maintenance, preservation and enhancement of the biological diversity (Parliament of the Republic of Moldova 1996).

Law on Atmospheric Air Protection, 1997
This law regulates activities polluting the atmosphere, and regulates the preservation, prevention and improvement of air quality (Postolachi, L. & Vlădicescu, V. 2010, pp. 44-45).

Law on Industrial and Domestic Waste, 1997
Here regulations are set on the production and management of waste to prevent environmental pollution (Postolachi, L. & Vlădicescu, V. 2010, pp. 45-46).

The law on the Fund of Natural Areas protected by the State, 1998
The law includes a list of the protected areas and species in Moldova and authorities responsible for their protection and management (Belka, M. 2005, p.29).

The European Landscape Convention, 2000
The European Landscape Convention was adopted on 20 October 2000 in Florence. It covers natural, rural, urban and peri-urban areas including land, inland water and marine areas, and it aims "to promote landscape protection, management and planning, and to organize European co-operation on landscape issues" (Council of Europe 2000, Article 3). Moldova signed the European Landscape Convention in 2000 and it entered into force in 2004 (Treaty Office 2012).

The spatial planning of Chişinău

There is an extensive planning work of Chişinău already today. At the municipal website, Chişinău.md, you can easily find documents related to city planning. As a citizen you can also get planning information visualised through the E-Urbanism Chişinău application. This is a GIS-based map where you can interact by means of turning on and off different layers to view the information.

About the planning documents

There is one Planul Urbanistic General al Municipului Chişinău which could be translated to General Urban Plan. This document persists mostly of text and tables with an evaluation of the General Urban Plan from 1998, what was implemented and what was not. It also gives a vast description of the conditions of Chişinău today. To this document there is Anexe la Planul Urbanistic General al orasului Chişinău (Annex to General Urban Plan) with data from the statistical yearbook of Moldova.

Further, there is a plan that is valid today; Planul de Amenaiare a Teritoriului municipului Chişinău/ Spatial Plan Chişinău (PAT). The Spatial Plan for Chişinău is a territorial development strategy which is equivalent with what we in Sweden call a comprehensive plan. PAT is a result of a cooperation between the City Council and the United Nations Development Program (UNDP) Moldova, the City council is beneficiary and UNDP Moldova the work contractor. The plan is developed in the context of the Millennium Development Goals and stretches over the time period 2004-2025.

The document presents data and information collected through public meetings, interviews with elected and appointed officials, for how Chişinău should develop to reach the goal to be an attractive area for the daily life of residents and strategic location of businesses.

The aims of the strategy are based on the three pillars of European Spatial Development Perspective (ESDP 1999, p. 7). The pillars represent the three fundamental goals of European policy and should be achieved equally in all the regions of the EU:
• Economic and social cohesion;
• Conservation and management of natural resources and the cultural heritage;

• More balanced competitiveness of the European territory
These pillars then raise two components of implementation: (1) Identifying and designing actions in forms of territorial attractiveness by developing basic infrastructure and (2) Direct action in the economic, social, cultural and environmental disparities.

Disposition of PAT

The plan is structured in five chapters. Introduction, describing the general context, strategies and methods. Audit development factors, investigates Chişinău on three coordinates: territorial functionality, territorial competitiveness on a national and European scale and promoting environmental and built heritage. This is done by for example describing the administrative territorial divisions, demography and land resources. For example what land use and what types of housing there is in the present and public services as transports, economy and electricity. It ends with a SWOT-analysis and an action plan for the problems found and a conclusion. The Vision chapter describes the vision and development objectives such as, economic landmarks, social and territorial cohesion of the city, drawn from the SWOT analysis preformed in the previous chapter.

Vision 2025:
"*A poly-centric economic core, dominated by clean productive activities and tourism, a place for comfortable life with access to utilities and public services in an unpolluted environment; A multicultural landscape, an attractive destination in Europe through various modes of expression: language, music, architecture archaeology etcetera.*"

Politics and Implementation, proposes a package of policies, programs and sectorial and regional policies to ensure a way to reach the visions.
Territorial administrative units, towns, communes and villages that compose Chişinău municipality are required to design their own plans at the time period of PAT, based on the provisions of this plan and in accordance to the legislation.

The green planning perspective

According to [4]Nicolae Craicun there are no Landscape Architects working at City Hall for the present, and there is no department specialized on green space. 4Craicun told us that a major task for his department, which is responsible for the green space, is to update the existing identification of green space in Chişinău. The last inventory took place in the beginning of the 21st century and is no longer accurate due to recent developments in the city. However, for the new information to be adapted and implemented on the green space a complicated process has to be undertaken. Ecological and environmental expertise within central authorities needs to be included and new information needs to be approved by the Ministry of Environment and the Municipal Council. The information is thereafter sent to Spaţii Verzi, the municipal enterprise managing the green areas in Chişinău.

Landscape architects in Moldova

During the architect education at the Technical University of Moldova, the students in the fifth year out of six have a mandatory course in landscape architecture which [5]Alina Ostopov has been teaching for two years. But there is no landscape architect education in Moldova, as there is in Romania. According to [5]Alina there is no firm where only landscape architects work, and landscape architecture is not prioritised in Moldova. Green spaces are a low priority and buildings are designed without concern to the existing surrounding landscape. Instead, they are built very densely which leaves little space for public spaces and parks.

According to [9]Alexandru Covalendru, the head of the building company Constructiv, there is no cooperation between the landscape architects and architects in Chişinău and there are no landscape architects in City Hall. Architects are planning and designing new green areas instead of Landscape Architects. In Soviet times there were strict rules guiding where constructions could take place and where green space was supposed to be. According to Soviet rules all residential areas should have green space. The size of green space were specified based on the number of residents, general recommendation was 40 square meters green space per person, says [4]Craicun. Today people do not respect those restrictions as much and the green spaces are threatened to be exploited, tells [9]Covalendru.

Public involvement

All approved documentation on city planning is published on the City Hall website and the General Urban Plan was exposed to the public before it was approved. Though it is vague, according to [4]Craicun, how much of the public opinion actually is included in the result. He elucidates the problem in separate mentalities and approaches to planning between the old and new planning schools. Planners and architects from the old school lean on their own expertise for a good result, while the new school would rather cooperate with other fields of knowledge. [4]Craicun insists that the civil society has a great interest in green areas and should be included in the planning process more than they are today.

[2]Vladimir Us explains that Moldova has transformed from a totalitarian system to a system with its own rules and new requirements for planning. After the independence in 1991 an intense process of land privatisation started. As a result, most new constructions are supermarkets, offices or luxurious residential areas financed by private investors, and little attention is given public space. Another phenomenon in Chişinău is that old buildings are being torn down to give way for new constructions, which most often are not very well integrated into the surrounding environment. According to [2]Vladimir it is a blurry process taking place in a very non-transparent way with little legal and public support. Public areas are decreasing due to informal agreements where public areas are secretly privatised.

Non-Governmental Organisations

The General Directorate of Architecture, Urbanism and Land Relations works with NGO's such as the Ecological Movement of Moldova and Chişinău Territorial Organisation to commission studies. [4]Craicun says, however, that they are working separately and that o be able offer NGO's involvement in bigger projects a strategic plan is needed to organize the work.

During our field study we met many people, most of them young, interested, and engaged in the future development of the green and public spaces of Chişinău. Some of them work for an NGO and some of them are people just caring for the environment they meet every day. The knowledge and engagement within the civil society bears the success of a socially sustainable city development. A possibility for the future could be a combination of the two planning schools with the use of Star-planning, where top-down and bottom-up planning are combined. It is a way to create a balance between the competence of planners and architects, and the knowledge of people using the city everyday (Berg, P. G., Göransson, S., Hellqvist, P., Lindström, E., Ranger, A. 1996, p. 7).

[4]Nicolae Craicun, Service for Land Relations, meeting, 16 Januray 2012.
[5]Alina Ostopov, Technical University of Moldova, meeting, 22 November 2011.
[9]Alexandru Covalendru, Constructiv, meeting, 1 December 2011.
[2]Vladimir Us, Oberliht, meeting, 11 November 2011.

RESULT OF INVENTORY AND ANALYSIS

GREEN INFRASTRUCTURE

In this chapter we present the inventory and analysis of green infrastructure, as well as road and railway network in the municipality. A Lynch-analysis and a deficiency analysis are also presented.

INVENTORY OF GREEN INFRASTRUCTURE IN THE MUNICIPALITY

The municipality of Chişinău has a rich supply of green space, but most of the existing forest areas are fragmented due to agricultural activity. The forest areas shown on the plan are remnants of the forest that covered most parts of Moldova 500 years ago ([8]Coseru). These forest areas make up the fringe of the only existing contiguous forest area in the country today, the Codrii forest, lying northwest of the municipality. Southeast of the municipality the landscape is composed of forest-steppe.

Green structure

Service for Land Relations within the General Directorate of Architecture, Urbanism and Land Relations has worked with the green links within the municipality of Chişinău, shown on the plan. These links were determined in the Concepts for the General Urban Plan of Chişinău, 2004, and are defined as: "a network of of linear spaces conceived, planned and managed for multiple purposes, including biodiversity conservation, recreation, for aesthetic, cultural or any other purpose consistent with sustainable land use" (Ahern 1996 see E-urbanism 2012).

Within the city border of Chişinău the green links are mostly constituted by the forest-parks in the suburbs. In the city centre there are only small public parks and tree-covered areas, and the major green link in the city centre is the green space along River Bîc. However due to inaccessibility, waste, and pollution, the green space along River Bîc can neither be considered a blue-green link from an ecological perspective, nor from a social perspective in its current state.

Blue structure

Moreover, the plan shows the artificial lakes within the municipality, constructed in Soviet times according to [7]Mîndrilă. Except for the biggest artificial lake, the 7 kilometer long Ghidighici lake, the aquatic resources are represented by the River Bîc and its tributaries, and 18 smaller lakes. Ten of these lakes are situated in the city of Chişinău. The total area of aquatic basins is 121 hectares, about 0,2 % of the total area, with 18,7 km of coast length (Dudnicenc, T. 2009, p. 1). In comparison, the lakes in Sweden constitute 9 % of the total land area (SMHI 2008). Since Moldova is land-locked and due to the climatic conditions, of short winters and long, hot summers with small quantities of rainfall (Postolachi, L. & Vlădicescu, V. 2010, p. 10), the existing water resources are valuable to the population in many ways. According to [8]Coseru the water in Chişinău is used for irrigation, drinking, and recreation. In the chapter about River Bîc we will write more about the issues and opportunities concerning the aquatic resources of Chişinău.

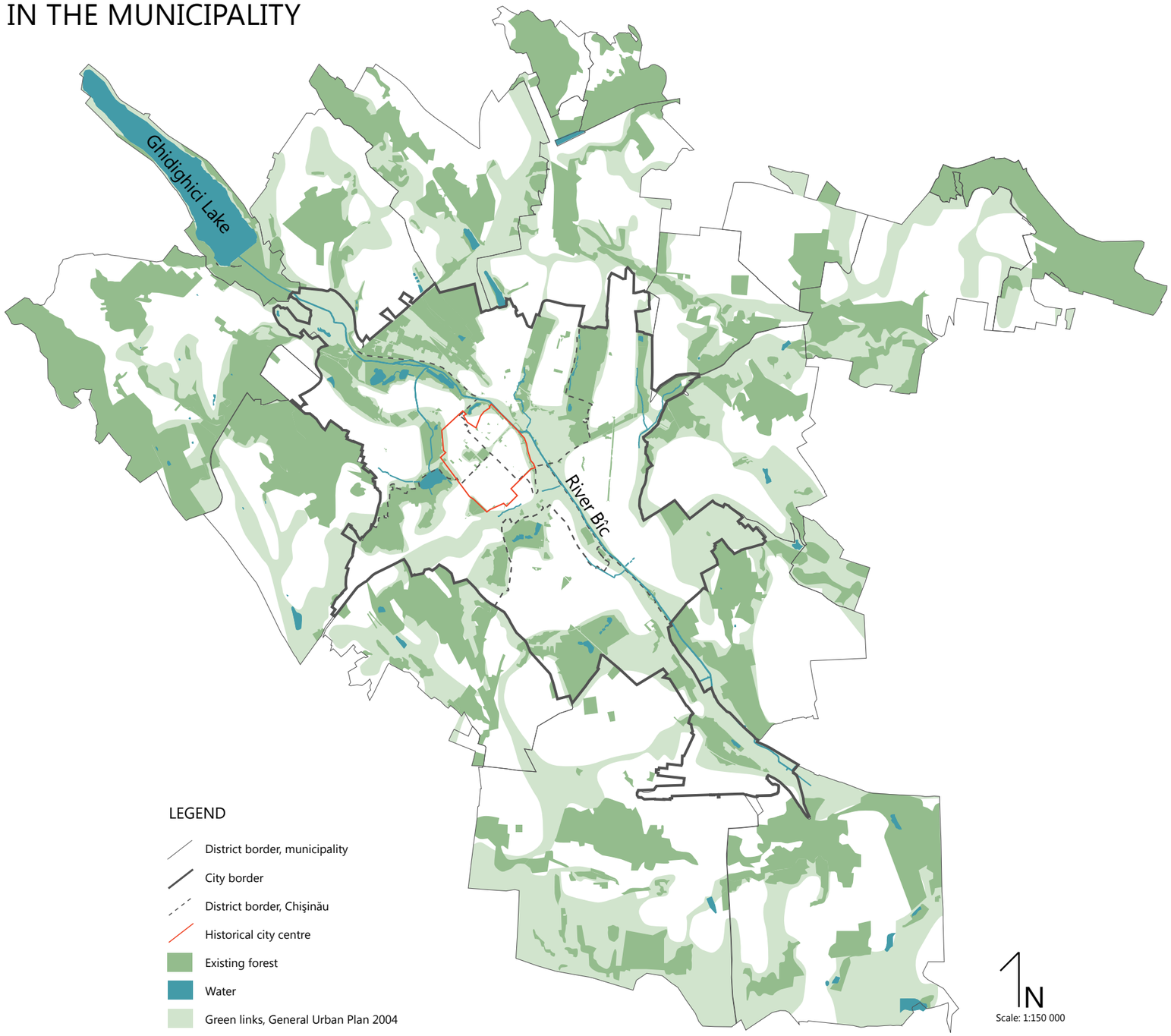


Figure 89: Plan over green structure in the minicipality with future links from General Urban Plan. Plan made by: Karin Winroth, modified from information from E-Urbanism, 2012.

[8]Ina Coseru, head of National Environment Centre, meeting, 21 Januray 2012.

[7]Pavel Mîndrilă, Deputy Technical Director of the Water Management projecting Institute of the Republic of Moldova, Acvaproiect, meeting 29 November 2011.

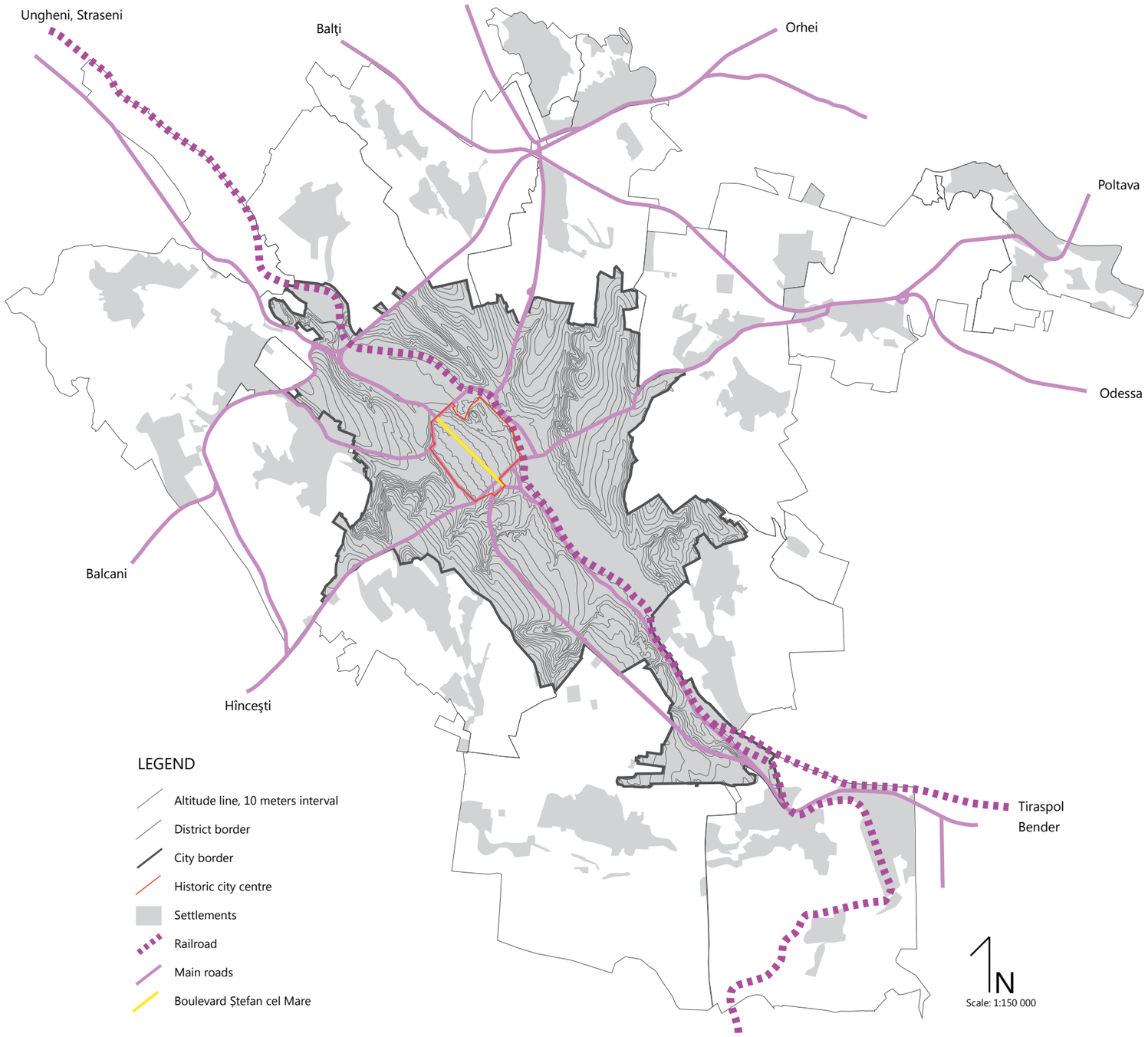


Figure 90: Plan showing the present situation of communication as railway and main roads in the minicipality . Plan made by: Karin Winroth, modified from information from Google Maps.

INVENTORY OF TRANSPORT INFRASTRUCTURE

During our field study in Chişinău we first noticed the wide roads and boulevards lined by trees going through the city. Most traffic runs along the main street, Ştefan cel Mare, which is a three kilometer long and over 100 meter wide boulevard going through the historic city centre. The biggest roads are often hard to cross for pedestrians and bicyclists due to few pedestrian crossing points and heavy traffic.

Road network

The plan shows the main road network developed during Soviet times connecting Chişinău with Romania, Ukraine and other parts of Moldova (Larsson, Skoog, 2009, p.14). According to [4]Craicun, head of the service for land relations within the General Directorate for architecture, urbanism and land relations (2012), the road network leads all traffic coming from the suburbs or from outside the city onto the Boulevard Ştefan cel Mare and the main roads surrounding the historic city centre. The city centre thereby becomes exposed to heavy traffic followed by traffic congestion, air and sound pollutions. [1]Craicun tells us that another problem comes from the lack of parking spaces in the city centre. From our observations we noticed that even though the sidewalks in Chişinău are wide compared to Swedish standards, they were often blocked by parked cars. Cars also appropriated other public spaces, like squares and parks which decreases the accessibility for pedestrians in these areas.

Railroad network

Chişinău is also connected to the railroad network, which passes through the city in a north-south direction. There is a main line from Bucharest via Iași and Ungheni to Chişinău, continuing to Odessa (and Kiev). From this line there is a branch northwards to Bălți, Lipcani and Černivci/Cernăuți. Generally the railways are winding with large detours due to the topography, and the trains are slow and few. Nevertheless it would be possible to create a rather more effective rail network, if some (rather short) missing links and shortcuts were constructed, to make the line distances shorter. Development of the rail network would be an important way to promote sustainable transport, as an integrated part of the European rail system (Larsson, Skoog, 2009, p.14).

[4]Nicolae Craicun, Service for Land Relations, meeting, 16 Januray 2012.

LYNCH-ANALYSIS

Figure 91: Boulevard Stefan cel Mare works as a path, barrier and node at the same time. Photo by: Karin Winroth

Figure 95: Russian grid-net.
Photo by: Karin Winroth

We moved through Chișinău by foot and through public transport why this LYNCH-analysis of is made from a pedestrian perspective.

Barriers

The main barriers are constituted by River Bîc, the railway and the main boulevards going through the suburbs. The river and the railway cross the city in a north-south direction and has few crossings for pedestrians. The existing cross points are made for motors traffic and few of them have safe sidewalks. Some of the big parks are also considered as barriers. Either they are fenced or they are very hard to cross due to the topography or few paths leading through them.

Paths

We have included the main boulevard Ștefan cel Mare as a barrier and a path as many pedestrians move along it but have a hard time crossing it due to its width and heavy traffic. Some of the boulevards in the suburbs are also paths where people mostly walk as this is where public transport leads and commercial activity is taking place. In the city centre, on the parallel and cross-streets to boulevard Ștefan cel Mare, most pedestrian activity is taking place. These streets are crowded because of the location of most restaurants, stores, and the maxi-taxis passing by.

Nodes

Most of the nodes for pedestrians are taking place where public transport halts and people changes busses, trolley-buses or jump on a maxi-taxi. Strada Ismail is the most crowded during work hours. The Ștefan cel Mare park and the Cathedral park are marked as nodes and landmarks on the plan. Many people pass through them every day and the statue of Ștefan cel Mare is a popular meeting place. Also, the central market, the bus station, and the train station are all nodes and landmarks. Everyone knows these places and uses them regularly. Even though they are not visible from a distance one still orientates from them. Further, the shopping mall, Malldova, is both a node and a landmark visible from a distance.

Landmarks

Hugh power-lines in Ciocana and chimneys spread within industrial areas are landmarks we could see from most parts of the city. The City Gates marking the southern entrance to the city are perhaps the most famous landmark in Chișinău. They are triangular residential high-rise buildings constructed in a typical soviet style. Moreover, we consider some of the most popular parks and monuments being landmarks, as, Valea Morilor park, Valea Trandafirilor park, Dendrarium park, the Afghan soldiers memorial park, and the Victory memorial park. The memorials are visible from a far distance, and the parks are very well known by people living in the city. Finally, the abandoned circus is a well-known landmark. It is situated on a small hill next to the river and is impossible to miss when driving or walking by.

Figure 92: Stefan cel Mare is a landmark and a node. A popular meeting place among the citizens. Photo by: Johanna Hagberg

Figure 93: Example of villa district.
Photo by: Johanna Hagberg

Figure 94: Example of block in Soviet suburb.
Photo by: Johanna Hagberg

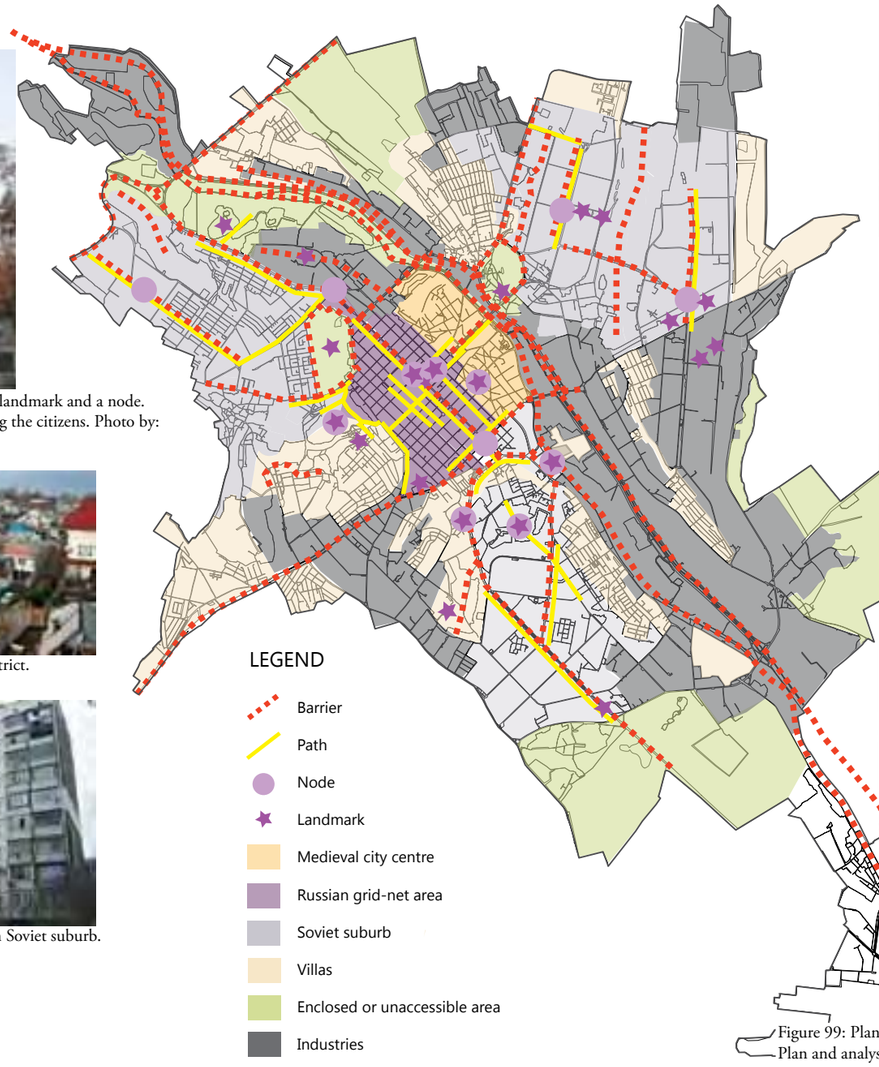


Figure 99: Plan showing the Lynch-analysis over the city of Chisinau.
Plan and analysis made by: Karin Winroth & Johanna Hagberg.

Figure 96: The old Circus is a landmark.
Photo by: Aaron Dowden

Figure 97: The railway creates a barrier and divides the city in two parts. Photo by: Johanna Hagberg

Figure 98: Industrial areas are barriers and perceived as own districts. Photo by: Karin Winroth

Districts

The districts shown on the plan are divided according to our perception of them being coherent and having a similar character. We find the medieval city centre being a district of its own because of its characteristic small scaled architecture and the irregular street pattern. The same counts for the Russian grid-net city with rectangular streets and lower buildings. The industrial areas have very clear borders and are inaccessible for pedestrians why they become vast barriers within the city. We separated main areas with villas from areas with high-rise buildings, even if they often are mixed, because of them having very different characters. The villa areas pop up here and there in between other types of architecture and have high fences and guarding dogs which makes one feel rather unwelcome walking around. The suburb areas with high-rise buildings are very static, being planned and built in a specific location. These areas are visually dominating and have a richer semi-public life in-between them with open green inner yards. Some of the green areas in Chișinău are shown as own separately as we did not find them connected to any other district. Either, they are agricultural lands belonging to the surrounding landscape, or they are enclosed by big barriers creating a mental distance to its surroundings. An example is Dendrarium park which is enclosed by high walls with few entrances making it disconnected to the ambient environment.

DEFICIENCY-ANALYSIS

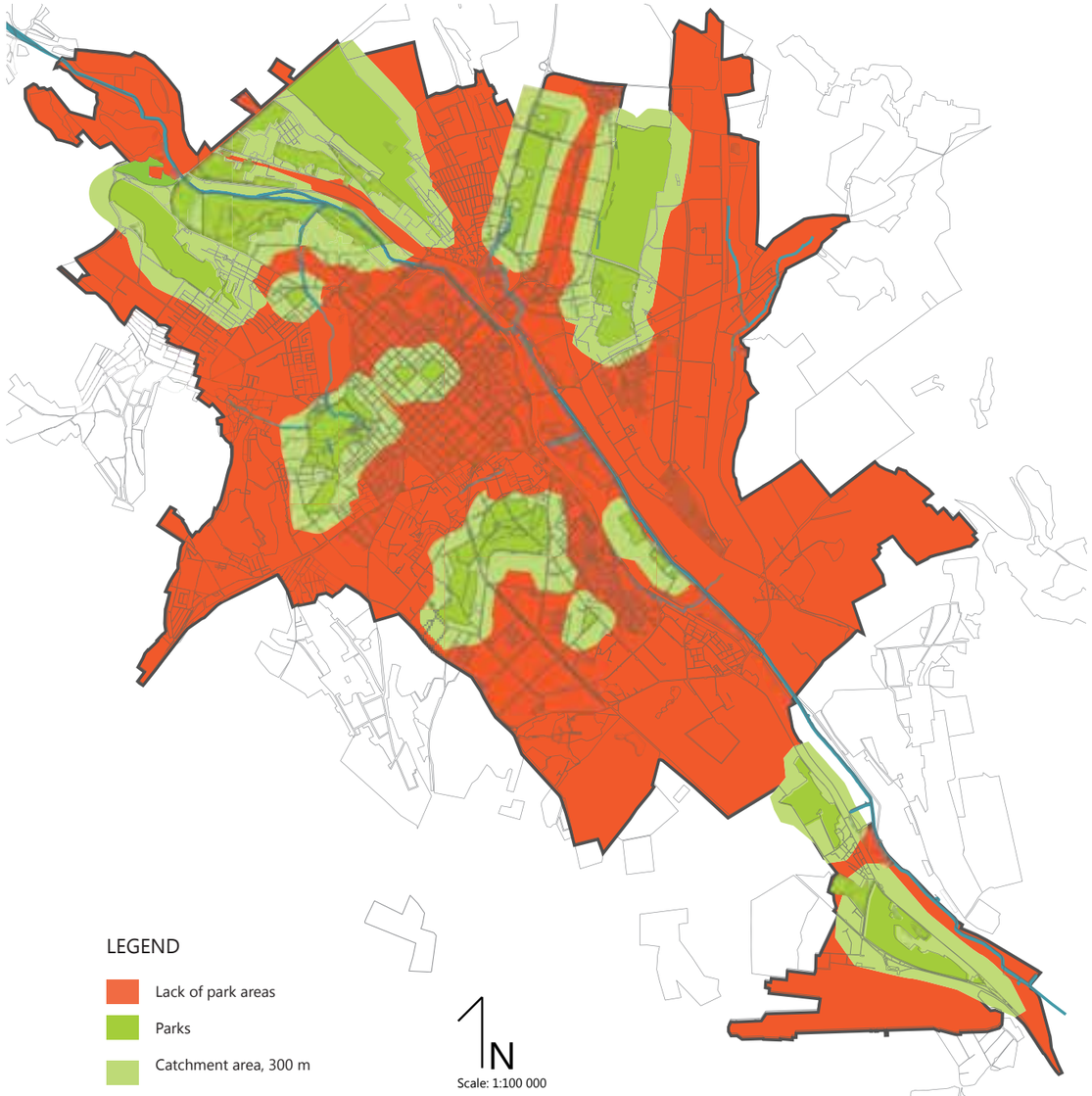


Figure 100: Plan showing deficiensy of green areas in the city of Chisinau. Plan and analysis made by: Johanna Hagberg.

This plan shows how much of the built areas that are situated within 300 meters, or closer, to a green area. The green areas included in this analysis are based on the information gathered from Spații Verzi of which parks are included in their maintenance. The distance, of 300 meters origins from the recommendations of Swedish Boverket, *Bostadsnära natur* (2007, pp.11, 14), where they illuminate the importance of having a reachable green area not further than 300 meters from your home. The darker green shows where the green areas are situated, the light green their catchment area and the orange represents the exploit areas where the green areas are missing. There are quite good accessibility to green areas in the northwest area of the city. The highest green area deficiencies can be found along the river and railway and also in the historical centre, and the east and south part of the city.

INVENTORY OF GREEN LINKS AND INFRASTRUCTURE

Inventory

Even though the public transportation in Chişinău is well developed, the existing road network needs improvements. As we have illuminated in previous chapters the traffic situation is problematic with traffic congestion and a lack of parking lots in the city centre. According to [4]Craicun there are plans on a new European road network, L1, going through Moldova from Bucharest to Odessa. When these plans are realized the number of cars passing through Chişinău will rise. To meet this situation the Strategic Committee on Sustainable Development in Chişinău (Craicun, N. 2006) has developed a proposal for a new road scheme. The proposal is to build three ring roads; one around the old city centre, a second connecting the five city districts and a third ring road surrounding the entire city.

Poly-centres

Together with the ring roads five poly-centres will be developed, four at the main entrances to the city and one next to the historic centre. Today most private businesses, commerce, service and labour is situated in the central parts of Chişinău. To release pressure on the city centre the new poly-centres for business and tourism will be constructed on free land outside the city limit, providing the suburban residential areas with business centres focused on commerce and service. [4]Craicun explains that this way, people do not have to commute through the city centre the same amount, which means the traffic situation will be improved and the historic centre will be protected.

Pedestrian street

In the city centre the business area will provide the city with luxurious offices and hotels. An old stadium will be turned into a recreational area for sports and the central market will become an area for corporate markets, souvenirs, domestic art-crafts, and for cultural events to attract tourists. Mitropolit Varlaam street going from the Cathedral Park to the central market is proposed to become a pedestrian street and the existing bus station behind the central market will turn into a square with surrounding high rise business complexes according to [4]Craicun.

Ring roads

The plan shows the new ring roads and business centres together with the green links (E-urbanism 2012). Placed together on the plan one can see that the green links and the proposed ring roads collide in some points. On the next page we will analyse this proposal from an ecological and social point of view.

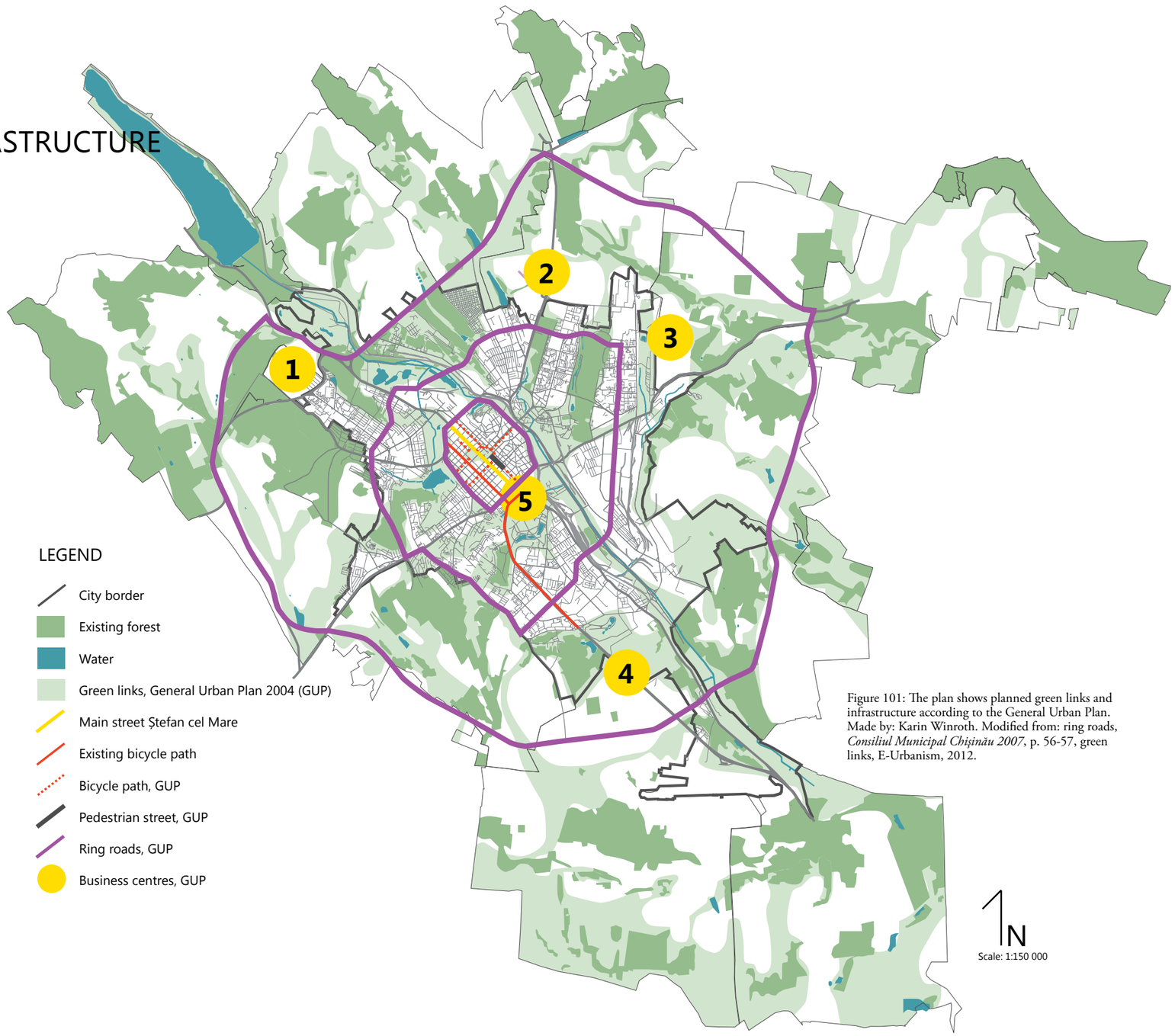


Figure 101: The plan shows planned green links and infrastructure according to the General Urban Plan. Made by: Karin Winroth. Modified from: ring roads, *Consiliul Municipal Chişinău 2007*, p. 56-57, green links, E-Urbanism, 2012.

The plan to the right shows our analysis of the proposed road network and green links in Chişinău.

Ring roads

The inner ring road has the potential to unburdening traffic from the streets within the city centre and provides an opportunity for pedestrians, bicyclists and public transport to appropriate this area. However, if traffic is concentrated along the inner ring road, it will become an increased barrier between the city centre and its surroundings. Air and sound pollutions will increase and the connection to River Bîc will be weakened.

The outer ring road will probably reduce a large amount of traffic entering the city but it will however also become a barrier between the green space outside the city and the green structure within Chişinău. The most vulnerable green links being divided are the forest areas and the water areas. A decreased amount of linked forests and water areas will threaten the domestic

[4]Nicolae Craicun, Service for Land Relations, meeting, 16 Januray 2012.

ANALYSIS OF GREEN LINKS AND INFRASTRUCTURE

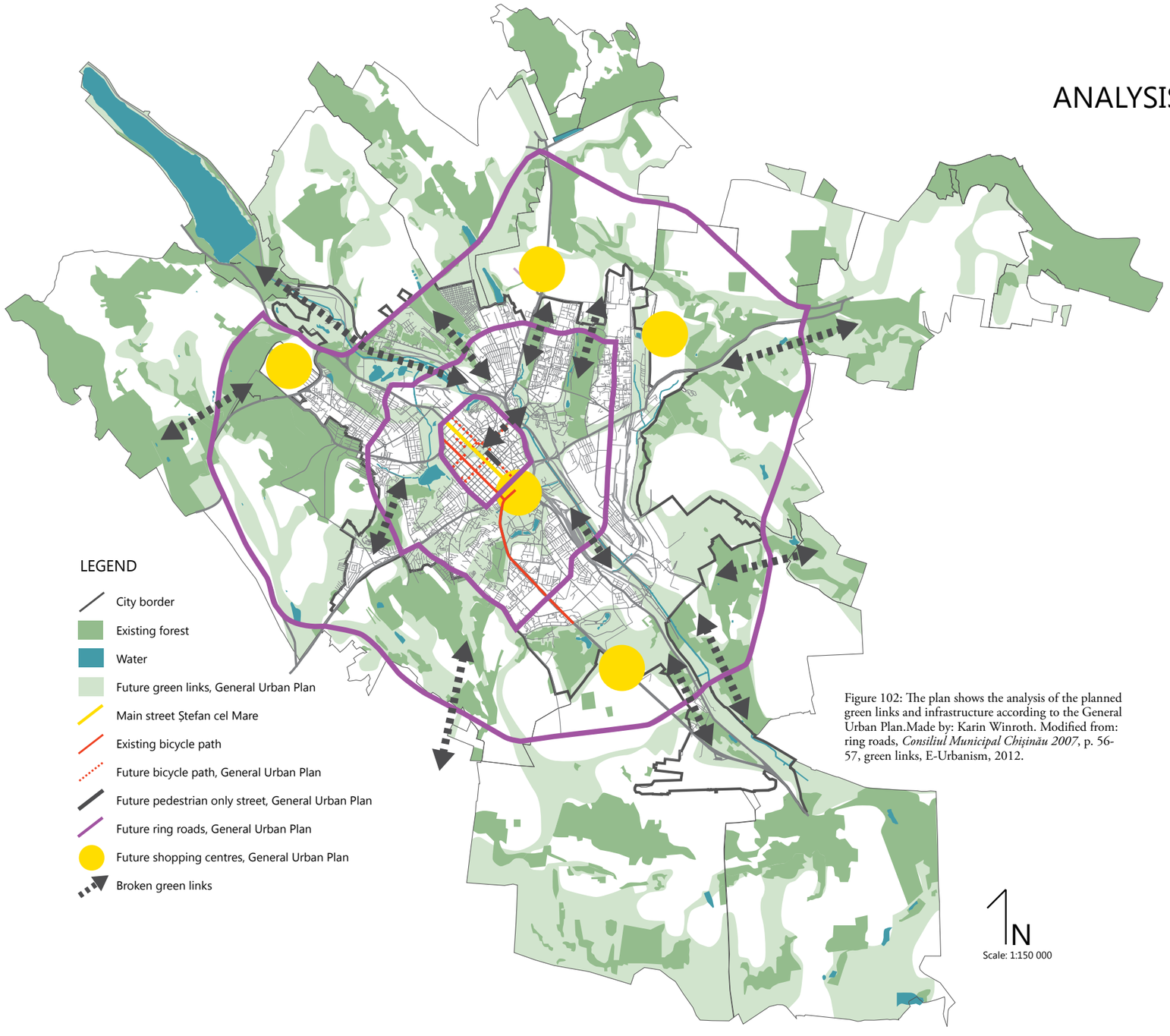


Figure 102: The plan shows the analysis of the planned green links and infrastructure according to the General Urban Plan.Made by: Karin Winroth. Modified from: ring roads, *Consiliul Municipal Chișinău 2007*, p. 56-57, green links, E-Urbanism, 2012.

flora and fauna on a national, regional, and local level, which is why the existing amount of forest and water needs to be protected and remain linked. The middle ring road will not only become a new link between the proposed business centres, but also create a new barrier through the city. A wide high-speed road with heavy traffic, cutting through the suburbs and park areas will fracture the existing green space and reduce links between the residential areas. Also, by dividing business, commercial and residential areas, the need to travel between these areas will increase.

Mixed-use development

The Commission of the European Communities published the Thematic Strategy on the Urban Environment in 2006, which highlights the importance for high-density and mixed-use development to avoid urban sprawl (Stead, D. 2011). Mixed-use development means that different types of functions, such as housing, offices, and commercial areas, are mixed together within an area, making it more diverse. The variety increases if different stakeholders, developers and designers are involved in the development of an area. Mixed-use areas are more vital and attractive, and lower rates of car ownership and usage due to the proximity of different functions (Department for Communities and Local Government 2006, p. 6). Except for developing a poly-centric city it is written in PAT (IHS Romania SR 2007, p. 52) that new residential developments should contain a combination of types of housing, public services and commercial activities, which would more easily provide residents with access to urban services, and that a development of the road network should not lead to destruction of the environment or the surrounding landscape.

Pedestrian street

The proposed pedestrian street on Mitropolit Varlaam Street, east of Boulevard Ștefan cel Mare, and the extended bicycle network are important symbols for encouraging pedestrian and bicycle appropriation in the city centre. Reducing the domination of cars in the city core is essential for sustainable development and will increase the health and life quality for the local population. A more environmental friendly way of moving through the city could make way for eco-tourism in Chișinău. Eco-tourism is a growing trend in Europe and is based on travelling with a low impact from the visitors on the local social and natural environment. This kind of tourism could support the local economy and its indigenous atmosphere (European Travel Commission).

To remove the Central Market in favour of corporate markets would change the entire character of the area. The Central Market has been located in the same place since 1825, and is already a tourist attraction mentioned in Lonely Planet as: “well worth a visit for its choice of fresh food and lively ambience” (Lonely Planet). The history and intense use of the Central Market today is an important part of the identity of Chișinău.

Sustainable public transport

The development of a new sustainable public transport system could be a way of solving the current issue with car-domination in the city centre, disconnected suburbs and wide roads creating barriers. The book, New Urban Topologies-The Chisinau and Minsk Experience, published by Färgfabriken in 2011, is based on field studies and workshops with municipal administrations, architects, urban planners, and students in Chișinău. One of their ideas was to build an aerial tram which also in itself could become an attraction for tourists. An example is the Podcar (Nätverket Kompass 2011) which is a pollution-free public transport which works in steep slopes. It also has a low operational cost by running on electricity and makes little visual impact on the environment. An aerial public transport connects residential and green areas in the suburbs without conducing barriers, pollutions and fragmentation of green space. Also it could become an interesting link to history as aerial trams existed in some parts of Chișinău during the 20th century.

PUBLIC GARDENS, PARKS and FOREST-PARKS

This chapter presents the result of inventory and analysis of public gardens, parks and forest-parks in the city of Chișinău. Including the result of a public workshop, this chapter gives information about the values of existing park areas. Also it provides an example of a method for analysis of green space, as a basis for a future diversification of the green structure in Chișinău.

GREEN STRUCTURE MANAGEMENT

Spații Verzi (Green Space) is a municipal enterprise managing over 3000 hectares of public gardens, parks, forest-parks and squares owned by the municipality of Chișinău. Their main task is to manage the green space, but in recent years they also take care of the waste management because of increased amount of waste dumped in public spaces. In total 700 people are working for Spații Verzi whereof 350-400 people are taking care of green space, including lifeguards for the artificial lakes. They have three specialists in the protection and maintenance of horticulture and two people educated for designing green space, mostly public spaces in front of representative buildings and private gardens. Spații Verzi hires Moldsilva, the State Agency within the forest domain, when new forest areas are to be planned.

Economic situation

According to [10]Galina Lehau, deputy head of Spații Verzi, the budget is too small for Spații Verzi to manage the green space in Chișinău in a desired way. For example most of the old forest-parks would need a revitalisation. They get 36-37 000 000 lei per year, and they would need at least 90 000 000 lei per year. The staff is working because they love the job, not because of the salary. During the Soviet Union the municipality had department dedicated to planning of green space. Today the planning of green space is included in the General Directorate of Architecture, Urbanism and Land Relations.

Cathegories

The green spaces, maintained by Spații Verzi, are divided into public gardens, parks and forest-parks, however the strategy for maintenance does not differ substantially between these spaces. Because of the limited budget they can only afford to maintain most green areas to a minimum. Most effort is put on the centrally located public gardens which have the highest user density. Artificial lakes are cleaned, according to the Department of Environment, every ten years, but some have not even been cleaned for 15 years. Overall, green spaces in Chișinău are popular and well used as most people do not afford to go far outside of the city.

Future

According to [10]Lehau the only salvation for green spaces of Chișinău in the future is if the budget for management will grow. Trainings are made to make the budget more efficient and there is an enthusiasm among people to work with green spaces but there is no money. There have even been plans to turn the green spaces into private property. The municipality need to realise the value of green space and the need for maintenance if they do not want to lose the most valuable part of the city. [10]Lehau is however hopeful for a better future for green spaces of Chișinău.

Figure 103: The plan shows which green areas that are managed by Spatii Verzi and their devision of green spaces in public garden, park and forest-park. Made by: Karin Winroth. Modified from information recived from Galina Lehau at Spatii Verzi.

[10]Galina Leahu, Deputy Head of the Association for Management Spații Verzi, meeting 1 December 2011.

Definition of Park Categories in Moldova

The different categories of parks and green space are defined and classified in the law on urban and rural green space (Parliament of the Republic of Moldova 1999).

Green spaces of general character are defined as harmonized architectural complexes consisting of the built landscape of urban and rural areas. Some examples are landscapes, areas of watercourses and water bodies and road constructions. The aesthetic, biological and environmental values are important, including the combination of vegetation (woody tree, shrub, floricultural and herbaceous) and animals.

Park, is a green space with an area over 20 hectares, which offers a rich and varied vegetation structure. It gives opportunities for recreation and activities in the field of active rest as sports, outdoor games and passive or nature activities as for example cultural events.
Forest-park, is a result of the aim to create place for recreation and leisure in existing forest massifs for use in the urban area. The area offers shelter for visitors, camping sites, sports fields, water facilities etcetera.

Public garden, covers an area of about 3-20 hectares, offering rest and recreation of the inhabitants living in surrounding areas on a daily basis. Included are areas planted with trees and decorative shrubs, lawn and flowers.

Green thoroughfares (Green across traffic arteries), are alignments of trees and vegetation strips of different width, depending on character and important artery, to improve urban ambience and to create aesthetics passages.

Table of maintenance

CHATEGORIES	High maintenance	Medium maintenance	Low maintenance
Public garden	X		
Park	X		
Forest-park			X
Green thoroughfares		X	

Figure 104: The table shows the relation between different park categories and level of maintenance. Made by Karin Winroth.

Orientation

On the next pages the result of the inventories and analysis will be presented. These results are the fundament for our proposal but should also be seen as groundwork material for further inventories and analysis of the green space in Chişinău.

We have observed that most park trees are of high age and there is a need of revitalisation of plant material, and that the centrally located parks often miss a shrub layer. However further inventories of single species needs to be done as well as analysis of missing park characters.

The result for the following green areas will be presented on the next pages:

Public Gardens

* Stefan cel Mare Garden
* Cathedral Garden
* Alunelul Garden

Forest-Parks

* Rîşcani Forest-park
* Calea Orheiului Forest-park

Parks

* Valea Trandafirilor Park
* Rîşcani Park
* La Izvor Park
* Valea Morilor Park

Not maintained by Spaţii Verzi

* Botanica Garden
* Dendrariu Park

Symbols for activities

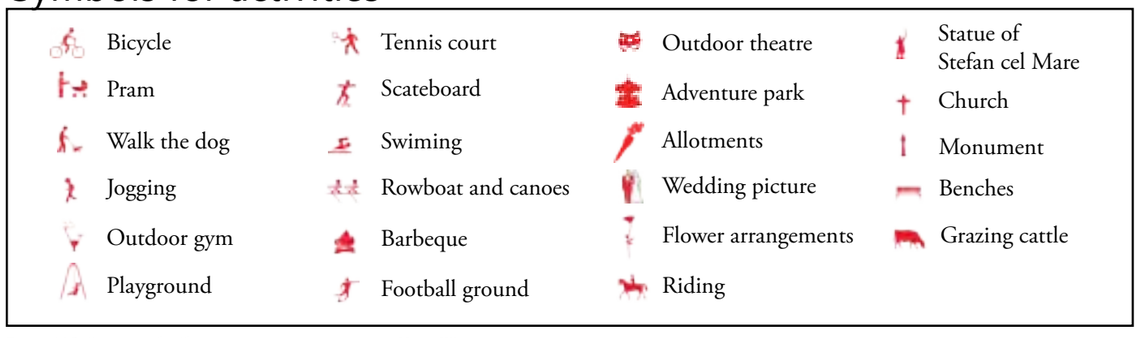


Figure 105: Symbols of different activities i parks made by Karin Winroth.

CENTRAL GARDENS

Figure 106: Paths in Stefan cel Mare park.
Figure 107: Statues at the Alley of Classics.
Figure 108: Cathedral an bell tower.
Figure 109: Old fountain are used as skate-park.
Figure 110: Child feeding pidgeon.
Figure 111: Acer platanoides "Globosum" in Cathedral park.
Figure 112: Statue of Stefan cel Mare.
Photos by: Johanna Hagberg

Inventory

The public garden Ștefan cel Mare și Sfânt was built in 1818, together with the grid-net plan in the beginning of the Russian Empire, and is the oldest planned green space in Chişinău. It is 7 hectares in size, covered by vast old tress and situated next to the main boulevard, Ștefan cel Mare, in the city centre. A statue of the old king, Ștefan cel Mare și Sfânt (Stephen the Great and Saint) is placed in a corner of the public garden and is a popular meeting place. One of the many paths in the public garden, the Alley of Classics, is framed by busts of famous Moldovan cultural personalities. In the 19th century it was filled with flower beds and required an entrance fee (Allmoldova 2012).

The public garden was opened up in the Soviet times (Larsson, B. & Skoog, G. 2009, p. 34) and today it is mostly used for walking, resting, socialising and playing. It has four fountains and on one of them young people often skateboard. It also has a new playground and outdoor gym. It is one of the most well maintained green spaces of Chişinău and one of few places in the city well-equipped with street lights which, together with its central location, generates life also in evenings when it is dark.

On the opposite side of the main boulevard, Stefan cel Mare, lies the Cathedral public garden which is about 9 hectares in size and was built in 1836. It is also covered by high old trees and in the middle of it lies the Cathedral Nașterea Domnului (Allmoldova 2012). On the opposite side of boulevard Stefan cel Mare lies the main square, Piața Marii Adunări Naționale (Square of the Great National Assembly). It is a vast area of asphalt where people gather for protests, concerts or the Christmas market, though most of the time the square is empty. On the west end of the Cathedral public garden stands the Arch of Triumph which was erected in 1840-41 (Larsson, B. & Skoog, G. 2009, p. 24). People mostly use the public garden by sitting on benches, independent of the time of the year, feeding doves or strolling around. We also saw people using its harder surfaces for roller-skating. Due to its central location and connection with the surrounding streets it is a crossing point which many people pass through every day (Allmoldova 2012).

The public gardens are mainly surrounded by public service, dashed with residential areas built in different time-periods. Most of the buildings are lower, 1-3 storeys high, but in recent years high modern buildings have been constructed here. Since many people pass the area every day and the public gardens are rather small, they become very worn.

Analysis

These public gardens lie in the heart of Chişinău and they both have the decorative park character. The ornamentation in public garden Ștefan cel Mare și Sfânt consists of historic statues, flower beds, and fountains. It is definitely a place where you breathe the culture and history of Chişinău, while slowly strolling on the strictly arranged paths.

In the Cathedral public garden the ornaments consist of architecture rather than statues and fountains. The main focuses are the Arch of Triumph on the west end and the Cathedral in the middle, to which all the paths lead. In the Cathedral public garden cultural and religious symbols are whisper the history of Chişinău. The Piața Marii Adunări Naționale has a more festive

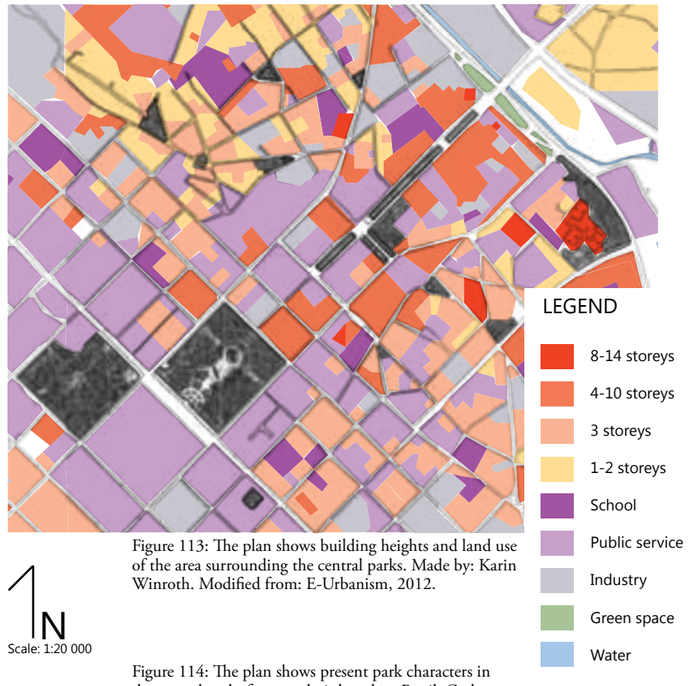
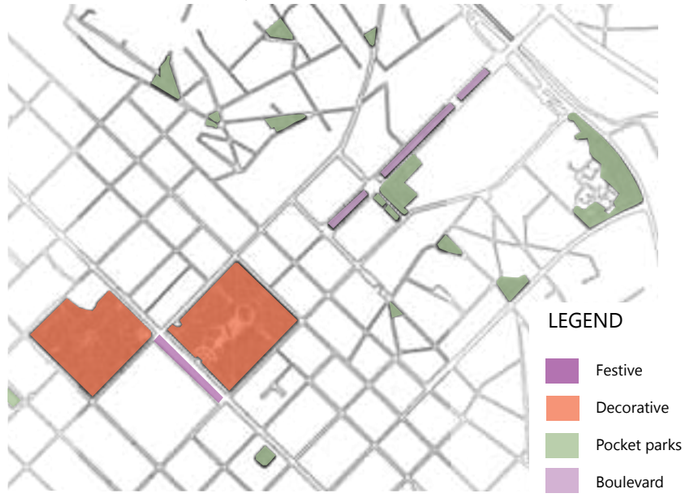


Figure 113: The plan shows building heights and land use of the area surrounding the central parks. Made by: Karin Winroth. Modified from: E-Urbanism, 2012.

Figure 114: The plan shows present park characters in the central parks from analysis based on Patrik Grahns research. Made by: Karin Winroth.



character, especially during Christmas time when different festive activities take place here.

The two public gardens are formal versions of a typical English park. They have straight paths leading to the central areas, where either a grand fountain or the Cathedral catches one's attention. The tree-layer gives the public gardens a very natural expression on top of the formal, as a contrast to the hard-surfaced city centre. Still, they are rather open and light, as they have few shrubs disturb your view.

ALUNELUL GARDEN


Figure 115


Figure 116


Figure 118


Figure 117


Figure 119


Figure 120


Figure 121

Figure 115: Spatii Verzi workers taking a break in Alunelul park.
Figure 116: Main entrance.
Figure 117: 1903 Memorial
Figure 118: Summer theatre
Figure 119: Main axis of the park.
Figure 120: Characteristic path lined by trees.
Figure 121: Southwest border of the park.
Photos by: Karin Winroth

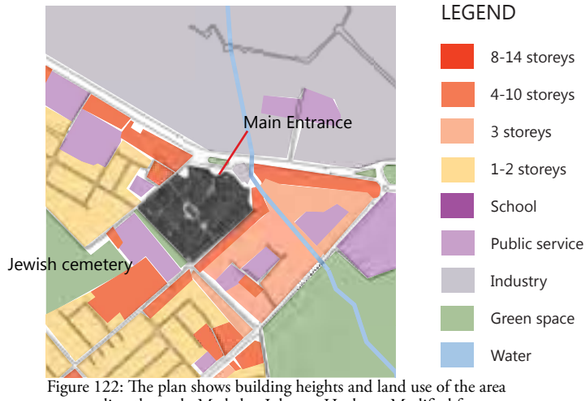


Figure 122: The plan shows building heights and land use of the area surrounding the park. Made by: Johanna Hagberg. Modified from: E-Urbanism, 2012.

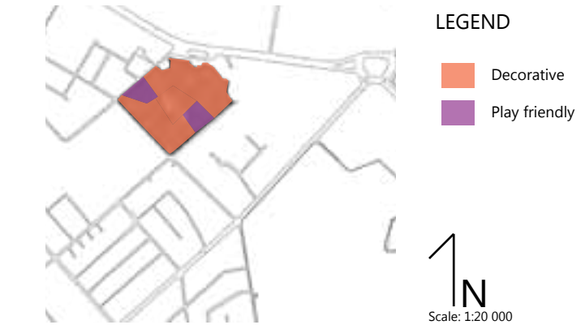


Figure 123: The plan shows present park characters from analysis based on Patrik Grahns research. Made by: Johanna Hagberg.

Inventory

Alunelul is a public garden in the English park style of about 8 hectares. Its characteristics are alleys of trees along the paths with green benches. Alunelul means the little hazelnut in Romanian and is the name of a Romanian folk dance. The park contains a small summer theatre and two playgrounds for children, one new and one older. The main entrance is at the north short side and is marked by several Picea pungens glauca. Within the park is the 1903 Memorial to the Jews that were killed in the 1903 pogrom. It is popular among the older generation to sit on the benches and talk here.

On the southwest side of the park is a school sportive for tennis and behind it a Jewish cemetery. On the northwest and the southeast sides are residential areas with villas (1-2 levels), 3 levels and 4-10 level buildings. In the north opposite of Calea Iesilor is a large industrial area.

Analysis

The public garden, Alunelul, have the same characters as the two central parks. The trees aligning the paths contribute to a strict and decorative feeling and the entrance marked by Picea Pungens is typical for parks from Soviet time. This together with the monument of the pogrom gives the park an important connection to the history of Chisinau and the Jews. The two playgrounds, which is the result of adding new equipment without removing the old one, make the park popular among children and families. The summer theatre gives the opportunity to have events like small concerts or plays, which is essential for the festive character. The activities and characters of this park attract people of all ages and is a meeting place for different generations.

VALEA TRANDAFIRILOR PARK

Inventory

Valea Trandafirilor (Rose Valley) park is situated in the south-eastern part of the city and is surrounded by typically Soviet styled residential areas with 4-10 storey buildings enclosing schools, public service and parks. In the northern parts there are bigger coherent areas of public service, industries, and buildings with 1-3 storeys. A residential 5-storey complex is being under construction in the western part close to the bridge. The park used to be a over 58 hectare big green area with vast rose plantations but was turned into a park in the Soviet times (Allmoldova 2012).

Today the park area is divided by a heavy trafficked bridge. The northern part is well-maintained and is a popular destination for people living in the district. This part of the park bears three artificial lakes, 50 different species of trees and shrubs, ordered boulevards, worming paths, a ferry wheel and two restaurants. Besides that it offers activities like running, strolling, biking, pedal-boating and resting.

The southern part is not as well maintained and has a more wild forest-like character. A stream runs through the area with traces of paths going along it and former open glades are almost overgrown and filled with litter. The central part of this area is occupied by housing, but as we walked through the park we did not meet a single person. The only sign of life here were the many stray dogs we confronted.

Analysis

From the main entrance to the northern part of Valea Trandafirilor park a grand stair leads you down to the lakes and continues through the park as a wide boulevard. This area has a typically ornamented character with decorative statues, flower beds, and the artificial lakes. However, these ornaments are falling apart and desperately need revitalisation. The same goes for the lakes which are polluted and need cleaning. In the northern parts of the park the character is more peaceful with glades of planted trees and bushes. Walking within this area makes you feel less aware of the constant traffic noise coming from the bridge. Within the more peaceful area there are two smaller areas, having the sport character, equipped with tennis courts and outdoor gyms. The mix of park characters in the northern part contributes to a varied experience and many opportunities for different activities. People come here for different reasons but due to the size of the park the disparate activities do not disturb each other.

The south part does not visually feel connected to the northern part, even though they are physically connected by a road going under the bridge. This part is closest to a wild character, but due to the litter it does not really feel "natural" in the way the wild character is supposed to. Also, the private housing area in the middle of the park does not feel inviting for anybody to pass. Even though the park is abandoned today it has a foundation to be built on and is a potential resource for the residential areas surrounding it. If it is better connected with the rest of the city, cleaned of waste, and maintained as a park with a wild character, combined with new park characters and functions, it has the opportunity to become a well-used district park. A new way of experiencing the park would be added if the connections between the north and south areas were reinforced by pedestrian and bicycle paths.

Figure 124: Main boulevard
Photo by: Johanna Hagberg

Figure 125: Man fishing in artifical lake
Photo by: Johanna Hagberg

Figure 126: Pedal boats
Photo by: Karin Winroth

Figure 127: Mobile commercial service
Photo by: Karin Winroth

Figure 128: One of the three artificial lakes
Photo by: Johanna Hagberg

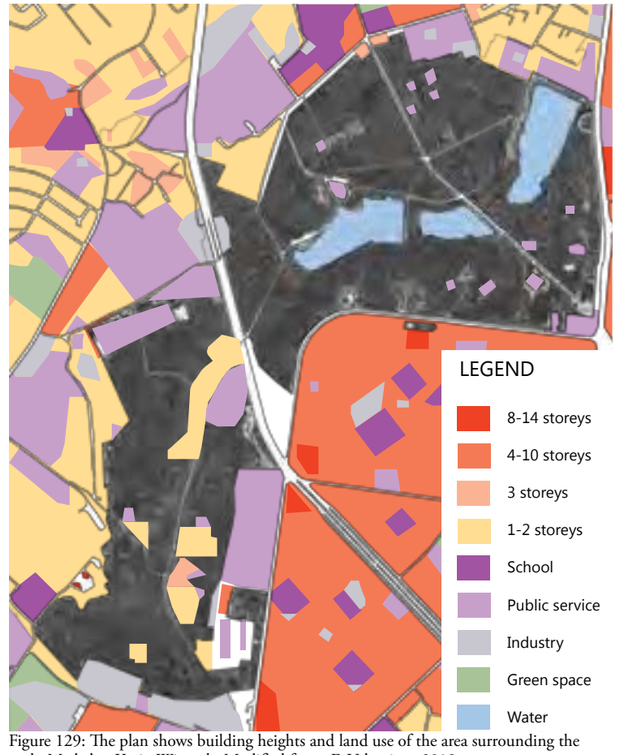


Figure 129: The plan shows building heights and land use of the area surrounding the park. Made by: Karin Winroth. Modified from: E-Urbanism, 2012.

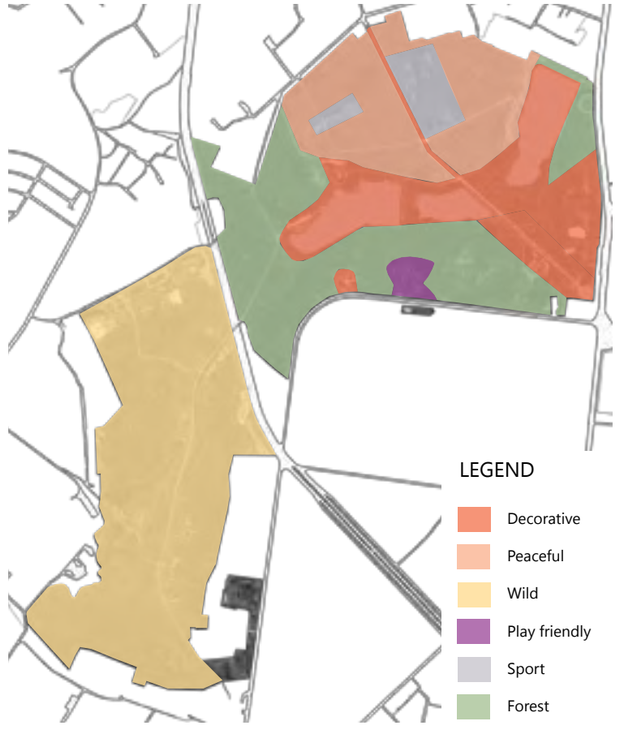


Figure 130: The plan shows present park characters from analysis based on Patrik Grahns research. Made by: Karin Winroth.

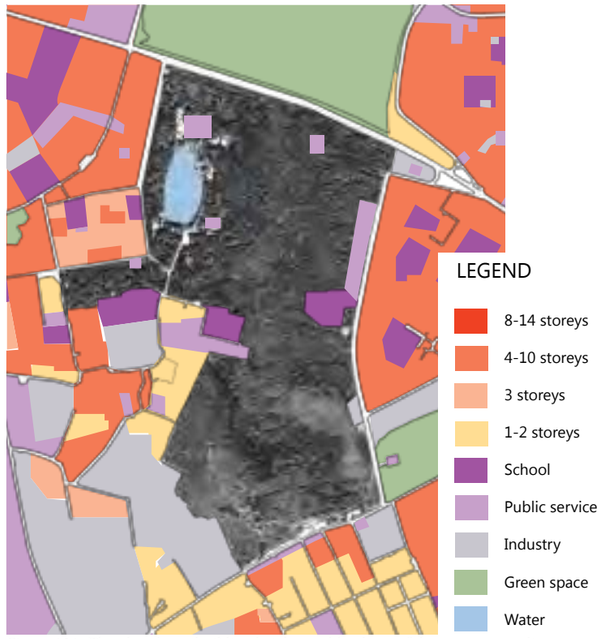


Figure 131: The plan shows building heights and land use of the area surrounding the park. Made by: Karin Winroth. Modified from: E-Urbanism, 2012.

Inventory

Rîşcani park is a 32 hectare park constructed 1970 in the north-eastern part of Chişinău. It is a green wedge placed on the slope between Rîşcani and Ciocana. The park is surrounded by dense high-rise buildings from Soviet times in the east and the west, and mostly by industries and villas in the south. It lies in connection to Rîşcani forest-park in the north, but they are physically separated by an elevated road. The native tree species white acacia, silver linden, lombardy poplar, and weeping willows, are planted here (Allmoldova, 2012), and most of the park is tree-covered. On the hills in the south smaller open areas offer long views of the city. The area surrounding the big artificial lake in the north-west is the most maintained part with paths and benches. Here people stroll around or have barbeques and enjoy the view over the lake. Also, there is an amusement park here. Along the eastern side there are steep forest covered slopes which people mostly use for promenades or jogging. As shown on the plan, parts in the middle of the park have been appropriated by constructions. Parts of the university and residential housing are situated here. The park does not have any clear entrances and the paths and stairs are in bad shape today and need to be rebuilt.

Analysis

The park is a vast green lung in between two densely built districts. It is important from an ecological perspective due to it being a wedge connecting the green space in the city with the surrounding landscape. It is also historically important as an example of a typical large-scale Soviet styled park with an artificial lake and vast forest areas. The park is a complement to the inner yards offering people the chance to use bigger areas for exercising and enjoying nature.

We have identified two park characters in this park, the forest character and the peaceful character. The forest character can be found in almost the entire park. These areas are hilly and homogenous with dense vegetation, providing people with the opportunity to exercise. The area around the lake has more of the peaceful character with an historic and cultural environment represented by the lake and the more arranged surrounding. It is a pastoral place with views over the lake and the surrounding vegetation. However, the character is disturbed by the fact that parts of the structure, paths and stairs, are falling apart. Also, the pastoral feeling decrease as the built environment comes closer, appropriating the park. In comparison to Valea Trandafirilor, the park contains few park characters and offers few kinds of activities which also reflect on the number of people using it. On one hand, it is important to have places in a city where people can be alone and undisturbed, on the other hand the undisturbed forest character could be combined with other characters without losing its soul.

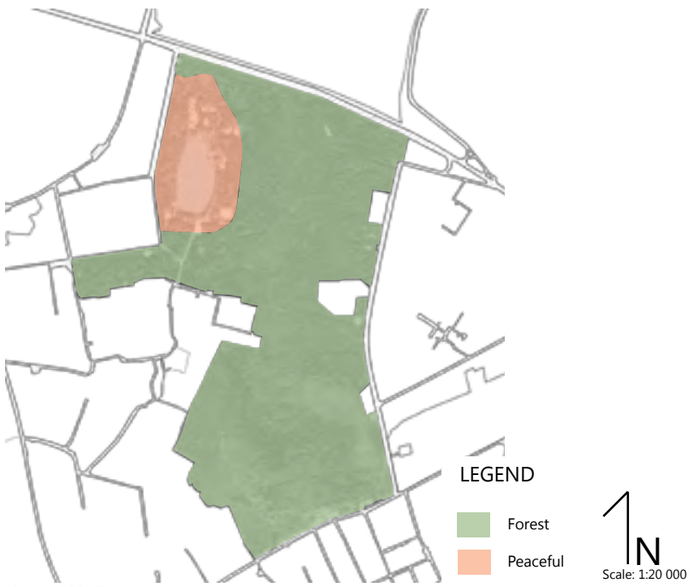


Figure 132: The plan shows present park characters from analysis based on Patrik Grahns research. Made by: Karin Winroth.

Figure 133: Artificial lake
Photo by: Johanna Hagberg

Figure 134: Promenade along the lake
Photo by: Karin Winroth

Figure 135: Grand stair leading to the central part
Photo by: Karin Winroth

Figure 136: Dense forest area
Photo by: Johanna Hagberg

LA IZVOR PARK

Inventory

Parcul La Izvor (Park at the spring) covers an area over 160 hectares and was constructed in 1972. It is situated at the north-western entrance to the city along the street Calea Ieşilor and contains four artificial lakes, of which three are connected by canals. Acacia, maple, birch and poplar are the most common tree species here surrounded by open grasslands. The main path going through the park leads over a bridge with a view of "The Island's Story", which was made as a recreational area for children (AllMoldova 2012). Along the western lake there is a beach, an outdoor gym, a playground, and at the main entrance there is a boulevard cutting through the park from which you get great views of the lakes and islands. The lakes can also be explored with canoes or rowing boats. The east and northern part of the park consists of grasslands with trees and shrubs where cattle graze and people walk. Parts of this area are also used for allotments and cultivation. The River Bîc floats along the north side of the park but the river and park are not integrated. Within the park is also a minigolf course and a newly constructed wooden church. On the opposite side of the park on Calea Ieşilor street is the residential area of Buiucani and in the east the park borders a large industrial area.

Figure 137: Artificial lake
Photo by: Johanna Hagberg

Figure 138: Beach along artificial lake
Photo by: Karin Winroth

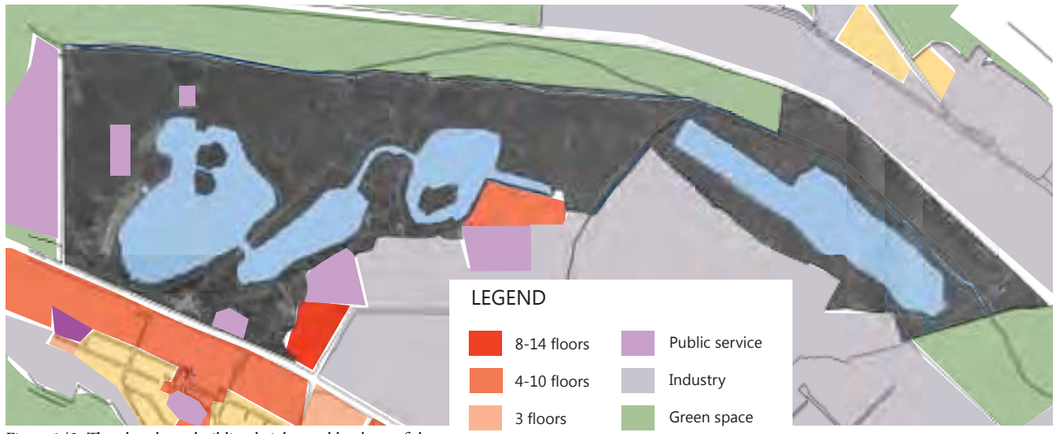


Figure 142: The plan shows building heights and land use of the area surrounding the park. Made by: Johanna Hagberg. Modified from: E-Urbanism, 2012.

Figure 139: Man herding cows
Photo by: Johanna Hagberg

Figure 140: Miniature golf
Photo by: Google maps

Analysis

The lakes and landscape are dominating features and give the park a decorative character with wonderful vistas. The area close to the beach is very play friendly with the playgrounds, outdoor gym and kayaks and boats which invites to different activities while the east part of the park is a mix of wild and peaceful where high grass and trees dominate the picture. In the northwest end there is a species rich character along the River Bîc. Unfortunately, the river is not integrated with the park area, floating unnoticed along the park towards the city centre. The areas around the lakes have a higher level of maintenance than the parts along the river and in the east part. The allotments give the feeling of the visitor not being welcome even if they are situated in the public space and along the river, the park appears to be abandoned, which makes the visitor feel unsafe while walking there. Integrating the river and increasing maintenance to add more diversity and functions are a great potential development for this park.

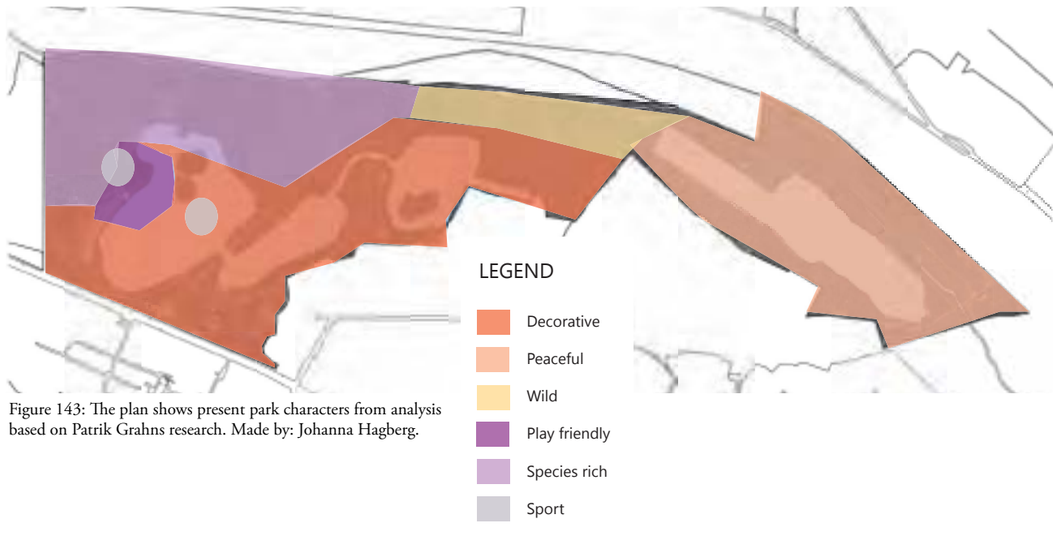


Figure 143: The plan shows present park characters from analysis based on Patrik Grahns research. Made by: Johanna Hagberg.

Figure 141: Home made bridge over River Bîc
Photo by: Johanna Hagberg

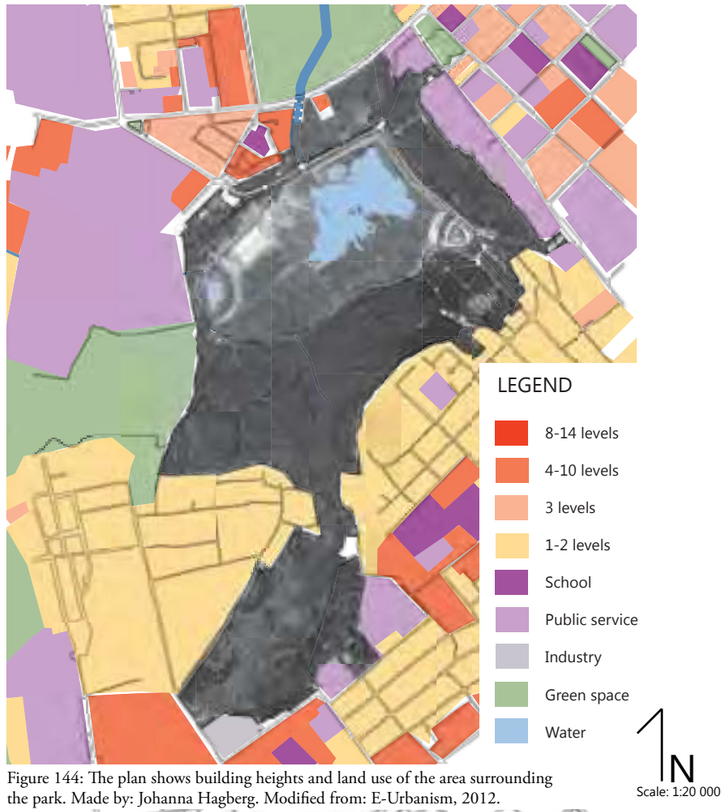


Figure 144: The plan shows building heights and land use of the area surrounding the park. Made by: Johanna Hagberg. Modified from: E-Urbanism, 2012.

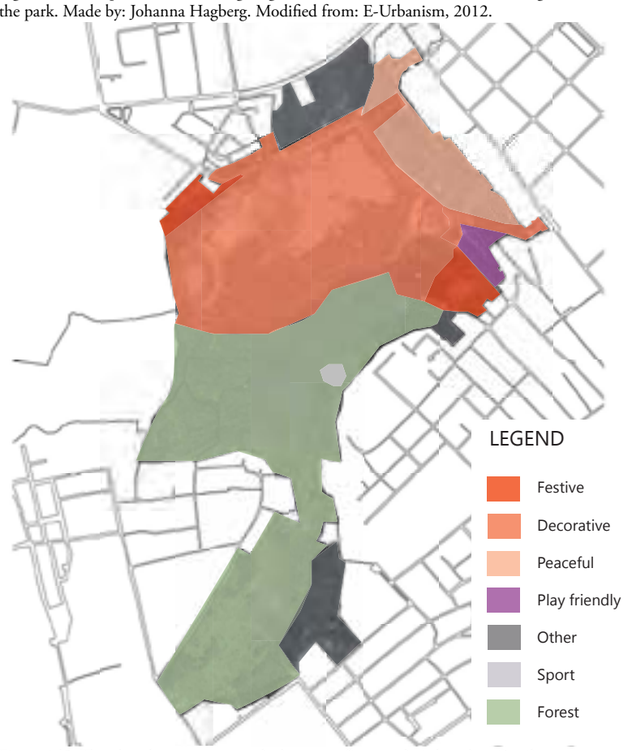


Figure 145: The plan shows present park characters from analysis based on Patrik Grahns research. Made by: Johanna Hagberg.

Inventory

Parcul Valea Morilor (The Valley of the Mills) is a big park of 114 hectares, connected with wilder forest areas and former cultivated lands at the edge of the city. The park was constructed in the Soviet period and an artificial lake of 34 hectares was made in the middle of the park. In 2008, the lake was emptied because of bad water conditions and the reconstruction of the lake is still on-going (AllMoldova, 2012). According to [1]Vladimir Us the lake will be rebuilt mostly by money from private investors. Lacul Morlior is situated 50 meters lower than the grid-net city and the southern part of the park rises very quickly to 165 meters above sea level (Larsson, Skoog, 2009, p. 20). Also in the northern part there is an incline and the main entrance is connected to the park via a long staircase.

The park is very popular among the people in Chisinau. Even without a lake it provides many activities, such as volleyball and badminton playing, running, biking, strolling and resting. Within the park, in the southeast corner, there is a summer theatre, Teatrul Verde. Connected to the park there is an amusement park, Aventura Park, as well as the largest exhibition complex in Moldova, MoldExpo. The park also contains an art centre, playgrounds and outdoor gyms. In the tree slope in the south of the park an outdoor gym and shower is constructed by people using the park. It is one of the few parks in Chisinau that is taken care of by people using it and not by the government according to [1]Us. However, parts of the park need refurbishment and better maintenance for it to reach its glory days as the people's park.

Analysis

This park is often called "the people's park" due to the fact that it is taken care of by the people using it. It contains many characters and therefore attracts a lot of different kind of people. The entrance staircase is magnificent and gives a good exercise to the visitor. The lake, which is being restored at the moment, provides a large open space where the eyes can rest. In the southern, inclination there is a forest character even though it is visible that the trees are planted in some areas and it in large parts misses a natural middle layer with shrubs.

The area around the lake has decorative character while the adventure park and summer theatre gives a festive atmosphere during events. Close to the main entrance is the playground and the area around it is play friendly, while the area to the right from the entrance has a decorative character and a peaceful atmosphere.

Figure 146: Reconstructed artificial lake
Photo by: Johanna Hagberg

Figure 147: Playground
Photo by: Johanna Hagberg

Figure 148: Outdoor gym constructed by local residents. Photo by: Johanna Hagberg

Figure 149: Stair and gazebo
Photo by: Johanna Hagberg

Figure 150: Lighting at night
Photo by: Johanna Hagberg

Figure 151: Straight angles in forest area
Photo by: Johanna Hagberg

[1]Vladimir Us, Oberliht, meeting, 15 November 2011.

RÎŞCANI FOREST-PARK

Figure 152: Artificial lake
Photo by: Johanna Hagberg

Figure 153: Main path
Photo by: Johanna Hagberg

Figure 154: Terraced forest area
Photo by: Johanna Hagberg

Figure 155: Dense forest area
Photo by: Johanna Hagberg

Figure 156: Old outdoor gym
Photo by: Johanna Hagberg

Figure 157: Planted forest
Photo by: Johanna Hagberg

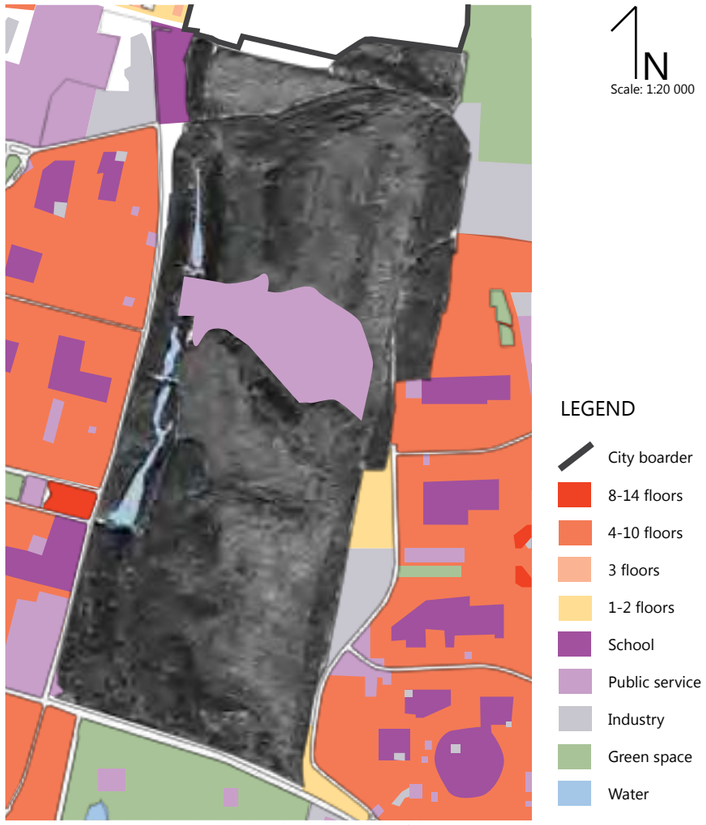


Figure 158: The plan shows building heights and land use of the area surrounding the park.
Made by: Karin Winroth. Modified from: E-Urbanism, 2012.

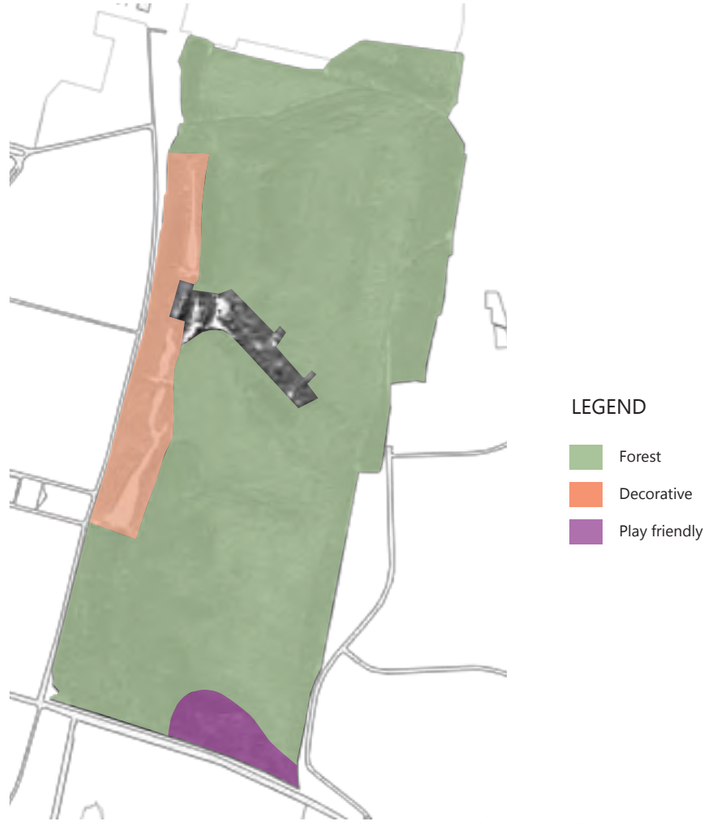


Figure 159: The plan shows present park characters from analysis based on Patrik Grahns research.
Made by: Karin Winroth.

Inventory

The Rîşcani forest-park is located in the north-eastern part of Chişinău and was constructed in 1970 together with Rîşcani park in the south (Allmoldova 2012). It is a huge forest area planted in a terraced slope between Rîşcani and Ciocana district. The forest-park is a wedge going from Rîşcani park in the south to the city border in the north. High-rise buildings surround it on the western and eastern side. In the forest-park there are three artificial lakes connected with canals. The sides of the lake are reinforced with concrete and along them there are asphalt paths.

When we visited the park we did not meet many people but the ones we saw either sat on a bench next to the lakes, or walked their dogs. Except for the lake and an area for public service in the middle, the whole area is covered by planted trees. If it were not for the trees standing in rows it would look like a natural forest. Smaller paths lead up the slopes and along the terraces. Here we met a person jogging. In the south-east of the park-forest on a height a little place is kept open. From this place one has a vista over the city and Rîşcani park in the south. Also, here there is an old outdoor gym. The only formal entrance is situated on the west side next to the lakes, and to enter the park-forest from other directions you have to search for some of the smaller paths.

Analysis

Similar to Rîşcani park Rîşcani forest-park mostly contains areas with the forest character. They are homogenous with a varied topography and dense vegetation. The forest makes you feel like you have entered nature but the terraces also add a cultural layer on top of the natural feeling, which bolsters the experience. On the paths along the forest you are led onwards to see what is coming next. Meanwhile, the peaceful character, which can be found along the artificial lakes, makes you want to sit down and observe the water and people passing by. The lakes become a focal point which slows the movement down.

In the south, at the viewpoint, we have identified the play friendly character. It is a calm open place surrounded by forest, with many opportunities for a creative child to play in. Except for the old exercise equipment, small junipers are superb to climb in or hide behind. However, the road is rather close to this place meaning that the traffic noise could become disturbing. Also, there are no flowers or water for children to use in this place. As in Rîşcani park, this forest-park has the potential to accommodate more park characters and activities than today without losing the forest character. More varied functions and cultural expressions could find their way here based on what people living in the surrounding areas want and need.

CALEA ORHEIULUI FOREST-PARK

Figure 160: The plan shows building heights and land use of the area surrounding the park. Made by: Johanna Hagberg. Modified from: E-Urbanism, 2012.

Inventory

Parcul Calea Orheiului is a forest park situated west of the Rîşcani district. The green area stretches for 2,5 kilometers from south to north, is about 500 m wide and has a longitudinal slope, highest on the east side. A street with the same name, Calea Orheiului, runs along the west side of the park. On the other side of the street there is a neighbourhood called Posta Veche (Old Post) with 1-3 level buildings from the 50s and 4-10 level ones built during the last 30 years. On the other side is the Strada Florilor (Street of flowers) and Riscani with mainly 4-10 level buildings. The whole area was developed according to the Soviet plan from 1971. The northern part of the park is separated from the rest by Strada Studentilor and in the south the park ends at Strada Tudor Vladimirescu.

The park contains a football stadium, tennis courts, stables, an outdoor gym, and is popular for jogging. There are residential houses appearing in the park but also other types of buildings, for example in the southeast corner where Apa-Canal has its sectorial office next to a printing plant. The park is used by people living nearby for grazing cattle.

Figure 161:The plan shows present park characters from analysis based on Patrik Grahns research. Made by: Johanna Hagberg.

Analysis

This forest-park contains small parts of many different characters. The peaceful and forest characters are dominating even if the peaceful parts lack the tidiness and high maintenance that actually are required to be organ-ised under this character. In the middle of the park, around the stables, is a more robust area that are play friendly. The sport field and outdoor gym gives, off course, the sport character, but the forest character contains both play friendly and sport character because of robustness and the fact that they are popular for jogging. The maintenance is barely noticed in the park, except around the sport field, which contributes to the wild character in some places. These wild places do not generate a good feeling due to the amount of trash and wild dogs, which make the visitor feel uneasy. This forest-park has good potential for further development and if the level of maintenance increase.

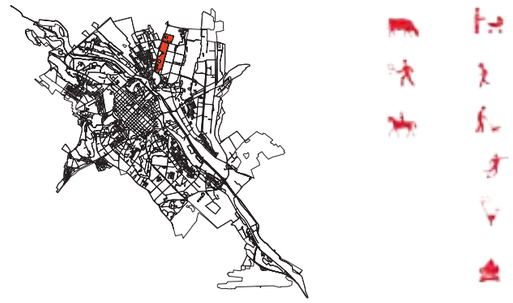



Figure: 162


Figure: 163


Figure: 164


Figure: 165


Figure: 166


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Figure: 168

Figure 162: Barbeque in the park
Figure 163: Eastern edge
Figure 164: Informal paths throught the forest
Figure 165: Riding school
Figure 166: Sports stadium
Figure 167: Outdoor gym.
Figure 168: Woman herding cows
Photos by: Johanna Hagberg.

BbotanicĂ garden

Figure 169: Decorative entrance

Figure 170: Plants imitating instruments

Figure 171: Cut bushes and trees

Figure 172: Unaccesible cultivation

Figure 173: Forest area

Figure 174: Artificial lake giving a nice view

Inventory

The Botanică garden is a branch of the USSR Academy of Sciences and has the status of a scientific research institution situated next to the south entrance of Chişinău. It was founded in 1950 and is 104 hectares in size. In the garden there are about 10 000 species of native and exotic plants shown for an entrance fee (Grădina Botanică). According to 11Valeriu Istrati the garden is not as well maintained today compared to Soviet times, due to less funding from the government and the changed purpose of the garden. Nowadays it focuses more on business and less on science. Still, it is a popular destination for people in Chişinău, especially the residents of the Botanică district. People come here to relax and get inspired, or to take their wedding photos. In the middle of the garden lies four artificial lakes connected with water cascades. Along the lakes and next to the two entrances much effort is put into decorations and maintenance. Further south denser stands of trees are planted and here the greenhouses are situated. South of the tree-covered area lie plants for cultivation which are not accessible to the public. Due to the location of the Botanică garden in the outskirts of the city, it is not as crowded during weekdays as the more centrally located parks.

Analysis

The Botanică garden is a valuable compliment to the green space maintained by the municipality. The northern part has the species rich character with a variety of flora and fauna, creating an interesting experience which triggers many senses. The only green spaces in Chişinău offering the species rich character is the Botanică garden and Dendrariu park, which is what makes these places so valuable. They could become inspiring examples for the development of other parks and public gardens in the city. Some parts of the species rich area also have the decorative character with flower beds, water cascades and cultural symbolism in the way the plant material is arranged. However, they are not meeting places or square-like as Patrik Grahn (1991, p. 1) defines the decorative character. The tree stands have the forest character, even if they are also species rich, since they are dense and rather homogenous.

Figure 175: Park room decorated with rocks

[1]Valeriu Istrati, Hai Moldova!, meeting, 23 November 2011.

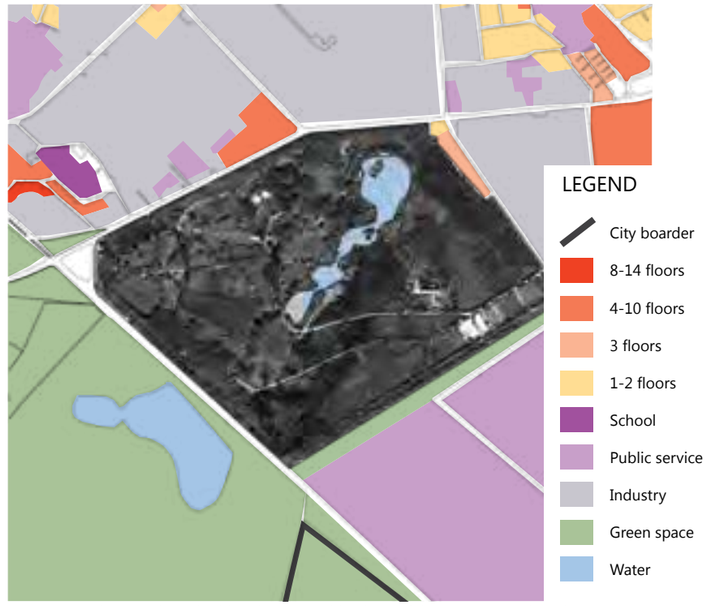

Figure 176: The plan shows building heights and land use of the area surrounding the park.
Made by: Karin Winroth. Modified from: E-Urbanism, 2012.

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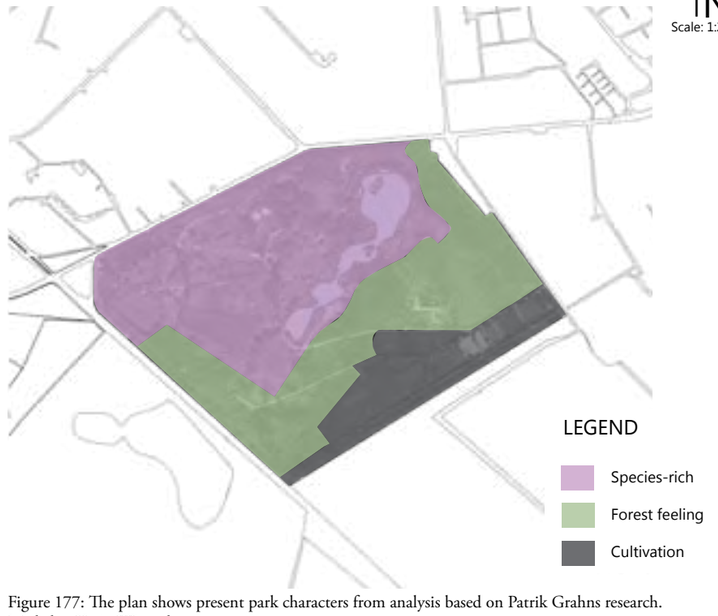


Figure 177: The plan shows present park characters from analysis based on Patrik Grahns research.
Made by: Karin Winroth.

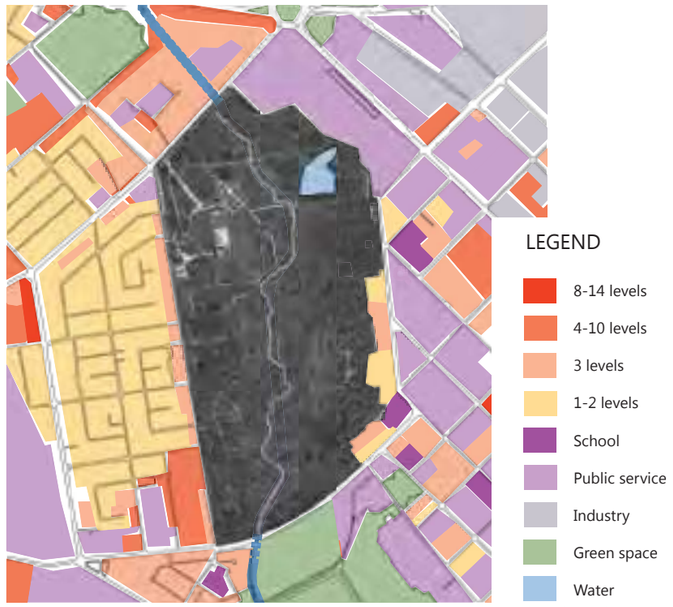


Figure 178: The plan shows building heights and land use of the area surrounding the park. Made by: Johanna Hagberg. Modified from: E-Urbanism, 2012.

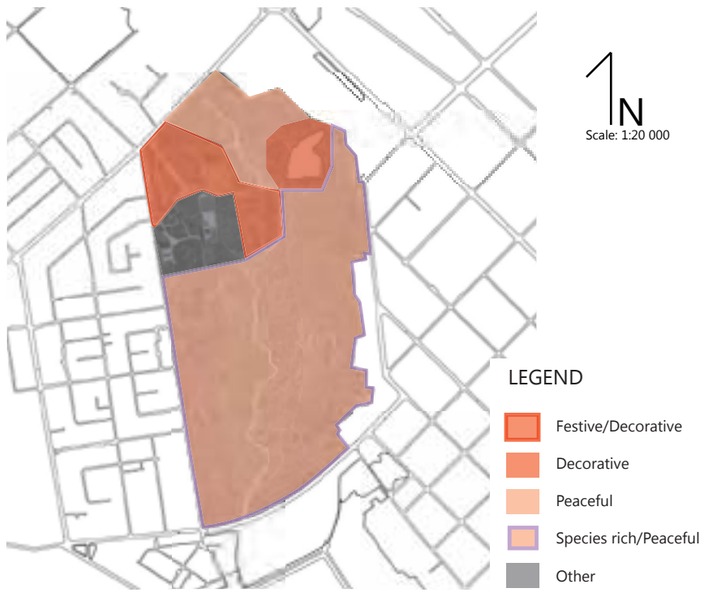


Figure 179:The plan shows present park characters from analysis based on Patrik Grahns research. Made by: Johanna Hagberg.

Inventory

Dendrariu Park is situated northwest of the historical center. It was the first Botanical Garden in Chişinău. Today the park is owned by a municipal enterprise which cultivates and sells plants combined with botanic investigations according to [11]Valeriu Istrati. The park is fenced with only one entrance in the northwest corner where the visitor pays a small entrance fee. Many newlyweds come here to take their wedding photos, and people go here to stroll around and enjoy the landscape. Most of the park is relatively flat but at the east and south side there are steep upward incline planted with trees. A large university campus is situated in the northeastern corner of the park. The west side is adjacent to an area with villas and in the south the slope and Strada Vasile Lupu defines the border, though on the other side is another popular park, Valea Morilor. There is unfortunately no connection between the two parks except, for a small tributary stream to River Bîc flowing from the lake in Valea Morilor under the street and through the whole of Dendrariu park. This is one of the most maintained parks in the city and it is very popular to visit during the weekends.

Analysis

The peaceful character is dominant in the Dendrarium Park, this is because of the high level of maintenance and the variety of plants and open grass fields. The history of being the botanical garden is visual and it contains many different species which also give the species rich character, even if it is not allowed to pick or collect any flowers here. At the entrance is a decorative and festive character with the flowerbeds, people strolling and taking wedding pictures. The decorative character can also be found around the lake which is very picturesque.

Figure 180-181: Edge and interior of peaceful forest area. Photos by: Karin Winroth

Figure 182: Gazebo. Photo by: Karin Winroth

Figure 183: Entrance. Photo by: Johanna Hagberg

Figure 184-185: Artificial lake seen from the tree-covered and the open surrounding. Photo by: Karin Winroth

Figure 186: Decorative plantation with fountain. Photo by: Karin Winroth

Figure 187: Small river. Photo by: Karin Winroth

[11]Valeriu Istrati, Hai Moldova!, meeting, 23 November 2011.

ADDITIONAL INVENTORIES AND ANALYSIS

MIRCEŞTI PARK, PETRICANI, PRUNCUL, BUIUCANI & LUNCA GÂŞTEI FOREST-PARK

These areas are tree covered and fractioned between built development. Due to the size and location they are important links to the surrounding forest areas, and as recreational areas within development. They create an opportunity for a wilder character containing parts with more varied functions and park characters for residents.

Figure 188: Lunca Gâştei forest-park. Photo by: Google maps

MIHAI EMINESCU PARK

This a green wedge going through residential areas. It is over-grown with dense vegetation and small paths. Trees planted in row reveal it being planned as a forest-park once, but during our inventory we did not see anybody, except for stray dogs. If it was maintained and opened up in some parts it would be a useful green area in this densely populated part of the city.

Figure 189: Wild character in the overgrown park.
Photo by: Karin Wnroth

OPEN GREEN SPACE

Today, it is an open green space containing an artificial lake and an ice-skating rink. It is situated between high-trafficked roads and new high-rise residential buildings, and is rarely maintained. Due to the lack of green space in the city centre, it has the potential of becoming a park for people living in the area and connected with River Bîc.

Figure 190: Open grassland surrounds the artificial lake.
Photo by: Karin Wnroth

SCHINOASA FOREST-PARK

Next to Valea Morilor lies this partly open forest area on hills providing view of the surrounding landscape. It is used for recreation by people living close by and people coming to Valea Morilor. Some people has allotments here. This space could be described as a wild forest with traces of culture in the terraced slopes with fruit trees. It is valuable as a link between Valea Morilor and the surrounding landscape and is already of high quality with varied vegetation. Its potential would increase if it was better accessed and connected with its surrounding.

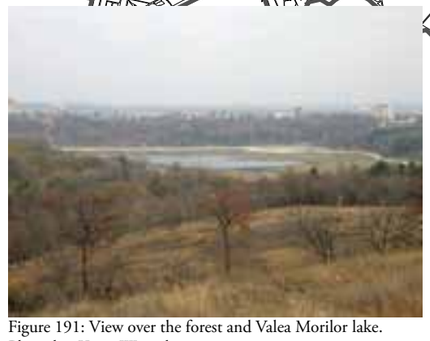


Figure 191: View over the forest and Valea Morilor lake.
Photo by: Karin Wnroth

GREEN SPACE NEXT TO THE CIRCUS

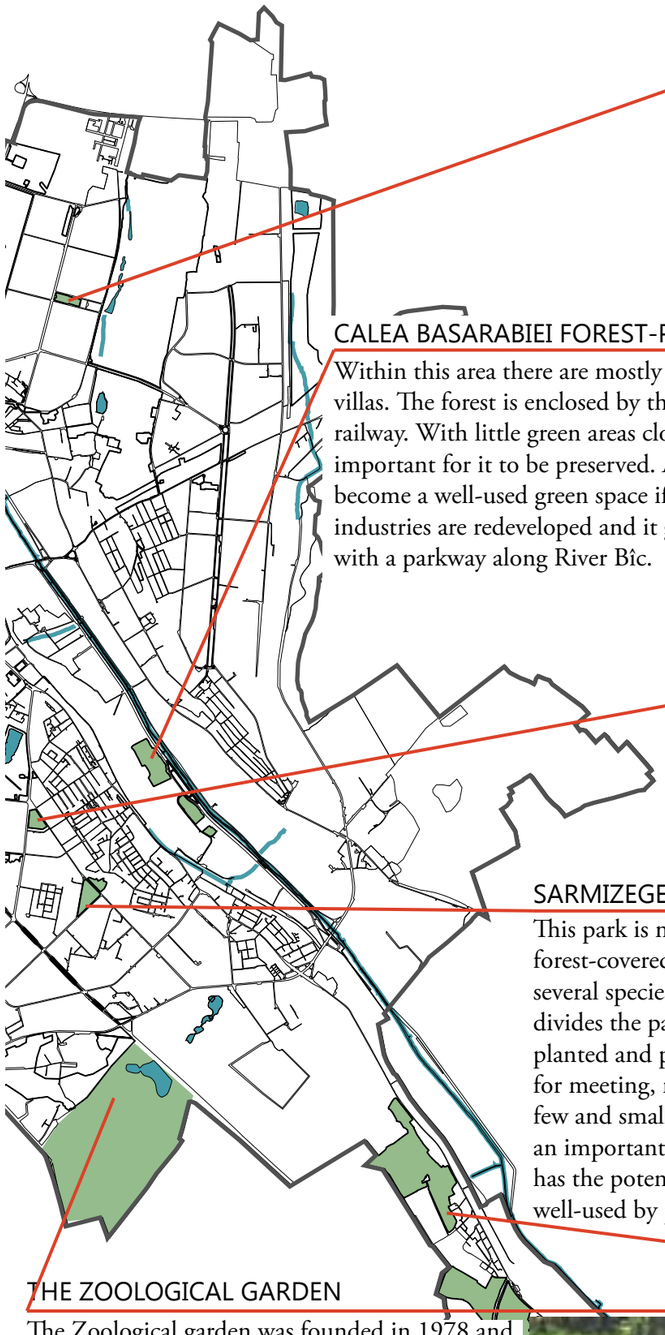
This area is situated next to the old circus and is surrounded by high-trafficked roads. It is not maintained and party exploited by villas and industries. It has no park character today, but due to its central location it has great potentials to become a new public park for residents in the area and to unburden the central parks. There is a lack of public places with activities for young people and this green space, together with the circus, could fill that need.

Figure 192: Abandoned park area treated as wasteland.
Photo by: Karin Wnroth

VICTORY MEMORIAL PARK "ETERNITATE"

This is a memorial park for the Soviet soldiers who died during the Second World War when Moldova was liberated. There are smaller monuments along the sides and a bigger monument in the middle with an eternal fire. This is an enclosed park and one feel a little limited using it due to all guards watching the monuments. However, we consider it to be a part of the green structure in Chişinău as it still provides an opportunity to stroll around and rest. Also, the park is very well-maintained and has varied vegetation and spatiality.

Figure 193: The park area surrounding the eternal fire.
Photo by: Karin Wnroth



MEMORIAL PARK "FECIORILOR PATRIERI-SFÎNTA AMINTIRE"

In the middle of the park stands a memorial of when the Soviet troops withdrew their forces from the war i Afghanistan in 1989. Nearly 12 500 Moldovan citizens tool part in this war. The park has a playground and is besides used for play, enjoyed for strolling, resting and meeting people from the neighbourhood. Next to the park stands a modern new building. Compared to the vast green spaces in this area, this park creates variation due to its small size.

Figure 194: View towards a new modern building next to the park. Photo by: Karin Wnroth

CALEA BASARABIEI FOREST-PARK

Within this area there are mostly industries and villas. The forest is enclosed by the river and the railway. With little green areas close by it is important for it to be preserved. Also, it could become a well-used green space if the surrounding industries are redeveloped and it gets connected with a parkway along River Bîc.

Figure 195: The forest-park has a wild character. Photo by: Karin Wnroth

SERGEI LAZO PARK

According to the information got we have this small park is not maintained by Spații Verzi. It is well maintained and used as a meeting place by people living in the area. It is tree-covered with many paths, and due to surrounding wide roads it feels like an isolated island. It looks like most green space in Chişinău but has the potential of becoming a meeting place with its own identity for the residents in the area.

Figure 196: Old ladies meeting in the park. Photo by: Johanna Hagberg

SARMIZEGETUSA PARK

This park is maintained by Spații Verzi and is a forest-covered park containing a playground and several species of trees and shrubs. A wide road divides the park in two parts. It is a rather densely planted and people living in the area are using it for meeting, rest and walking. In this area there is few and small public green space why this park is an important feature here. As Sergei Lazo park is has the potential of becoming more accessible and well-used by people from other parts of the city.

Figure 197: Sarmizegetusa park in summer. Photo by: Google maps

THE ZOOLOGICAL GARDEN

The Zoological garden was founded in 1978 and is coordinated by Academy of Sciences of Moldova and the Ministry of Environment of the Republic of Moldova (Grădină zoologică). Here you can see different kind of animals, ride horse and enjoy the swan lake. The garden is surrounded by a vast green area with forests and an artificial lake. Unregulated developments have appropriated parts of this area.

Figure 198: Storks in the Zoological garden. Photo by: Google maps

MUNCEŞTI FOREST-PARK

These forest areas are situated next to residential areas and the airport. In one part, close the River Bîc, lies a lake. If the area is exploited further, parts of it should be kept as wilder recreational areas.

Figure 199: Dense planted forest. Photo by: Google maps

WORKSHOP: IMPROVE CHIŞINĂU!

To gather information of what the people living in Chişinău think of the public space in the city we arranged a public workshop. People were invited through social media and were asked to come to the central square and give their opinion. They were told to write about a place they like, a place they do not like and a place with opportunities, and define why they were thinking of these places. The result can be seen on the opposite side. During our interviews we also got some information about the public space. For example [1]Viktoria Tozlovanu, who has studied architecture in Chişinău for 3.5 years, describes the problem of no interaction between generations. She means there is a gap between young and elder people, where younger people in Moldova are getting closer to Europe with new possibilities. Older people growing up in the Soviet era are more aware of the value of green space, recreation and sports. Even so there is a lack of activities and an opportunity for young people to interact in the public sphere, as well as a possibility to interact between generations. A tradition among the elder generation is ladies sitting on the benches talking and the men are playing chess.

[1]Andrusceac Ion is an architect and according to him some green spaces are just for passing through. He also points out the lack of interactions between old and young people in Chişinău.

Two high school students, [1]Otilia and [1]Doina, explained to us that they mostly use the green space for resting, socialising with friends and enjoy the environment. What they miss in the green space of Chişinău is cafés, restaurants, more opportunities for social interaction and for the green space to be accessible and beautiful also in wintertime.

[1]Alexandru Munteanu is an urban designer and mentions the stray dogs in many green spaces of Chişinău as a big problem. People are afraid of the dogs. There is a dog hotel for homeless dogs but they can not take care of as many dogs as is needed to solve the problem.

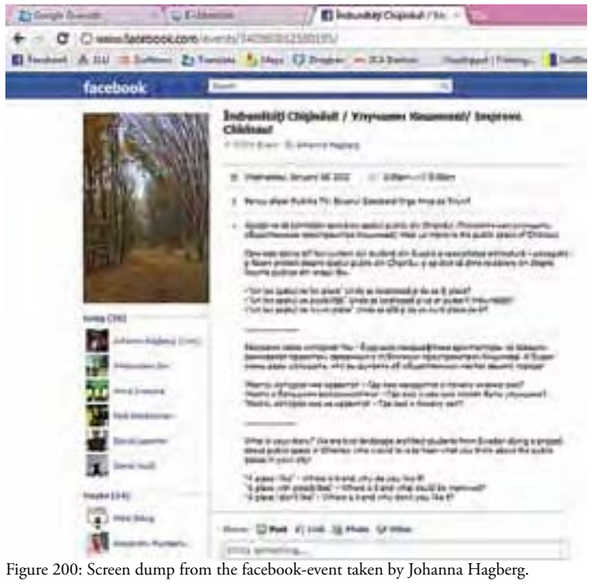


Figure 200: Screen dump from the facebook-event taken by Johanna Hagberg.

Figure 201: Workshop in action.
Photo by: Johanna Hagberg

I would say that I don't really like not a specific place but certain things such as lack of information about key spots for green tourism in the city, plenty of parks being dirty. Yeah, that all I would say.

Cities are very dirty, but actually we also have smth (meant smth to be proud of)

The green areas of Chisinau is a landscape treasure; no matter if it is Dendrarium park, The botanic garden or the Codrii preserve.

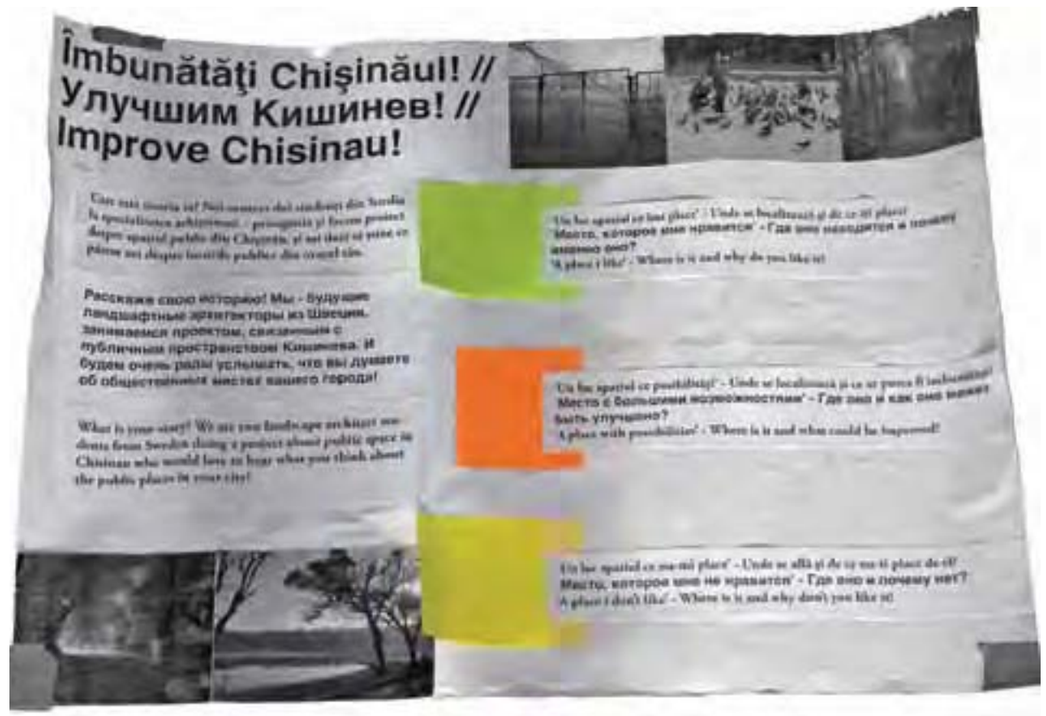
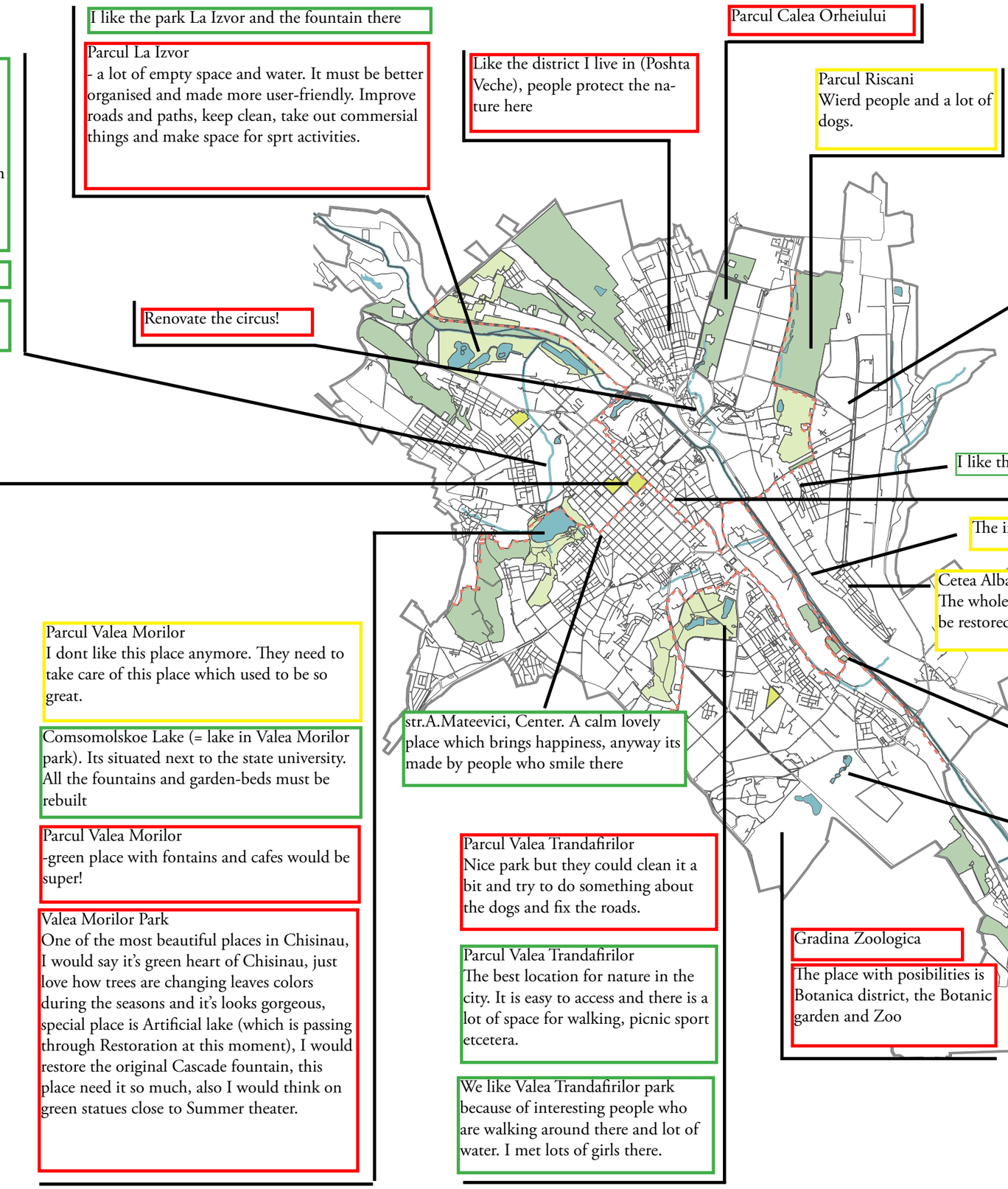


Figure 202: Explanatory sheet for the workshop.
Photo by: Johanna Hagberg

[1]Vladimir Us, Inga G., Viktoria Tozlovanu, Andrusceac Ion, Doina Tonala, Otilia Bărbuţă, Oberliht, Alexandru Munteanu, meeting, 15 November 2011.



Dendrariu in Chisinau
A lovely green place, well sustained, clean and has a lot of attractions such as a lake, an artificial fountain, flowers exhibition etc. Perfect for romantic date, family promenades, hang out with friends or just fun on rollers, skates or bikes.

I like the Dendrarium park

Le Dendrarium
It is well maintained and preserved.

I like the park La Izvor and the fountain there

Parcul La Izvor
- a lot of empty space and water. It must be better organised and made more user-friendly. Improve roads and paths, keep clean, take out commersial things and make space for sprt activities.

Like the district I live in (Poshta Veche), people protect the nature here

Parcul Calea Orheiului

Parcul Riscani
Wierd people and a lot of dogs.

Dont like Ciocana district because of the crimes and dirt

Ciocana district
A new area but with a lousy plan. The industrial place is unused.

Renovate the circus!

Piata Centrala must be totally renewed. It is noicy, not clean, no happpy people, crowded, a spot for criminality and cheating

Piata Centrala is very crowded and dirty.

I like this area a lot.

The space in front of the government is not used properly.

The industrial zone, is very chaotic

The central part
Expoces our rich history, is decorated for different events and it is green.

Cetea Alba
The whole area needs to be restored.

The river would be nice with some less trach and some paths and less pollution and some folks and a few less dogs!

I like the centre of the city very much, the Arch or the Cathedral, because of the activities

River Bic has ties to the historical core of the city. Needs to be cleaned, both river and the area around it. Historical reconstructions maybe and make it popular!

St.cel Mare str., an unique street which is well developed,

Parcul Valea Morilor
I dont like this place anymore. They need to take care of this place which used to be so great.

str.A.Mateevici, Center. A calm lovely place which brings happiness, anyway its made by people who smile there

Comsomolskoe Lake (= lake in Valea Morilor park). Its situated next to the state university. All the fountains and garden-beds must be rebuilt

Parcul Valea Morilor
-green place with fontains and cafes would be super!

Valea Morilor Park
One of the most beautiful places in Chisinau, I would say it's green heart of Chisinau, just love how trees are changing leaves colors during the seasons and it's looks gorgeous, special place is Artificial lake (which is passing through Restoration at this moment), I would restore the original Cascade fountain, this place need it so much, also I would think on green statues close to Summer theater.

Parcul Valea Trandafirilor
Nice park but they could clean it a bit and try to do something about the dogs and fix the roads.

Parcul Valea Trandafirilor
The best location for nature in the city. It is easy to access and there is a lot of space for walking, picnic sport etcetera.

We like Valea Trandafirilor park because of interesting people who are walking around there and lot of water. I met lots of girls there.

Gradina Botanica

The botanical garden
It is well maintained and preserved.

Gradina Zoologica

The place with posibilities is Botanica district, the Botanic garden and Zoo

The botanical garden
The most calm and beautiful place ecepially during spring and summer when it looks awesome.

RIVER BÎC

In this chapter River Bîc will be introduced more closely, with a landuse inventory, description of environmental conditions, the current future plans, as well as a Lynch-analysis. As a conclusion a SWOT-analysis will summarize what we take with us for the proposal.

INVENTORY RIVER BÎC AND ITS SURROUNDINGS

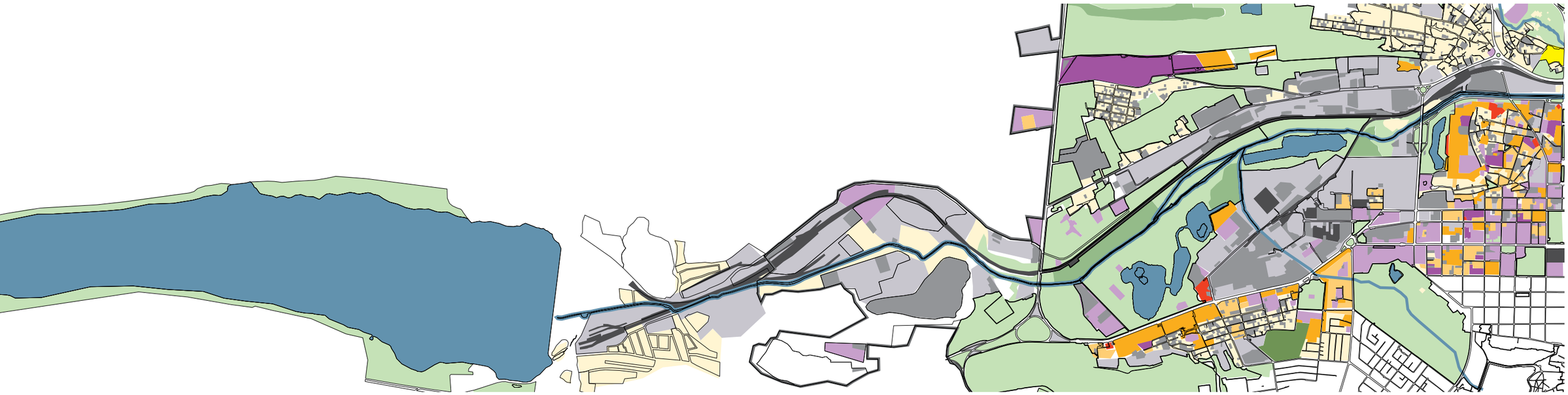


Figure 203: The plan shows building heights and land use of the area surrounding the park. Made by: Karin Winroth. Modified from: E-Urbanism, 2012.

The River Bîc stretches over 155 km through the country. The source is a spring located northwest of the city in the Codrii Preserve. River Bîc has nine tributary flows from smaller rivers and the river basin has a total catchment area of 2020 km2 (National Bureau of Statistics of the Republic of Moldova 2010). The river goes through Chişinău over 19,5 kilometres, from the northwest to the southeast, and further down it intersects with the Dneistr River. When the river enters the municipality of Chisinau there is a dam, built in 1962 for flood prevention (Postolachi & Vlădicescu 2010, pp. 9-10, 22-23). The dam is called Ghidighici lake and is today a 7 kilometers long water reservoir that has been transformed to a recreational area. Along the shore is a green park of 124 ha with the same name as the reservoir. The park consists of a beach area, an indoor water area, and a boat station. Common activities are fishing, swimming, windsurfing, walking, jogging, and biking, and it is a popular destination in summer time for people in Chişinău (All-Moldova 2012).

From Ghidighici lake the river flows through an industrial area before it reaches the city border. It then connects to Parcul La Izvor before it passes through the central parts of the city, where it has been canalised. During the 1970s River Bîc was rectified and reinforced. 8,3 kilometres of the meanderings were straightened out, reducing the length by 1,3 kilometres (Postolachi & Vlădicescu 2010, pp. 9-10, 22-23). In the central parts of the city a heavi-

Figure 204: Reed taking over the river.

Figure 205: Strada Albisoara runs along the river.

Figure 206: Slopes along the river.

Figure 207: High speed roads passes the river.

Figure 208: The plan shows building heights and land use of the area surrounding the park.
Made by: Johanna Hagberg. Modified from: E-Urbanism, 2012.

ly trafficked road, Strada Albisoara, runs along the southwest side of the river. In this area there are some residential buildings. The railway run along the river at the northeast side but after Strada Puskin they intersect so that the railway comes between the river and the central core. After the intersection the river flows between the railway and another trafficked road, Calea Mosilor until it crosses Strada Ismail. In this part the river runs between Strada Varnita and Calea Basarabiei through the industrial area. This is a popular place to come and wash your car since the road is so close to the river. The river runs along the two roads until it passes Botanica. Here the wastewater treatment plant of Chisinau is located, which gives a characteristic smell to the area. The cleaned water from the plant is let in to the river. Right after the plant the river flows outside of the city border for a short distance before the border and the river runs parallel for a while before continuing its journey to the River Dniester.

There are a few bridges crossing the river but they are built for car traffic. There are many places where people have placed home-made pedestrian bridges for crossing the river where it is convenient to do so. The river basin goes through two geomorphological areas; forest and the Prenistrean plateau. Because of the hilly topography most of the water from the river comes from rain water runoff. During periods of low water levels in the river the average depth is 25-30 cm. During summers the river is dry and in winter time it freezes (Postolachi & Vlădicescu 2010, pp. 9-10, 22-23).

Figure 209: Home-made bridge over the river in the north.

Figure 210: Pedestrian bridge constructed on pipes.

Figure 211: View towards southwest.

Figure 212: View towards industries in the northeast.

Figure 213: Gas-pipes crossing the river.

Photos by: Karin Winroth

The river is polluted

The environmental issue of highest priority and greatest concern, for the citizens of Chisinau and for people living close to the river, is the condition of Bîc River Basin (Postolachi & Vlădicescu 2010, p. 32). The major pollutants come from surface runoff and waste, the coating of damaged roads and soils, air emissions from industrial enterprises and exhaust heating systems. Rain water and microbial contamination also contribute to the pollution of the river, as a result of inadequate sewage treatment networks in the city.

The water quality in River Bîc upstream from Chişinău is satisfactory, but downstream, in the southern end of the city, the water quality is bad and worsening as it permanently receives more wastewater. The biggest problems are the levels of ammonium ions and dissolved oxygen. Further, industrial and agricultural activities contaminate the surface water with chlorides, nitrates, pesticides and heavy metals which spread into the groundwater in and around Chişinău. It is common for businesses to dump their waste directly into the drainage network or on the ground, polluting the surface water.

Besides pollution from wastewater entering the river, soil erosion also pollutes the aquatic environment by carrying a large amount of fluoride and nitrogen compounds. The evacuation of biogenic substances contributes to over-fertilization, which endangers the water quality via increased amounts of phosphorus, which supports pathogenic micro flora (Postolachi & Vlădicescu 2010, pp. 22-23). As if this is not enough, water from the river is used for car washing in the city and then thrown back in the river again without being cleaned. According to [8]Ina Coseru wastewater from car washes, for example, has to be directed through sewage systems and not directly enter the River Bîc as it does today. If this is done, more simple cleaning systems could take care of storm water before entering the river. [8]Coseru further explains that heavily polluted water from River Bîc is used for irrigation in an area southeast of Chişinău called Anenii Noi. Some of the crops from these agricultural lands are later sold in the area around Chişinău.

Problems with Floodings

Acvaproiect is a Water Management projecting Institute in the Republic of Moldova. According to the Chief Engineer at Acvaproiect, [7]Pavel Mîndrilă, the risk of flooding is highest in spring when it rains and the snow melts. The central parts of Chişinău are the most vulnerable to flooding because here the river is narrowest and it is surrounded by industrial plants which

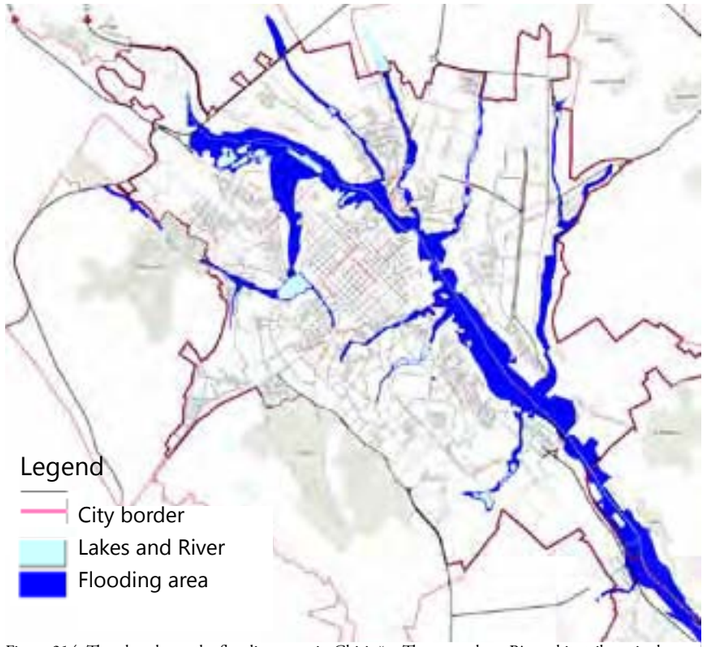


Figure 214: The plan shows the flooding areas in Chişinău. The areas along Bîc and its tributaries has the biggest risk of floodings, including big parts of the historic city centre. Source: IHS Romania SR 2007, 2011-12-14.

cause clusters of waste to clog the channel and slow the water flow. Another negative effect from flooding is that when the rain water washes off petrol products, oil, sediments and heavy metals etc. from the land surface, it blocks the drainage system and pollutes the water and green areas. Flooding also destroys buildings, makes them more vulnerable to earthquakes and also increases the spread of infections from standing water.

Today's drainage system is not designed to cope with the floods that occur approximately once every 100 years, as regulations in force demand. The area at risk in Chişinău constitutes 1540,5 hectares, including 858.4 hectares of the Bîc River Basin. Most rainwater channels and collectors have their output into River Bîc and are built to handle the maximum water flow which occurs once per two years. Only the newer parts of the drainage system are

Figure 215: Car-washes polluting the river. Photo by: Johanna Hagberg

Figure 216: People are dumping their waste in the river. Photo by: Karin Winroth

built to handle the maximum water flow once per 50 years. The technical conditions of the drainage system and water collectors are inadequate and it does not clean the water from deposits and garbage. River Bîc and other small rivers receive the outcome of all water collectors. Due to an increase of mud in River Bîc the water speed has decreased which has led to the filling up of water drainage exits. Another problem is the layer of silt from 0,5 to 1,0 meters in the river, and the growth of reeds, in which litter gets stuck (Postolachi & Vlădicescu 2010, p. 4-5, 34).

[7]Mîndrilă tells us the Ghidighici dam was built as a retention pond to stop large amounts of water from entering the city. However, the dam does not fulfil its intended function today and could let through up to 260 m3 of water in periods of increased water flow every 50 to 70 years.

[8]Ina Coseru, Head of National Environment Centre, meeting, 22 November 2011.

[7]Pavel Mîndrilă, Deputy Technical Director Acvaproiect, meeting, 29 November 2011.

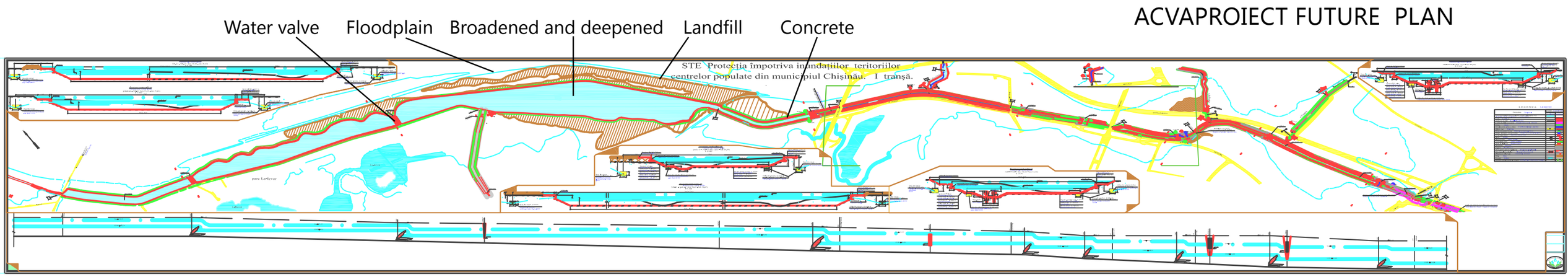


Figure 217: Acvaproiects proposal for a revitalization of river Bîc includes cleaning, broadening and deepening of the river to prevent it from floods. The river will be reinforced by concrete (red line) and water valves will regulate the water level. The light blue line shows the floodplain today, but if the project is carried out, the water will never go further than the river. When they are going to deeper the river they propose to place the landfill along the river marked by a brown surface. Acvaproiect 2012.

The future of River Bîc

River Bîc is included in the green corridor of the city, in the General Urban Plan from 2007, and according to [4]Craicun there are plans to restore and transform it together with parts of the surrounding industrial areas into a green area. The river has potential for flood prevention and as a recreational green area, instead of being a part of the industrial zone as it is today. The restoration of the river demands great financial investments and political will. Until the questions of, who and how are answered, the restoration is a plan for the distant future. When revitalizing the river, solutions will be determined for how to deal with the high speed roads and the railway that stretches along the river. Also, some private industries are still active along the river, making the process more complicated. If the river is restored it has potential of becoming a historic natural monument, as the city once developed on the river bank.

Acvaproiect

According to [7]Pavel Mîndrilă, Acvaproiect has developed a project for reconstructing River Bîc, which was funded by the municipality and City Hall. This project is mainly concerning flood prevention. And the proposal is to deepen and broaden the river to increase the water capacity. The river-banks will be reinforced by concrete to avoid soil erosion and landslides. Along the river water valves will control the water flow and pumps will contribute to the circulation of water and oxygenation.

Except for this they have plans on cleaning the river of sediments. The most efficient way according to [7]Mîndrilă, is to build water catchment ponds on the tributary rivers to prevent dirty water from entering the river. These water catchment ponds would be easier to clean than cleaning the entire River Bîc. Today the surface water goes directly into the rivers. The idea is to collect the surface water from the first 10 minutes of hard rain, which is the dirtiest, and clean it before it reaches the river. The goal is to reach European standards for water treatment systems, but The Ministry of Building and Development, which is responsible for water treatment in Chişinău, is unfortunately still using regulations approved in the Soviet times.

A plan for improving the water quality in some of the artificial lakes within the city is also included in the plan for River Bîc, according to [7]Mîndrilă. The idea is to increase the water circulation by leading water from the river to the lakes and then back to the river. [6]Martin Futter, tells that the quality of the water in the lakes could be further improved through reoxygenation by having fountains in the water.

Also the aesthetic perspective is important to consider when reconstructing the river. In most cities the water source becomes the most attractive place, a recourse and a focal point. In Chişinău, the river is ignored by the inhabitants and an, for tourists, unknown part of the city. [7]Mîndrilă thinks that the image of the city would gain from an aesthetics improvement of the river, which would be an important investment for the brand of Chişinău.

The Project Institute of Ecology and Department of the Academy of Science have made an analysis of the water quality in River Bîc, material on which Acvaproiect based their proposal. Acvaproiect has no specialists working with the ecology of the river and they have not considered how the biological life will be affected by the reconstruction. [7]Mîndrilă tells the project started ten years ago and was inspired by a similar project in Bucharest, where they successfully dealt with the same problem. Due to lack of funding no one knows when or if this project will be realized. Private investors have been contacted but the interest has been too low to receive any financial support.

Other opinions

[8]Ina Coseru (NEC) considers the river to be too small to be rebuilt with concrete. Instead, she proposes to dig the river deeper, and stabilizing the river banks with trees and shrubs. For example willow trees could be planted for their ability to absorb some of the pollutants and slowing the water flow. The willows can also be used for the production of briquettes and pellets for heating.

NEC runs their own on-going project, Bîc River Basin, regarding the water quality of River Bîc. At the first meeting in December 2011 representatives from all districts situated in the Bîc River Basin, as well as Apa-Canal Chişinău, the Ministry of Regional Environment, the Agency of Development Centre and the Mayoralty, met to discuss water health protection. The next steps are to discuss the possibility of setting up a management plan for the cleaning of Bîc, contact possible donors, and to develop the project together with local mayoralties.

There is a big interest from the public authorities along the Bîc River Basin and the initiative has so far been successful. The aim is to have state organisations/ministries in front of this project and not NGO's to be able to be successful.

[6]Martin Futter, agrees with Ina Coseru on strengthening the river slopes with shrubs and trees instead of concrete. A meandering shape will slow down the water flow, and the use of aquatic plants and creation of wetlands will purify the water by absorbing some of the nutrients and heavy metals. Prevent flooding in a natural way is cheaper compared to technical solutions. There will be an initial cost to create "the natural way" but in the long run it will cost less. By introducing small waterfalls and drops, and let the water flow over rocks as well as through the meandering shape the oxygenation will increase. In certain points deeper pools need to be added for sedimentation, to slow the flow, and increase water capacity. It is important with permanent ground cover and use of native species on the riverbanks for water cleaning and habitat creation to work properly.

What Acvaproiect propose, will just speed up the water flow. There are economic, environmental and social arguments for not choosing the technical solution. A natural solution will raise the price of land and property tax level in the area, which will gain the municipality. It is a democratic question because integration of the river with the surrounding nature creates a new and more accessible river with a bigger value for the citizens, says [6]Futter.

[4]Nicolae Craicun, Service for Land Relations, meeting, 16 January 2012.

[6]Martin Futter, Research assistant at the Department of Aquatic Sciences and Assessment at the Swedish University of Agricultural Science, meeting 7 March 2012.

[7]Pavel Mîndrilă, Deputy Technical Director Acvaproiect, meeting, 29 November 2011.

[8]Ina Coseru, Head of National Environment Centre, meeting, 21 January 2012.

LYNCH -ANALYSIS

The Lynch-analysis for River Bîc is based on a pedestrian perspective when mapping the main barriers, paths, nodes, land-marks and districts. The districts shown on the plan are the dense central area, residential areas, industrial areas, and green space, which are experienced as separated areas when you walk through the city.

Barriers

The main barriers along River Bîc are the railway, industrial areas and wide heavy-trafficked roads. The railway runs along the east side of the river in the north and crosses the river to run on the west side in the south. Industrial areas are also main barriers as they often are fenced and have few public roads within them.

Paths

Main paths around the river in the north are Strada Ghidighici and Calea Ieşilor, which connects with the main Boulevard Ştefan cel Mare. There is also a path leading into La Izvor Park. Strada Albişoara is a road lined by green areas where pedestrians move and Strada Petru Rareş connects it with the city centre. Further south, there are few paths adjusted for pedestrians and most roads do not have side-walks.

Nodes

Nodes are mostly constituted by road crossings, where different kinds of public transports meet. Along the river there is a node for pedestrians where Boulevard Grigore Vieru/Boulevard Renaşterii Naţionale meets Bîc but even here the traffic is dominating. Also, the train station becomes an important node as people travelling in and out of the city meet here.

Landmarks

The lake in La Izvor Park is a landmark from Calea Ieşilor and the vast chimneys within the industrial areas are good for orienting while walking along the river. Where the River Bîc meet the Boulevard Grigore Vieru you are in fact close to the city centre, even if you do not feel the connection. Also, the old circus situated on the east side of the river has the function of a landmark, since it is a rather large building facing towards the boulevard, with a very characteristic architecture. The train station is the main landmark in the southern part with a green square in front of it.

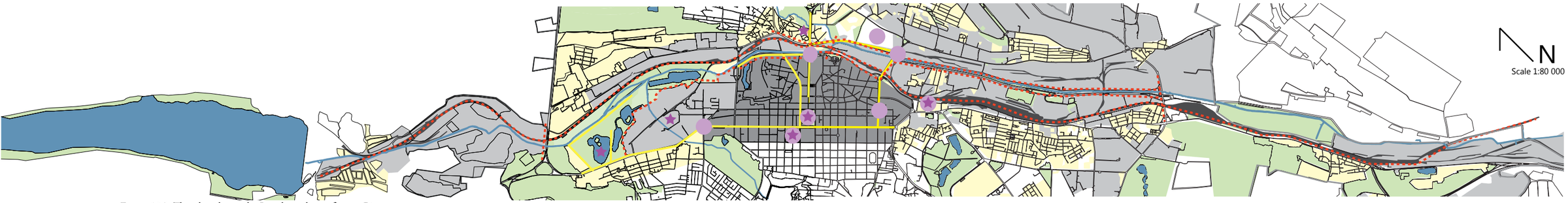


Figure 218: The plan shows the Lynch-analysis of river Bîc with barriers, nodes, landmarks, districts and paths marked.
By: Karin Winroth and Johanna Hagberg.

Figure 222 The railway is a barrier along the river.
Photos by: Johanna Hagberg

Figure 219: There are very few cross-points for pedestrians over the railway.

Figure 220: Stefan cel Mare is a main path for pedestrians.

Figure 221: The abandoned circus is a landmark.

Figure 223: Industrial areas create barriers along the river.

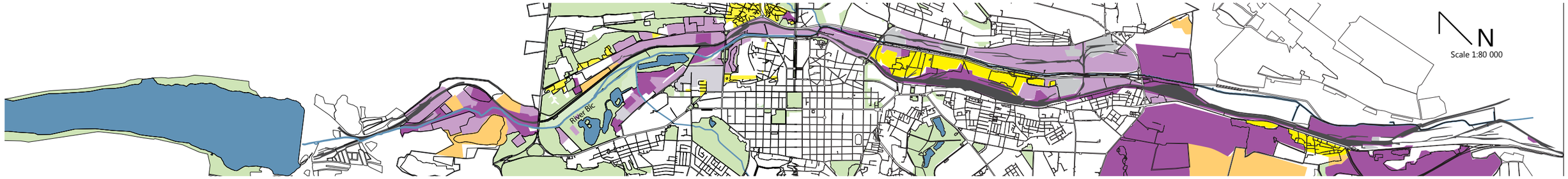
Figure 224: Nodes are mostly where public transport meet.

Figure 225: Vast industrial chimney constitute landmarks.

LEGEND

- City border
- Railway
- Dense central area
- Industries
- Residential area
- Water
- Green space
- Main path
- Barrier
- Landmark
- Node

FUTURE STRATEGY, GENERAL URBAN PLAN



LEGEND

- City border
- Railway
- Special areas, General Urban Plan 2004 (GUP)
- Commercial areas, GUP
- Industries, GUP
- Development, GUP
- Revitalization, GUP
- Water
- Green space

Figure 226: The plan shows the future development for the area surrounding the river according to General Urban Plan. Modified from E-urbanism 2012. By: Karin Winroth and Johanna Hagberg.

The planned future development of the surroundings of River Bîc are presented on the E-Urbanism map at the municipal website (E-Urbanism 2012). There are mainly four planned types of land use along the river, which are industry, commercial, development and special areas.

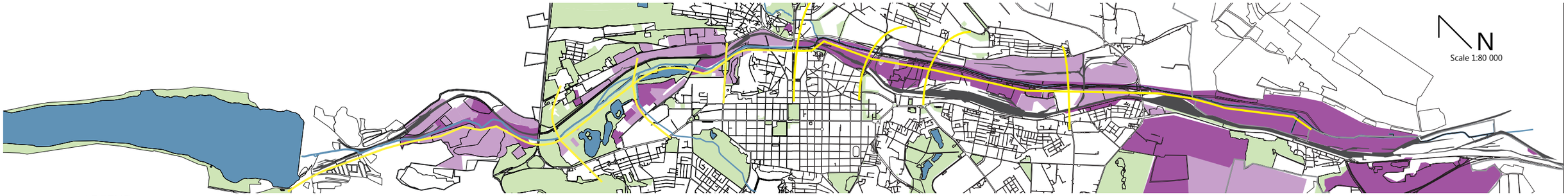
Special areas

The special areas do not allow residential, commercial, or industrial development. Examples of accepted developments are: Airports, churches, education, justice and health institutions, buildings used by government owned organizations, public buildings for recreation and cultural, public utilities and services as: Terminal Transport, bus garages, Tramway depot, Railway Station, Railway, Power Stations, Power Lines, water reservoirs / aqueducts, Pumping Stations, Water Treatment Stations, gas regulating stations, Antenna radio / TV annex buildings, Parks and playgrounds, stadiums, arenas and auditors. This is a wide range of land uses and it is hard to understand what kind of development that are intended.

Development and commercial areas

The development areas are where the new business centres are planned to be situated. The industry shows where it still will be industrial areas and the commercial areas are divided in four types C1, C2, C6 and C7. In C1 areas commercial activities as shops, restaurants, pharmacies, food markets are planned to be placed on the ground and 1st floor of the building. These areas are placed in close relation to present or planned residential areas. Also in the area of C2, commercial spaces are located on the ground and 1st floor, but here they can have a catchment area larger than of the closest residential area. The C6 are foremost for recreational purpose and trade, but also allows residential housing of type R3, which is single-family dwelling, alone or coupled. C7 refers to the commercial functions of land for noisy services like selling and / or presentations of cars, and warehouses.

POTENTIAL LAND USE



LEGEND

- City border
- Railway
- Potential connections
- Potential areas for green public space
- Potential attractor areas
- Water
- Green space

Figure 227: The plan shows potential connections and areas for development of green space. By: Karin Winroth and Johanna Hagberg.

The commercial area, C6, together with the special area, makes room for development of new green areas along the river. We have chosen to name these areas ´Potential areas for green space´. They create an opportunity to link the river with surrounding green areas and increase quality of the public green space along the river. All commercial and development areas can also be used as attractors to make people visit and move through the areas. It could for example be cafés, local food markets, museum, exhibition sites or a cultural centre.

The barrier created by the river and railway could be overcome if more cross-overs for pedestrians were built, connecting the east and west part of the city. The same can be applied for the high-trafficked roads, which surround the river in the south, and disturb the connection with Ghidighici lake in the north. More cross-overs and pedestrian precedence would increase the accessibility.

If the industrial areas are more interlinked with the road network and have pedestrian and bicycle paths, people who are living next to these areas could become more connected with the rest of the city.

SWOT-ANALYSIS

A SWOT-analysis was made as a summary of the strengths, weaknesses, opportunities and threats identified during the inventory and analysis. The analysis is mainly investigating the existing blue-green structure, infrastructure, land use of Chișinău, together with the master plan and future planning potentials of the city.

STRENGTHS

- Green links from Chișinău to Codrii forest.
- Green areas within the city are big and relatively connected.
- Big amount of streets trees.
- Good quality of soil and climatic conditions.
- River Bîc flows through the city and passes the city centre.
- A greening and revitalisation of Bîc is proposed in Spatial Plan Step II, 2006.
- Abandoned industries are to be revitalized along the river.
- Evident historic layers.
- Well-developed public transport.
- Engagement from civil society and NGO's.
- Ambitious regulations for the green environment.

WEAKNESSES

- Extensive agriculture threatens the biological diversity, creates barriers, fractions forest areas and results in a homogenous landscape image.
- Heavy traffic and car domination.
- Lack of parking, foremost in the city centre.
- Weak network for bicyclists and pedestrians.
- Industries, River Bîc, the railways and heavy-traffic creates barriers within the city.
- City centre is being brutally modernised.
- Little variation in the function and character of green space.
- Public green spaces are unevenly spread in the city.
- Polluted air, soil and water.
- Unwelcoming public green spaces due to parked cars, stray dogs, waste and lack of street light.
- Exploitation of green areas within the city reduces the amount of valuable green space.
- Industrial areas along the river, polluting and enclosing it.
- People using the river as a landfill.
- Car-washes pollutes the river.
- Insufficient water treatment plants.
- Regulations are not followed.


Figure 228


Figure 229


Figure 230


Figure 231

Figure 228: The main south entrance to the city built in typical soviet-style.
Figure 229: Street trees.
Figure 230: Well-developed public transport.
Figure 231: Historical traces from the era of the Russian Empire.
Photos by Karin Winroth


Figure 232


Figure 233


Figure 234


Figure 235

Figure 232: Modernisation of city centre.
Figure 233: Heavy traffic in the historical centre.
Figure 234: Cars parking in green space.
Figure 235: The only bicycle path in the city is unaccessible.
Photos by Karin Winroth

OPPORTUNITIES

- Increased development and ecological quality of the existing green structure.
- Mixed-use development.
- A socially sustainable development.
- User-participation when planning public space.
- Improvement of the air quality.
- Wide streets with space for bicycle paths and boulevards.
- Increased accessibility and connections between public spaces.
- Reuse and expansion of green space on old industrial grounds.
- Reduced pollutants in River Bîc and tributaries due to new activities along the river.
- Clean rivers and habitat creation.
- Improved day water treatment.
- Connected green structure with River Bîc as a green spine.
- New uses and functions in the green space.
- More green space in the city centre providing possibilities for varied activities.
- The blue-green structure becomes economic investments as green public spaces and tourist attractions.
- A healthier population.


Figure 236


Figure 237


Figure 238


Figure 239

Figure 236: Parts of old industrial grounds could become appropriated by green space.
Figure 237: River Bîc has the potential of becoming a green spine and tourist attraction.
Figure 238: If the river is revitalized it could support new habitats in the city.
Figure 239: A bicycle and pedestrian network could be developed on the wide streets.
Photos by Johanna Hagberg

THREATS

- Traffic domination.
- Fractioning of green links.
- Increase of barriers within the city.
- The green structure is taken for granted.
- Privatisation of green space.
- Deficient maintenance.
- Urban sprawl.
- Poly-centric development.
- Top-down planning.
- Worsening economy.
- Emigration.
- River Bîc continues being a barrier and backside of the city.
- Continued pollution and landfill in water resources.
- Disconnected green space and city districts.
- Cars prioritised before pedestrians and bicyclists.
- Short-term economic investments becomes unsustainable.
- Levelling of street trees.


Figure 240


Figure 241


Figure 242


Figure 243

Figure 240: Water resources are threatened by continous pollution and waste dumps.
Figure 241: Street trees need to be saved and/or planted.
Figure 242: Green spaces are taken for granted.
Figure 243: Traffic domination is a big threat for the future of Chișinău.
Photos by Johanna Hagberg

CONCLUSION

We found many existing strengths in Chișinău, mostly concerning the rich blue-green structure and the planned reuse of industrial grounds. Future planning strategies, improvement of the ecology of existing blue-green structure, and an expansion of high-quality public space are some of the most important opportunities we have identified. However, for the opportunities to be realised existing weaknesses must be solved. The most significant weaknesses to come to terms with are the reduction of green space due to legal and illegal exploitation of these areas, and the reduced quality of public blue-green structure due to pollutions, traffic, lack of management and little variation in function and character. If these weaknesses are not corrected and the opportunities are not taken there is a risk of increased threats to the quality of blue-green structure, a reduction of public space due to increased traffic and exploitation, and unsustainable development of Chișinău contributing to impaired health, emigration and reduced economy.

PROPOSAL

STRATEGY

This chapter presents out proposals for the green links and infrastructure, park management and river Bîc. According to our opinion, based on the result of inventory and analysis, these proposals are the first priorities, and together they form a strategy for a sustainable future development of Chişinău.

GREEN LINKS AND INFRASTRUCTURE

Chişinău has great opportunities in its raw but promising green structure. The vast green links to the surrounding landscape are very characteristic for the city, and the fact that they have yet not been exploited is of great value for ecology, recreation, tourism, etc. Despite these opportunities the green structure is exposed to an inevitable threat. As a part of globalization, the amount of traffic has increased in Chişinău over the last years. Our proposal is to make a first step towards a sustainable transportation network in the city of Chişinău, with as little impact on the existing green structure as possible. We have chosen to base our proposal on the plan for new ring roads made by the Strategic Committee on Sustainable Development in Chişinău (Craicun, N. 2006), in order to be as realistic as possible. We see the need for a developed road network in Chişinău, especially if the European road network, L1, will be realized. However, we also see some risks with the plan from a social and ecological perspective.

Ring roads

Our proposal is to keep the outer ring road, as it would reduce the traffic in the city by leading the traffic around it. But, to prevent the barrier effect on existing green links, we suggest that ecoducts or green passages should be provided, foremost where triangles are shown on the plan.
The inner ring road would unburden the city centre and its historic parts from traffic. Our suggestion is to move the eastern part of the ring road from its proposed location between the medieval city and the River Bîc, to an existing high-speed road east of the river. This would enable a reduction of the traffic between the city centre and the river, instead creating an opportunity to open up for pedestrian and bicycle paths. Also, if the traffic barrier is removed it would be possible to link the city centre with the river.

Public transport

We suggest that the second ring road is replaced and extended by a public transportation system which does not make such a big impact on the green links as the ring road would. An example of such a system are the Podcars we mentioned in the analysis. They run on electricity which does not not pollute the environment, and they run above ground which releases space for other uses. Also, they could become a tourist attraction and an addition to the identity which reinforces the brand of Chişinău. “Chişinău, the greenest modern capital city in Europe with four visible layers of history and podcars...”. By developing the public transport in Chişinău the present car-domination in the city centre could be solved without the need of the second ring road.

Figure 244: The plan shows our proposal for the green links and infrastructure. Reinforced green links and an extended network for bicyclists and public transport could be a first step towards a sustainable city development. Made by: Karin Winroth. Modified from: ring roads, *Consiliul Municipal Chişinău 2007*, p. 56-57, green links, E-Urbanism, 2012.

Due to the existing traffic infestation in the city centre we find the polycentric planning appropriate, and the proposed business centers provide a good structure for that. However, an opportunity for the future is to plan the city according to the modern way of mixed zones with a diversity of functions and characters.

Bicycle network

The new bicycle paths in city centre, proposed in the General Urban Plan (Chişinăuproiect 2010), are in the proposal extended as a first strategic step, to connect the major residential areas in the suburbs to the city centre and park areas. The distances between these areas are not very long, but due to the lack of accessibility between them and the lack of connections, they are hard to reach today. The paths could also provide the city with new green links and boulevards if they are lined by trees and other vegetation. By developing bicycle paths in Chişinău there would be many positive long-term effects for people and the environment. Problems concerning human health, air and water pollution, traffic congestion, fracturing of green space, tourism etc. would be improved.

Pedestrian streets

Moreover, a pedestrian street is proposed in the General Urban Plan, linking the Cathedral Park with the new market centre. We consider this proposal to be right in time and a beneficial step towards eco-tourism and a friendlier city centre for pedestrians. As a second step we suggest an extension of the pedestrian street further on Mitropolit Varlaam Street to connect the old city with the city centre. Additionally, we suggest also turning 31 August 1989 Street partly into a pedestrians street. Both streets are more intimate then the main boulevard Stefan cel Mare and the commercial activity, already taking place here, would increase if they become more accessible to pedestrians. This proposed extension would allow the city centre to develop west and east of Stefan cel Mare, making the city centre more dense and reachable.

Nodes and green links

Green links which need to be preserved and reinforced are marked with triangles on the plan. Ecoducts and bridges for green passages are examples of how green links could be preserved. An ecoduct being passed by many people everyday along the outer ring road could also reinforce the brand of Chişinău as a modern and sustainable capital city. The circles show new main nodes where pedestrians, bicyclists and public transport meet. These nodes have great potential as new public places where people can meet, rest or just pass through.

Summary

With these suggestions we want to contribute to sustainable development in Chişinău from a holistic landscape architectural point of view. By having a multi-layered perspective and including the existing identity of a place, its history and social value, combined with ecological values the city will become more resilient to changes and impacts from globalization without losing its essence and soul. We also have related to the European Landscape Convention, signed by Moldova in 2004, which encourages its parties to "balance social needs, economic activity and the environment to reach a sustainable development ... and believe that the landscape is the major factor for social and individual well-being and that everyone has a responsibility for its planning, management and protection" (Council of Europe 2000).

We are aware of that parts of this proposal are hard to realise in Chişinău today, mostly due to financial factors. Still, we want to provide visionary goals and inspiration for solutions gaining the social welfare and the ecology in the area. Development of bicycle network, pedestrian paths, public transportation, and preservation of green links are the essence of this proposal.

Figure 246: Podcars are an example of a sustainable public transport which does not create barriers and realeases space on the ground for public spaces. Source: Ultra Global PRT 2012.

Figure 247: An ecoduct is another solution for avoiding the barrier-effect from a road network. This example is taken from: Urbanity.es 2008.

Figure 245: An underpass keeps the green link unbroken and makes it possible for species of animals and plants to spread without disruption. Source: TransWild Alliance 2012.

DEVELOPMENT OF PARK MANAGEMENT

Chişinău is a rich city due to its vast amount of green space. There are green areas from different periods of time, which together with the built structure mirror the history of the city. The green space in Chişinău is divided into public gardens, parks, forest-parks, squares and green along thoroughfares, with different maintenance depending on size and functions. However, during our inventory the green space was not characteristically distinct from one another. Except for the centrally located green space, the difference in character, function and maintenance is not that diverse today. To increase the diversity, and identity of the green space in Chişinău, we propose to add new park categories according to Uppsala's Park Program. The Swedish typology offers a diversification of character, function and management of green space and is based on the size and distance from living area. We also want to add park categories where there is no green space today, or where former green space has been abandoned. Locations of new categories are based on the park characters we discussed in the analysis, and on the deficiency analysis which shows where there is a lack of green space today. This categorisation denotes dissimilar maintenance depending on the type of green space, and offers different park characters, activities and functions in the different park areas.

This new park division could contribute to a greater diversity between green spaces in Chişinău and provide opportunities for different kinds of uses and experiences. More people will have the possibility to find a place suitable for their needs, and therefore the parks will have a greater value to citizens. The new park division should be considered as a complement and addition to the existing park categorization.

City parks

The Cathedral public garden and Ştefan cel Mare public garden are proposed to be city parks due to their central location and importance as attractors in the city. The city parks will be represent the city and be something for the inhabitants to be proud of. They will also function as tourist attractors, which is why they need to be extra lush with flower beds, cafés, and places for rest and socialising. In addition, if the Grigore Vieru boulevard is extended over the river the abandoned green space next to the old circus would be connected with the city centre and have potential as a new city park. It has the possibility to unload the heavily-used central parks, as well as gaining commercial activity and residents on the east side of the river. A culture park interconnected with the old circus could provide the city with a public place for the younger generation, as well as becoming a tourist attraction.

District parks

Further, we propose to turn some of the existing parks and forest-parks into district parks. These parks should be easy to access and diverse regarding character and function. Due to their size and location they have the potential of becoming a green space for the whole district, and a place which many people can enjoy in different ways at the same time.

Neighborhood parks

Smaller parks within each neighborhood are essential for the everyday life of people living in densely populated areas. They should be evenly spread around the city and not further that 300 meters from one's home. We have proposed to turn some of the existing parks and public gardens into neighborhood parks. These parks are situated within residential areas and are used as neighborhood parks today. However, they are not maintained as neighborhood parks today, and their characters are neither distinct from each other, nor is their potential used for creating identity or increasing orientation within neighborhoods. In the north we added a neighborhood park which is just an open grassland today.

Pocket parks

Small parks, such as the ones in the medieval city, are very valuable in an otherwise densely built environment, and it is suggested that they be named pocket parks. A pocket park is less than one hectares big and is foremost used by the surrounding neighborhoods. Due to their size they cannot proved people with different characters and functions as the neighborhood parks do, but they are still important to maintain.

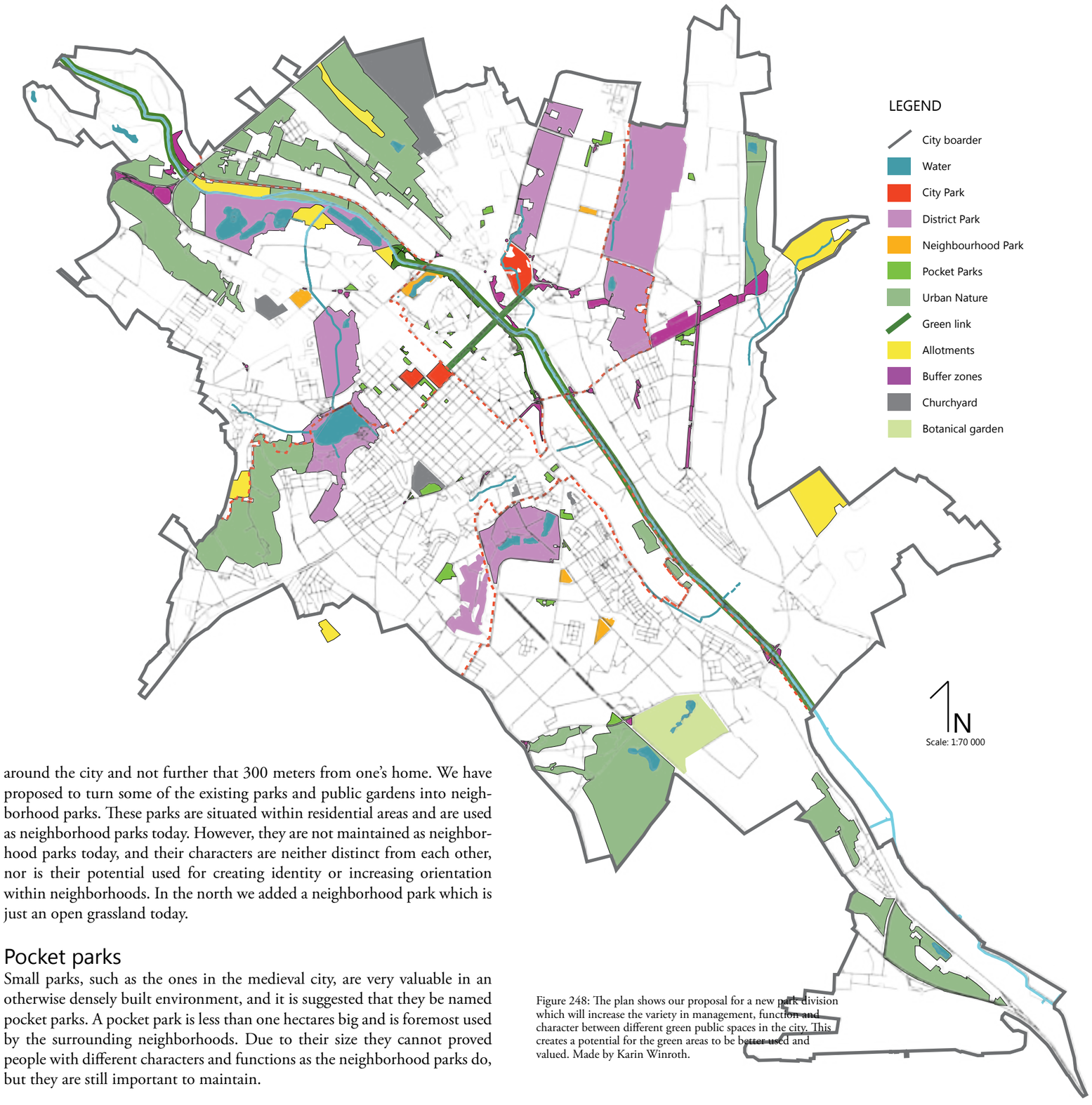


Figure 248: The plan shows our proposal for a new park division which will increase the variety in management, function and character between different green public spaces in the city. This creates a potential for the green areas to be better used and valued. Made by Karin Winroth.

Table showing size, character, functions and maintenance of park categories

	Public garden	Park	Forest-park	Green thoroughfares	City park	District park	Neighbourhood park	Pocket park	Urban nature	Green links
Size	3-20 hectares	Over 20 hectares	-	-	-	>1 hectare	1-5 hectares	< 1 hectare	-	-
Character	Decorative plantations	Rich and varied vegetation	Wild forest-feeling	Varied	Representative, festive and decorative	Decorative with varied spatiality and character	Varied spatiality and character	Small, close to home	Vast with natural character	Varied
Function	Daily rest and recreation	Recreation, sports and cultural activities	Recreation and leisure as camping and sports	Improve urban ambience and aesthetic passages	Daily rest and recreation	Varied activities as sports, play, pick-nick and peacefulness	Green lung, varied activities, meeting place and identity for the neighbourhood	Green lung, orientation, meeting place	Experience, recreation, pedagogic value, primary production and ecosystem services	Social, ecological and recreational values
Maintenance	High maintenance	High maintenance	Low maintenance	Medium maintenance	High maintenance	High maintenance	Medium maintenance	Medium maintenance	Low maintenance	Medium maintenance

Figure 260: Table summarizing the characteristics regarding, size, character, function and maintenance for old and new park division. Made by Karin Winroth and Johanna Hagberg.

Urban nature, green links and buffer zones

The urban nature corresponds to the definition of forest-parks, and demand little maintenance. They provide people with more natural and wild environments for exercise and outdoor life otherwise lacking in the urban environment. The green links show where new parkways along and across the river can be places to connect the green space within the city. Green space in-between residential areas and along the infrastructure network are marked as buffer zones on the plan. They are important as spreading corridors for species of animals and plants and some of them are used as thoroughfares for pedestrians. Also, they contribute to a greener image of the city.

Deficiency of green space

This plan shows how much of the exploit areas that are situated within 300 meters, or closer, to a green area. The green areas included in this analysis are based on all green areas that were found during the inventory of the city together with the proposed new green areas. The distance, of 300 meters origins from the recommendations of Swedish Boverket, Bostadsnära natur where they illuminate the importance of having a reachable green area not further than 300 meters from your home. The darker green shows where the green areas are situated, the light green their catchment area and the orange represents the exploit areas where the green areas are missing. Compared to the deficiency analysis of the existing green areas, managed by Spații Verzi, this solution generates a better supply of green space, but there are still some areas that need to be considered in the future development of new green areas. If the Dendrarium, the Botanical garden and the Zoo were more open this would also decrease the deficiency in the area around them.

Similarities of park categories

CATEGORIES	Public garden	Park	Forest-park	Green thoroughfares
City park	X	X		
District park		X	X	
Neighbourhood park	X	X		
Pocket park	X			X
Urban nature			X	
Green links				X

Figure 250: Showing how old and new park divisions are matched together.
Made by Karin Winroth.

Before

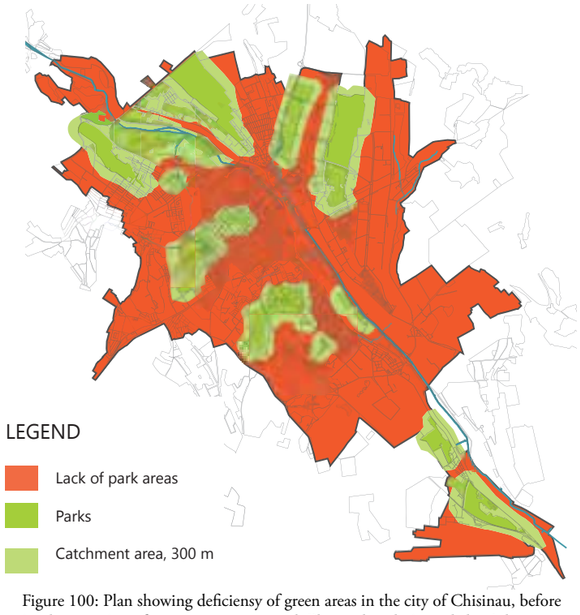


Figure 100: Plan showing deficiensy of green areas in the city of Chisinau, before implementation of management proposal. Plan and analysis made by: Johanna Hagberg.

After

Figure 249: Deficiency analysis of green space, if the park management proposal is implemented. Plan and analysis by: Johanna Hagberg.

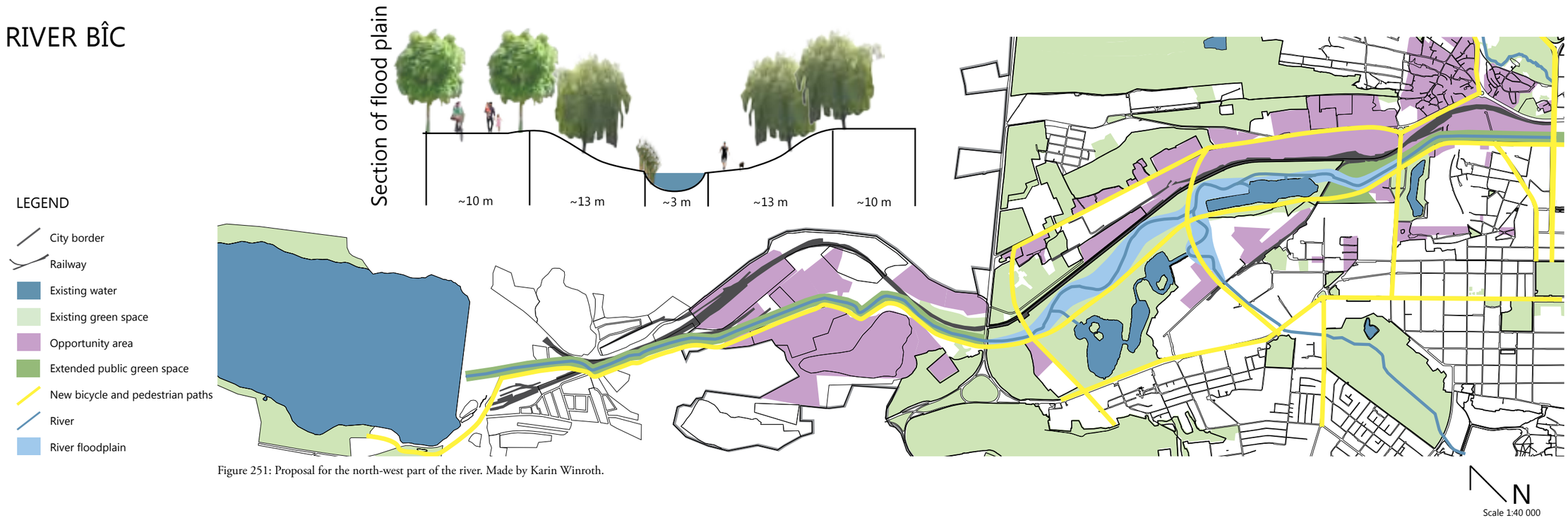


Figure 251: Proposal for the north-west part of the river. Made by Karin Winroth.

One of the first things we were curious about when we came to Chişinău was the River Bîc. Rivers within cities often become the main attraction, a public space where people can enjoy more open spatiality and, of course, the water. When we finally found the river it felt more like the backside of the city than something the city is proud of. Aside from the environmental threats mentioned in the inventory, Bîc also has some visual obstacles such as trash, its small size and it being surrounded by high-traffic roads and the railway. Still, we noticed the grand potential of River Bîc. It floats from the Ghidighici lake in the north, through one of the larger parks, La Izvor. It further passes by the city center and a forest-park, before reaching agricultural land in the south.

Revitalization of Bîc

The proposal is to revitalize and develop the green space along the river as a first step towards improving the ecology and social life in Chişinău. If the river is to dug out and cleaned form sediments and pollution, widened and given a meandering shape its water capacity would increase and more water from Ghidighici lake could enter the river and raise the water level, increasing the flow and oxygenation. The meandering shape of the river will slow the water flow down and the shape relates to how the river historically looked before the canalisation. The river would also become more aesthetically pleasing with more water. A floodplain along the river would protect

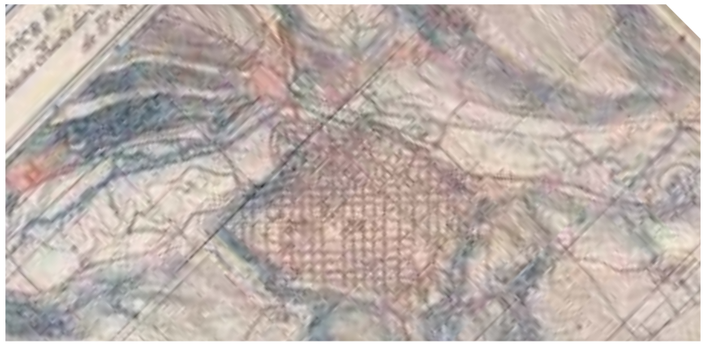


Figure 261: Historical map from 1920 showing the original meandering shape of the river. Source: Larsson, B. & Skoog, G. 2009, p.29.

the surrounding area from flooding when the water is high, and when the floodplain is dry it could function as recreational parkway for pedestrians.

New public green spaces

In the south where Bîc floods out from the city, a semi-natural park area could be constructed, with parallel flood plains to catch and store large amounts of water. This area could become a recreational area with a wilder character. If pedestrian and bicycle paths are laid down along the river, from Ghidighici lake to the semi-natural area, the north and south part of the city would become better connected and more easily accessible. At some points along the river more arranged places for meetings and rest could occur, providing an especially interesting view. A suitable place for a smaller public park integrated with the parkway is where the bicycle path along the river meets the National Renaissance and Grigore Vieru boulevards. The existing forest-park, Calea Basarabiei, also has the potential of becoming more accessible and appreciated if the parkway and bicycle path pass by.

New connections

A pedestrian and bicycle path along the river needs to be well connected to the rest of the city. The plan shows our proposal for how to connect the east and west side with bicycle paths. These connections will become extra useful if the present industrial areas are turned into commercial and residential areas. The surrounding developments could be a way to use the private sector to engage in new activities along the river, such as different types of service and commerce. There would be a win-win situation where the development of the river triggers activities in the area, and where the new development increases movement along the river. We also propose to use some of the areas reserved as Special areas in the General Urban Plan (INCP Urbanproiect et.al. 2004), to extend the green space along the river. It is important that the green space along the river is interlinked for it to be useful as an ecological

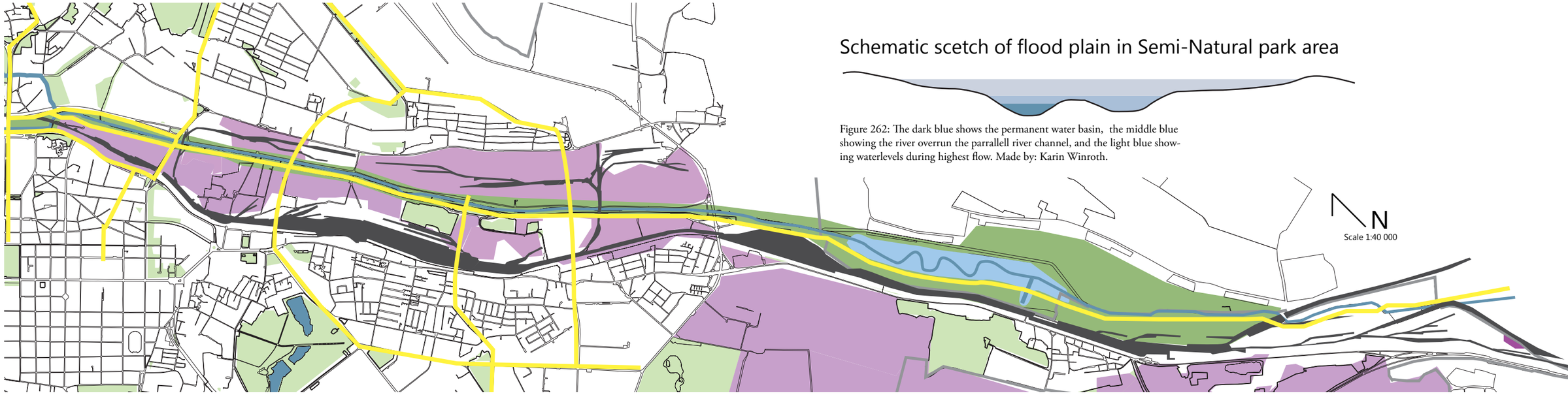


Figure 262: The dark blue shows the permanent water basin, the middle blue showing the river overrun the parrallell river channel, and the light blue showing waterlevels during highest flow. Made by: Karin Winroth.

Figure 251: Proposal for the south-east part of the river. Made by Johanna Hagberg.

corridor. People will not be encouraged to walk or bicycle along it if there are interruptions along the way.

Plant proposal

The plant proposal shows suitable plants to be planted in or next to the floodplain. Some of them are planted to purify the water through phytoremediation, which means that plants are used for reduction and/or removal of contaminants from polluted water, soil, sediments and air. This method has a lower cost compared to other remedial methods such as excavation (EPA 2012). Other plants are chosen because they are native and will therefore contribute to habitat-creation hosting a greater variety of species, including some of the red listed species introduced in earlier chapters. The proposed floodplain, together with the plant proposal, will provide suitable conditions for the red listed plants and animals in the table to the right. These red listed species exist in the surroundings of Chișinău and a restoration of river Bîc would provide a good opportunity to support their survival in the area. Their existent along river Bîc also provides an opportunity as a tourist attraction and a reminder of the values of biodiversity and the natural heritage of Chișinău.

PLANTS	COMMON NAME	QUALITY
Acer pseudoplatanus	Sycamore maple	Native
Alnus glutinosa	Alder	Water purification
Betula pendula	European wild birch	Native
Carpinus betulus	European hornbeam	Native
Phragmites australis	Common reed	Water purification
Prunus avium	Cherry tree	Decorative
Quercus robur	English oak	Native, habitat creating
Carex spp. Juncus	Sedge-Rush	Water purification
Salix x sepulcralis	Weeping willow	Water purification
Tilia cordata	Little-leaved linden	Native
Typha latifolia	Common bulrush	Water purification

RED-LISTED PLANTS	COMMON NAME	HABITAT
Calliergonella cuspidata	Calliergonella moss	Springs ans stream borders, oak, beech, hornbeam, maple.
Climaticum dendroides	Tree Moss	Moist soil with oak, maple, and hornbeam.
Dactylorhiza majalis	Broad-leaved marsh orchid	Phytocenoses of graminae-different herbs and sedge-graminae.
Daphne mezereum	Daphne	Along rivers and with oak, hornbeam, maple, beech.
Eriophorum latifolium	Broad-leaved cottongrass	Hayfields on river valleys.
Euonymus nana Bieb.	Turkestan Burning Bush	River meadow forests, oak, maple and hornbeam.
Lunaria annua	Annual Honesty	River slopes, linden, oak and hornbeam glades.
Nymphaea alba	European White Waterlily	Stagnant and slowly flowing waters.
Ophioglossum vulgatum	Southern adderstongue	Moist dale, oak and hornbeam.
Orchis palustris	Marsh orchid	Graminae-different herbs in river valleys with oak, hornbeam, beech.
Rhaponticum serratuloides	Giant scabiosa	Flooded hayfields on salinized soils.
Salvinia natans	Salvinia	Riverbeds with slow flowing water.

RED-LISTED ANIMALS	COMMON NAME	HABITAT
Emys orbicularis	European pond turtle	Quiet water, flood plains, gentle slopes with common reed & other aquatic plants.
Felis silvestris	European wildcat	Forests and marshes, shelter in laid reed thickets.
Mustela erminea	Weasel	Willow riverside coppiced, reed sheaves in winter.
Pelobates fuscus	Garlic toad	Forest on flood plains of rivers, reproduces in slow waters.
Serinus serinus	Common Serin	Anthropogenic landscape, planted trees and shrub.

FIRST STEP

This chapter shows our conseptual visions for four new green places and two green parkways. These are key-places in the city with the potential of connecting the public space and give room for new functions and uses.

CONNECTIONS

To sum up our main ideas for the green structure in Chişinău we have developed a principle where a green spine, developed along River Bîc, represents the first strategy of green structure development. This strategy is based on our inventories, analysis and proposals described in earlier chapters, and the result from the public workshop.

Through conceptual visualizations we want to show possible visions for four new public green places, in key-positions in the city. These places are a Culture Park in the space next to the old circus, a Pocket Park where the Boulevard Grigore Vireru crosses the river, a development of La Izvor Park and a Semi-Natural Wetland in the south of the city. The Culture- and Pocket Parks are connected with the central parks through an extension of Boulevard Grigore Vireru. A parkway along the river connects the recreational area at the Ghidighici Lake, in the north, with La Izvor Park, the city center and the Semi-Natural Park in the south of the city. The new public green spaces have potential of becoming stepping stones, which connects the green public space, as well as becoming main points for new functions and uses.

The foundation: City Parks

Cathedral public garden and Ştefan cel Mare public garden
The first place constitutes by the existing Cathedral public garden and Ştefan cel Mare public garden, which according to our proposal for the new park division becomes city parks. From the workshop we found out that:

“The central part exposes our rich history, is decorated for different events and it is green” and “I like the centre of the city very much, the Arch of the Cathedral, because of the activities”.

These city parks are appreciated and become the foundation upon which the principle is built. When people come here they either stay to enjoy the pulse, or move along Boulevard Grigore Vireru, which is, according to our vision, well-connected with Cathedral Park.

Figure 252: Picture of Ştefan cel Mare public garden.
Made by Johanna Hagberg.

Figure 253: Picture of Cathedral public garden.
Made by Johanna Hagberg.

Connections: Green Spines

When the Boulevard Grigore Vireru is extended over the river it connects the city centre with the eastern part of the city. This will provide people with the opportunity to walk or bike between these areas without being disturbed by car-traffic. The path for pedestrians and bicyclists along River Bîc will create the opportunity to reach the north and south parts of the city by foot. An environmental friendly solution for public transport is envisioned by pod-cars, which also will decrease the need of car use.

Figure 255: Konceptual visualisation of the pedestrian and bisycle path along Boulevard Grigore Vireru. The picture below show the present situation. Made by Johanna Hagberg.

People participating in the workshop believe: “The River would be nice with some less trash and some paths and less pollution and some folks and less dogs!” and “River Bîc has ties to the historical core of the city. It needs to be cleaned, both river and the area around it. Historical reconstructions maybe and make it popular!”

Combined with a revitalization of the river, this green link could become a very well-used path with people passing by or staying in some more arranged places along the river enjoying running water and the wildlife. The meandering shape we propose for River Bîc in the earlier chapter is based on how the river once was shaped, and will together with the return of former flora and fauna become a historic reference. Reinforced by information signs this could become an attraction for the inhabitants and visitors. This proposal is a way to encourage people to walk and bicycle more, as well as create new green areas and connect existing ones.

Above. Figure 254: Konceptual visualisation of the pedestrian and bisycle path along River Bic. The picture below show the present situation. Made by Karin Winroth.

Figure 256: The visualisation of the Culture Park with the old circus in the background. The picture below shows the present situation. The visualistaion to the right show possible cultural events in the abandoned circus. Made by Karin Winroth.

CULTURE PARK

The abandoned green space next to the old circus has the opportunity to become a new city park, linked with the central parks through the extended Boulevard Grigore Vireru. One person wrote: “Renovate the circus!” during the workshop, and when visiting the city the old circus appears to be one of the first things the citizens show to the visitors, after the Cathedral and Stefan cel Mare statue.

There have been plans on building a new football stadium here but the project has been postponed. Our vision implies that this place becomes a new city park, the “Circus park”, and that the existing Sport Complex Zimbru and Stadionul Republican are used as sport stadiums. A small river is running through the area and can be an integrated part of the park being cleaned and used for recreation and create habitats for native species. The Circus Park has the potential of becoming an extension of the abandoned circus, and a more culture inspired public space where the historical use could be resumed with a modern touch.

A place for all people

There is a need of places and activities for young people in Chișinău. This vast green space has the possibility of housing many activities taking place at the same time, directed towards varied groups and interests. Examples of uses are temporary or permanent art installations, workshops, concerts, sport activities, conferences, a neutral place for public participation regarding city planning etcetera. Both young and old people would be able to find something of interest here, with the possibility to create interaction between generations. It could become a free city park encouraging creativity as an addition to the more arranged central parks.

POCKET PARK

Where Boulevard Grigore Vireru intersects with the river we see the opportunity for a new pocket park as a stepping stone from the Cathedral Park to the Circus Park. This is a node where pedestrians, people biking or using public transportation will meet. In connection with the river and Boulevard Grigore Vireru a wider green space is situated which has a potential of becoming a public space. It could become a place triggering different senses absorbing the traffic noise along the adjacent roads. One could stay here to rest, socialize, listen to the running water and enjoy flower beds with flourishing beds of perennials.

Figure 257: Visualisation of the new Pocket Park where Boulevard Grigore Vireru intersects with the river . The picture below show the present situation.
Made by Johanna Hagberg.

LA IZVOR PARK

River Bîc runs through La Izvor Park but is today not connected to the park, but runs along it unnoticed. Together with the railroad the river is mostly a barrier between the park and the eastern residential areas. To solve this problem we here show an example of how the river could become more integrated in the park and become a decorative natural part instead of an obstacle to overcome. Bridges for pedestrians and bicyclists crossing the river would improve the accessibility and increase the use of the park. These crossings will become especially important if surrounding industrial areas are developed into housing or commercial areas. These new nodes, where pedestrian and bicycle paths meet, could be equipped with benches and viewpoints for meetings and rest. The visualization shows some of the red listed plants that used to live in this kind of environments. If the river is revitalized these kinds of habitats could be restored, reinforcing the identity and history of the river.

Figure 258: Visualisation of La Izvor Park connected with River Bic.
The picture below show the present situation.
Made by Karin Winroth.

SEMI-NATURAL PARK

In the south we envision a green space called the Semi-Natural Wetland Park. Our proposal is to turn the area between the Munceşti forest-park on the west side of River Bîc, and the village called Bîc on the east side, into a wetland park. The main function for this park would be to contribute to flood prevention. By creating a wide river bed with parallel flood plains the water can take several ways and big amounts of water can be stored. This way, the water will flow through the city centre faster and decrease the risk of flooding there, as well as hinder flooding further south. Also, the wetland park could become an extension of the wastewater treatment plant immediately north of this area, through plantations of water purification plants. Except for flood prevention and water cleaning this area has great potential of becoming a more nature like recreational area with some of the water living red listed species introduced. Connected with pedestrian and bicycle paths along the river, it would not only become accessible for people living in the surroundings, but also for people living in the city.

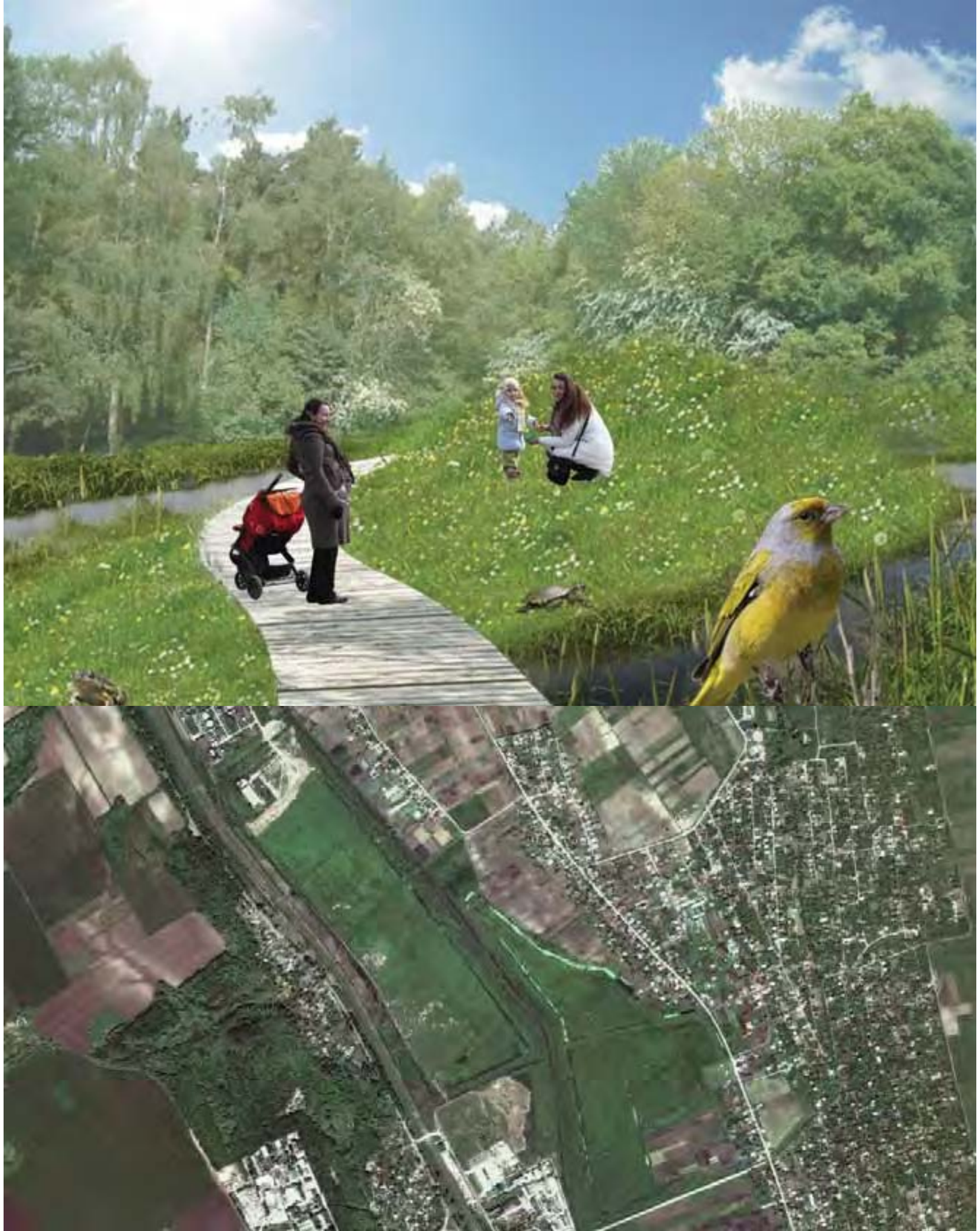


Figure 259: Visualisation of the Semi-Natural Park in the south of the city. Made by: Karin Winroth. The picture below show the site from Google Maps.

DISCUSSION

FINAL CONCLUSION

The aim with this study was to make a proposal for a Green Structure Plan for Chişinău based on sustainable development from a social and ecological, and to some extent economic perspective. Chişinău has such great potentials in their green structure due to size and location why we consider this goal to be reachable with rather small means. However, as the country transforms and focuses on the western standard regarding economy, politics and culture, a new way of using public space follows. The older generation, raised in Soviet times, uses the parks for exercise, meetings, and as an extension of their living rooms, while the younger generation has other demands of the green space. According to our observations and interviews, young people want the possibility to use the parks in a more free and diverse way, being able to for example play football, skateboard, roller-skate, and have a coffee or a meal in the park. Based on the history, identity and existing functions of the green space in Chişinău, we see the possibility of a more varied use where different generations can meet, if new park characters and functions are added.

As Chişinău has not yet disrupted the existing green links and wedges there is a possibility to use them to according to achieve resilience towards climate change and the risk of degradation of valuable eco-systems. However, to realize this, the existing green structure needs to be cleaned from pollutions and revitalized with a diversity of native species and ability to attract the younger generation. There is also a great opportunity in turning the River Bîc into a public green space, a tourist attraction, and an ecological corridor connecting existing green spaces. The value of green space needs to be acknowledged and protected against exploitation in combination with a following up of the existing ambitious set of regulations concerning the environment. A sustainable development of Chişinău could further be encouraged with a well-developed environmentally friendly network of public transportation, and pedestrian and bicycle paths connecting the east and west part of the city and the suburbs.

DISCUSSION

Borlänge Green Structure Plan has been used as a good example in this thesis. Borlänge Green Structure Plan contains a policy section, a section with comprehensive plans, and an extensive part with detailed plans of all districts in Borlänge. However, due to limited time for gathering information, observations, interviews and analysis on the site our work had to be limited. The first part considers a larger scale of the blue-green structure and infrastructure of Chişinău. General Urban Plans for the municipality of Chişinău are also included in this part of the Green Structure Plan to anchor it in reality, and for us to be able to affect reality from a green perspective. More developed studies and guidelines for the blue-green structure are a desirable next step and a useful tool for the district authorities. To be able to provide an example of a green structure plan on a more detailed level we decided to focus on the forest-parks, parks and public gardens within the city border. Based on the public workshop and our observations we wanted to provide the municipality with a new tool for the planning and management of public green space based on the existing park divisions. Hopefully, Patrik Grahns park characters can contribute to an extended perspective and valuation of the existing green space and the needs for the future. In order to make the management proposal for all the parks in Chişinău, further inventories and analysis need to be done for some of the forest-parks we only discuss shortly on page 74-75.

The intention with performing a public workshop was, except for gathering the public opinion about the green space also made as an inspiration of how to include the civil society in the planning process. Our initiate aim was to gather groups of people from different residential areas for more detailed workshops, but since we did not have the resources needed (contacts, language-knowledge, space or time) we decided to use social medium and make an open public workshop outdoors in the city centre.
River Bîc and its surroundings were chosen to show how a more elaborate study of a district can be done. We consider the river to be of high priority for the development of the blue-green structure in Chişinău because of its bad conditions and its importance for the future development. The proposal Acvaproiect made for a revitalisation of the river is interesting but according to our point of view, too costly and high-technologic, lacking an ecological and social perspective. On the contrary, a more natural way of solving the problem would not only improve ecological and social values in the city, but also decrease economic investment in the long-run.

This quote, taken from the European Landscape Convention, can be described as the fundament of our project:

“The landscape is an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognised as being of outstanding beauty as well as everyday areas”

We tried to get a grip of the Republic of Moldova before our field study through literature about history, politics, and culture, but still it was hard to predict the outcome of the trip. However, we immediately felt welcomed in Chişinău and people were very friendly and helpful. At first sight, Chişinău appeared as any former Soviet city, with wide boulevards and high-rise buildings. But at a second glance, we saw other historic and cultural layers appearing. The city centre has traces of medieval times and the Russian Empire, mixed with advertising and modern high-rise buildings affected by western society and globalism. Also, the multilayered culture is present as a part of the population still speaks Russian, a subject we has some interesting discussions about with our new Moldovan friends. Many of the people we spoke to seemed tired of talking about the past, with oppressions from the Soviet Union and the slow recovery after the independency in 1991. They hoped for something else for their family and friends in the future, and most of them thought about the approach towards the European Union as a possible way. Also, most of the people we talked to are emotionally engaged in the green space of the city, and feels proud of living in one of Europe's greenest cities. For us, is it obvious that Chişinău owns a very valuable resource in its green heritage. We saw some beautiful public gardens and parks well-taken care of and diligently used by the citizens, but also it was disappointing to see how others were totally abandoned and treated as landfills, and not used as public green spaces as they once were planned to be.

Reflections on method

Unintentionally, the preparatory phase became about two months long, due to the fixed procedure of a Minor Filed Study, during which we had time to do literature studies about economy, politics, history, culture, ecology, and biology. Even though the subject of this master thesis does not deal with economy or politics very deeply, it has still been necessary to know the background of these subject since everything is interlinked. We are therefore glad that we had some time to try to understand Moldova, and where the country is today. The case studies of Borlänge Grönplan and Uppsala parkprogram has been useful guidelines for our work. During the education we have not worked with Green Structure Plans and neither of us had a clear picture of what is supposed to be included in one, why the case study was necessary as a guideline. However, since s Master Thesis covers 30 degree points equal to 20 weeks, to which we have to adjust the extent of the project, we chose to not fulfil every part of our case study.

Our observations have been limited to the period for the field study, which has been both good and bad. Good because we had to focus early and plan what we wanted to see, and approximately when the observation had to take place. It has been harder when things did not happen the way we planned, for example, when we realised we would not be able to make detailed inventories and analysis on every existing park if we wanted to go deeper into the River Bîc. Though it would have been useful we did not have time to make detailed inventories of plant material in the park areas. Instead we focused on red listed species and legislation of green space, to highlight the fundamental factors behind green structure planning. A detailed inventory of plant material is one of the steps to follow in order to implement this plan. Another would be a more extensive public workshop with citizens from different background, ages and interests. Maybe the most important next step is to gather all expertise involved with the future planning of Chişinău to discuss the green planning perspective of the city.

We have learned that some things can not be planned until the observations start since it is very hard to know before hand what to focus on and what people to meet for information. Being open minded and flexible has been a very useful method during our filed study. A meeting often resulted in a couple of new informers suggested, people we would not have got to know about on our own.

When starting the field study in Chişinău we started with inventories and analysis of the green space before any experts were contacted. Firstly, we wanted to create our own impression of these places, and secondly, we wanted to know more to be able to get the most out of the interviews, asking the right questions and knowing what places people were referring to. After getting an overall understanding of the public places in the city we started our interviews. Most of the meeting were booked rather short in advance, and we had to be flexible, and luckily our translator was too. About half of the people being interviewed needed a translator but we never had any problems arranging one. Using a dictaphone during interviews were a very useful tool as we could then focus on asking questions. Also, the dictaphone was useful as we noticed that we sometimes understood the answers differently. However, we are aware of that using an interpreter is an added step of interpretation where the original version could accidently be modified without us knowing about it. The same risk counts for the translated literature but has been out only choice to get the information needed.

Inventories were made through discussions and photo-documentation as we walked around in the green spaces. We did not make inventories by car, but partially through public transport. A limitation was the stray dogs which lived in generally every park area, particularly in the vast forest-parks less used by people. As we are not used to stray dogs, and therefore had a hard time to predict how they would react when we stepped into their territory, we decided not to investigate parts of the green spaces were we felt threatened. As a complement we asked people we met about the areas we did not see and looked at maps and plans.

From the inventories we made analysis of the spaces we visited. We found it hard to use Patrik Grahns method regarding the park characters at some points due to the method being rather detailed. Also, we found some areas being very similar to several park characters why it was hard to only chose one. We solved it by showing some park characters combined on some of the plans. Doing a Lynch-analysis of the whole city was also rather difficult and demanded extended inventories. However, it was a useful tool for showing the main barriers, paths, landmarks, nodes and site lines, all necessary for an increased understanding of the city. SWOT-analysis was a good way for us to sum up the main concerns and opportunities for the green spaces of Chişinău, to lead us through the project and clearly show the reader what we have found and prioritised.

The public workshop was a way for us to get the opinion from people using the spaces and not only being experts within fields concerning green public spaces. Our aim before the trip was to make somethings close to a Sociotope guide, doing several workshops with people living in different areas, with different ages and backgrounds. This was not possible due to the time limit so se decided to make it more simple and had one public workshop instead. The location was successful as many people passed it but rather few people dared to ask and participate. Also, doing it in the middle of winter time made it harder for us, and for getting the interest from people passing by. Fortunately, we announced the event on Facebook before it took place and most of the people taking part knew about it from that event.

Reflections on producing plans and writing

It was hard to plan the structure of the work beforehand as the outcome depended on the information we found in Chişinău. During the field study

we discussed the overall structure and in what ways we could present it, and during the Christmas holiday we produced most of our plans for the inventory. When we returned from Moldova in February we focused only on the production of texts and remnant plans, which became more time consuming than we thought beforehand. Compared to the Bachelor Thesis, this project has been much more comprehensive, and we have felt a bigger responsibility as the outcome will reach Chişinău City Hall. During the process of writing and producing plans we have changed the structure of the work for it to become as pedagogic as possible for the reader. New issues and possibilities has occurred during the process of writing, why plans needed to be changed to make images and written words correspond. One major lesson has been that a project like this takes a lot of time and that rushing through it will only make the work load heavier.

Reflections on working in pairs

This project has been very extensive why working in pairs has been a benefit regarding the production of plans and written material. Also, it has been a comfort being two during the field study, doing interviews, inventories and analysis. We have had a similar view on the current opportunities and issues of green space in Chişinău but also we have complemented each other, noticing different things which have resulted in some interesting discussions and a better result. Working together has also been a good practice for the future as landscape architects mostly work in project form with others. However, much time has been spend discussing what to do and how to do it, which hopefully has resulted in a more elaborated project.

Our first intention was to make inventories and analysis together and the proposals separately, to be able to show our individual work effort. But, along the way we realised this would only be a forced situation upon our work since we mostly shared the same ideas about the outcome of the work. Also, it has been difficult to split the load of work in two, as we both have been involved in all parts of the work where we have discussed and edited each others material along the way.

The experience has been very positive for both of us and we have learned about green structure planning in general, and green structure planning in Moldova. Apart of that, we have gotten to know a country we did not know much about before, and widened our personal understanding of a new part of the world. The people we have met have been much more helpful than we could imagine beforehand, and the project would have been much harder without their advices for new sources of information.

Possible future scopes

Promotion of public transport and the bicycle as a sustainable transport.
Development of user participation in the planning process in Moldova.
Reintroduction of native species.
How green space can affect the welfare in a positive way.
How to meet globalisation and capitalistic trends without losing identity of place.

Thank you for reading! Good Luck with the future development of Chişinău!

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