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Sustainability and Quality of Life in Urban Planning

UAU214F

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INTRODUCTION

International agreements and pressure on the governments to formulate a policy and set goals for sustainable development has been increasing substantially in recent years. One of the tools that can be used to enhance the sustainability and impact on quality of life in the urban environment are the emphases and actions in urban planning. Problems such as increased use of private cars, with their pollution and larger regions undergoing the infrastructure is growing. Declining services within neighborhoods, lack of neighborhood awareness, uniformity in building types and the composition of the population, less attractive and poorly connected local environment are some of the issues that many neighborhoods deal with and have a major impact on the quality of life of residents. As Reykjavik Capital Area will continue to develop and flourish, we must envision and design common future, that focuses on improve the city's sustainability and the quality of life of its inhabitants.

We have Reykjavík in mind when we look at aspects of sustainability and quality of life. Scattered city in the northern hemisphere where the energy consumption for house heating is relatively environmentally friendly. It gives a different perspective to view the city in a large context or just to view the local community, where you assume that “neighborhood” is a community unit. You can define “neighborhood” from the following factors: administratively - by ward or parish boundaries aesthetically - by distinctive character or age of development socially - by the perceptions of local residents functionally - by catchment areas for local services environmentally - as traffic-calmed areas where through traffic is excluded and the quality/safety of the living environment is paramount (Barton et. Al, 2010). A mix of two or more are often present. No single definition is better than the other, and no clear answer can be given without further research. In our opinion it is necessary to redefine the district distribution in Reykjavík from ideas that fundamentally encourage the creation of strong local communities where sustainability and quality of life are the key words and the “neighborhood“ or “local community” is one of the more promising areas for sustainability in urban areas (Wheeler, 2004).The sense of belonging to a community promotes peoples motivation for acting on problems that are close to them and affect their quality of life. People feel interconnected, responsible and often share common goals. Strong social relationships affects health and wellbeing and decrease in the likelihood of: seasonal viruses, heart attacks, strokes, cancer, depression, and premature death of all sorts (Putnam, 2000).

Sustainable development in urban planning

The dominant model of development, characterized by large-scale industrialization and neoliberal policies, is unsustainable in terms of its role in the marginalization of many segments of human society and the exploitation of natural resources, energy, water, food, space, landscape. It is an imperative need for a development model that is more sustainable, because it is important to break out of the unilateral ideology of development and incorporate democratic pluralism. Urban planners are discussing the important aspects of a community-centric development model that form the foundations of sustainability, namely, community control and management of resources, community reliance. Urban planners in Reykjavik are little by little becoming more confident with the concept of sustainable development, and their quest is to create more holistic planning frameworks and community-based planning processes, discussing the meaning of sustainability in terms of city size, urban form, and transportation.

In this research we will attempt to answer to these questions and to develop a set of tools and an action plan with the help of System Thinking methodology.

Integrated action plan development

These actions can mean “more cohesive vision of the future, a stronger sense of place, a shared understanding of community assets, more efficient use of resources, healthier ecosystems, more productive partnership among community stakeholders, and public dialogue that is engaging, inclusive and constructive” (Hallsmith, 2003). These actions can also mean providing the citizens with safer neighborhoods, higher-quality of education system, better-paid jobs, pleasant and healthy urban environment, a more socially connected community. Involvement of the community in building up the a vision and an action plan is crucial. Making surveys asking the community what they like about the city, what they want to change, and what are their ideas for change in the next 30 years. Unlike private companies, municipalities are the last organizations to adopt innovative strategies for management and service delivery. Public official are more under scrutiny then private businesses, and a mistake would cost their reputation and the taxpayers’ money. Resources are often scarce and it is difficult to invest in long-term projects (In Iceland only new aluminum plants has received long-

term investments). Therefore municipal officials are involved mainly “in short-term problem solving, crisis management, and Band-Aid solutions” (Hallsmith, 2003).

System Thinking in sustainable urban planning

System thinking is a framework for analysis and management based on the assumption that each component of a system can be understood accurately only in the context of the system as a whole. Systems thinking focuses on *root causes* of undesirable situations rather than on problems which are merely symptoms, and directs resources towards addressing the root causes to bring about lasting, long-term improvement. Systems thinking is only one of the skills needed for sustainability planning, along with group process skills like leadership, teamwork, facilitation and conflict management, and methodologies including public participation (Hallsmith, 2003).

The Brundtland definition of Sustainable Development works well for municipal operations as cities are in the needs satisfaction business - needs relating to: health and well-being, empowerment and responsibility, economic security, services and infrastructure, ecological integrity.

A system is an integrated set of elements which behave as a unit. Cities are complex systems and exhibit the characteristics of systems, including emergence, dynamic change over time, and change driven by feedback loops. Insights from system dynamics are applicable in thinking about our cities as systems: 1) It is easier to steer the system in a new direction than to fight it. 2) Feedback produces patterns of behavior that reveal leverage points for change. 3) Often obvious solution turns to be wrong, and will make the situation worse. Problem-based planning often fails because it ignores the core issues. Fixes that fail are those that focus on the superficial aspects of a problem.

Systems thinking bring success by identifying leverage points that are otherwise difficult to see. System intervention points range from the less effective, such as controlling the numbers, to the powerful, such as shifting paradigms and mind sets. System interventions are often counter-intuitive. Effective community leverage points include: increasing awareness and education community spirit, prevention programs, early intervention, conflict management, community centers.

Human needs, quality of life and the transition towards a more sustainable city

When approaching a project like this, that involves planning, transformation, progressive and radical system changes in the capital of Iceland, the first thought goes to Robert Pirsig's quotation reported in Donella Meadow's book on System Thinking: „If a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory.“

Paraphrasing this statement for our project, we can say that we won't be able to find durable solutions and design a sustainable set of policies that will improve the quality of life of Reykjavik, if we don't understand and change the rationality that produced the existing urban system, heavily dependent on private transport, lacking on neighborhood's identity and sprawled on a vast area.

This premise is crucial to any systematic urban change: we must begin to change first those patterns of thought that shaped Reykjavik in the last 30 years. The task is huge: to lower the city metabolism, to create a livable and more equal city that improves people wellbeing and that answers to our material, social and moral needs. Once the material needs are satisfied the individual aspires to values not necessarily linked to consumption of economic goods. As soon as these social and moral needs gain more importance, the traditional economic evaluation of wellbeing relatively decreases.

It is natural then to begin with the definition of wellbeing. According to (Bailly , 2000) wellbeing is the individual evaluation of his possibility of self-realization through work, culture and the social life. This evaluation corresponds to the measurement of the difference between of what we desire and what actually exists. As you understand, the concept of wellbeing is subjective, therefore must be mediated with the concept of quality of life which can be measured objectively.

In our opinion there is no doubt that the functioning of a city system (transportation, safety, quality of air, water, noise, cultural life, social life, services, etc.) and its consequences on our daily life, is the most important element influencing of our satisfaction, which has its foundations on the concepts of wellbeing and quality of life.

Already in the Eighties' in Europe, the discussion was about the shift from the industrial cities towards the post-industrial cities, with the increasing number of people employed in the tertiary and

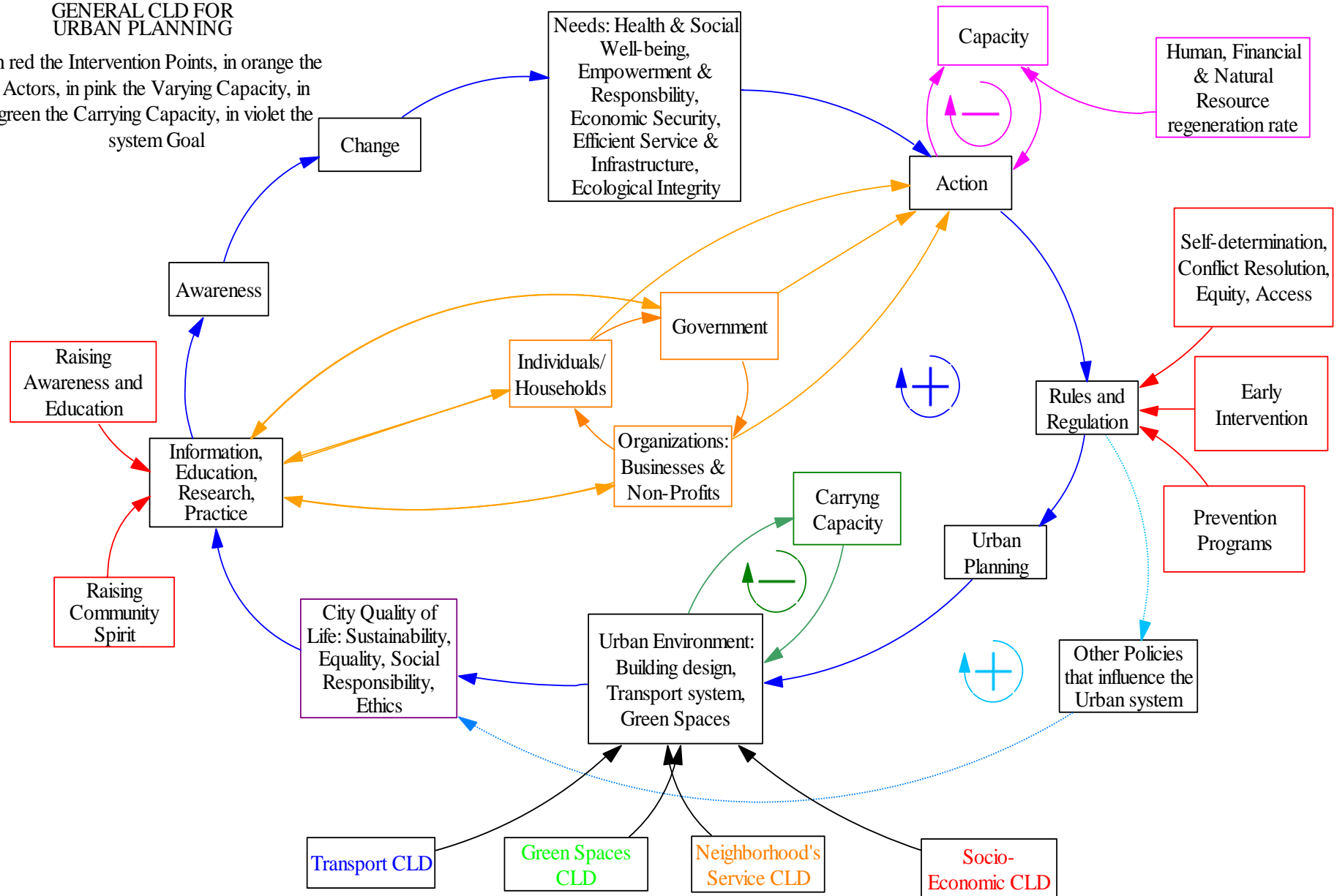
quaternary economic sectors, whose „products“ were essentially services and cultural goods that brought along new values.

Already 30 years ago we heard concepts such as *Livable cities*, promoted by a set of actions i.e. increasing the walking areas, the improvement of public transportation, the fight against noise and air pollution, the reconsideration of the center-periphery dialectics, and the quest of „reinventing a new patrimony“, even at the cost of economic growth, that is the increasing of the GDP. Unfortunately the above mentioned new social paradigm that should have been at the base of the urban reform (or regeneration) was not strong enough and did not change the overall rationality that created (and kept on shaping) the post-industrial cities. The consequences are that today, 30 years later, we are still facing the same problems, and we are still searching for a durable solution for a more sustainable city with an improved quality of life.

On the other hand, fortunately, today the new generation of urban society, already reached the fulfillment of all the material needs and is putting strong pressure on policy-makers in order to fulfill all the social and moral needs as well. Moreover, some of the fundamental elements of the quality of life, such as health and safety are clearly perceived as deteriorating, increasing the pressure for finding definitive solutions: in few words, now it seems we have reached the *momentum* for a systemic change in Reykjavik urban planning.

GENERAL CLD FOR URBAN PLANNING

In red the Intervention Points, in orange the Actors, in pink the Varying Capacity, in green the Carrying Capacity, in violet the system Goal



THE GENERAL CLD FOR SUSTAINABILITY AND QUALITY OF LIFE IN URBAN PLANNING

Having defined the notion of Sustainable City and Quality of life in urban environment, here we are attempting to create a Causal Loop Diagram linking together the most important components of the system. While the correlation between components (cited in bold and square brackets) is described, it is also giving a short explanation about the rationale behind their choice. How the improvement (or the deterioration) of the sustainability and the quality of life of an urban community come about?

Loop description

Having defined the *goal of the system*, that is **[City quality of life: sustainability, equality, social responsibility and ethics]**, we included it in the causal loop and we begin the description of the diagram from the *driving force* of the system: the **[Needs - classified in four major categories - Health and social well-being, Empowerment & responsibility, Economic security, Efficient Service and infrastructure, Ecological Integrity]**. From this we start the journey linking the need to the call for actions. **[Action]** represents the pressure on, and the opportunity for the Governments at all level (Local, Regional, National) to intervene by changing, promulgating and applying new **[Rules and Regulations]** for **[Urban Planning]**. The call for actions can come from each of the three main groups of actors **[Individuals/Households]**, **[Organizations: Businesses and Non-profit]** and even from within the **[Governments]**. The intensity of the actions called for (or proposed to) the fulfillment of the needs, are regulated by the rate of the **[Capacity]** of three crucial elements: the **[Human, Financial and Natural Resources]**. This balancing loop introduce the concept of sustainability within this causal loop. Just to explain this concept we can use the construction of residential buildings as an example: if the system does not take into account the human regeneration rate we might observe lack of housing (or too much offer), if the system does not recognize the financial limits we can experience the construction market bubbles. As natural resources here is meant those resources which can be regenerated. Land use instead is taken separately in a second balancing loop because it has different characteristics.

The call for the fulfillment of needs, the initiative of the actors, and the regeneration rate of the resources, are the three components that influence the introduction of new **[Rules and regulations]**

in urban planning and the change of the existing ones, which will help the system to meet the set of needs. This is the natural point of intervention for more general leverage points such as **[Self-determination, Conflict Resolution, Equity, Access]**, **[Early Intervention]**, **[Prevention Programs]** (Hallsmith, 2003). Here we can include not only the set of regulation for designing and planning an urban area, that is the set of parameters which architects and engineers have to follow, but also other set of „custom“ rules that individuals and organizations are following, often with the belief of its obligations.

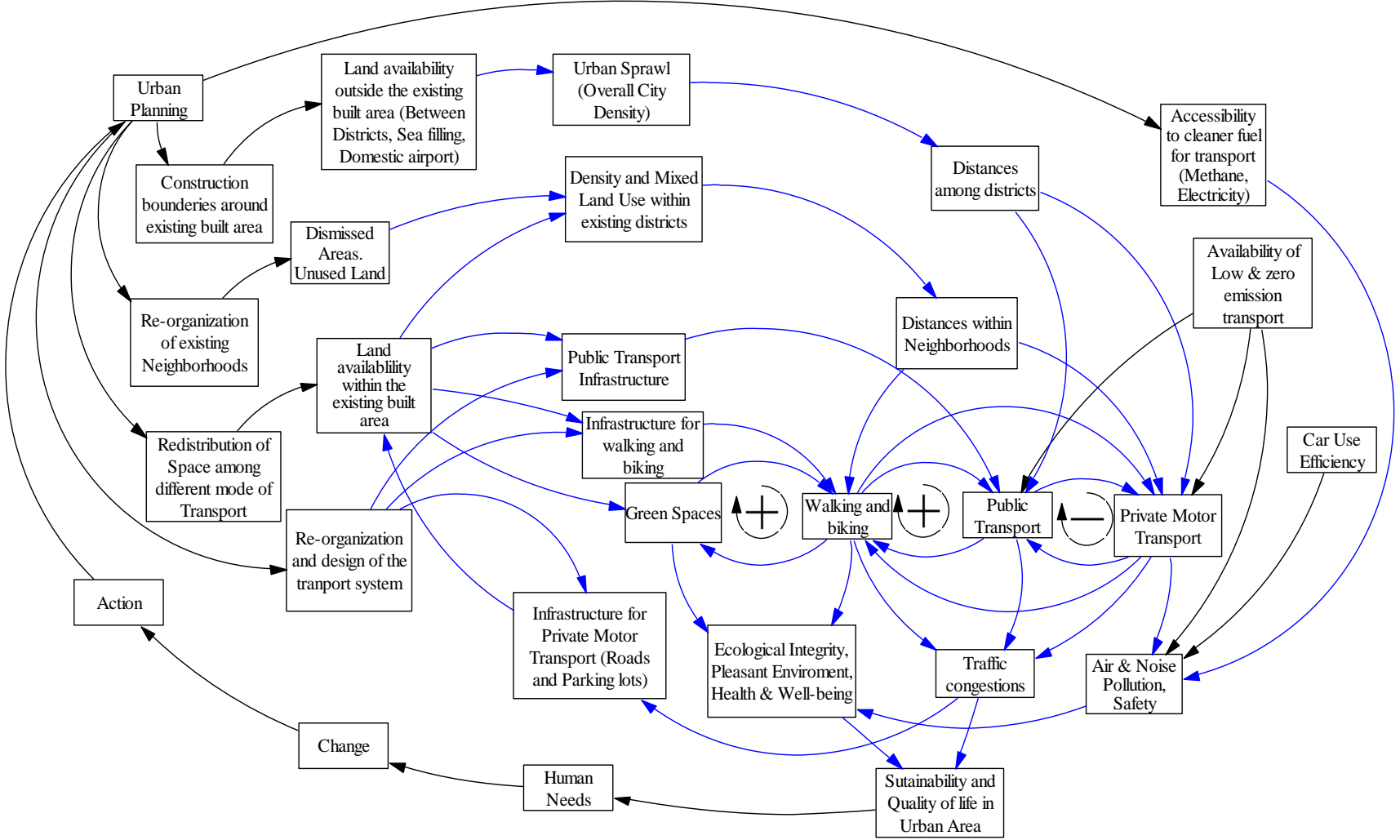
The change in the set of Rules and Regulations have great influence on the **[Urban Planning]** which is the crucial tool (but not the only one) for transforming the urban community into a more sustainable one improving its quality of life. Here in fact we wanted to remark that the three are **[Other policies that influence - the sustainability of an - urban system]**, not directly related to urban planning.

The Urban Planning, that aims to design, re-organize and manage the Built environment, is in our loop linked to the **[Built Environment: the Building Design, the Transport System, and the Green Spaces]**. This is the component that are dissected and described with four other CLDs (Transport, Green Spaces, Socio-economics aspects, and the Neighborhoods' services) In there are concentrated also several leverage points explained in the appropriated CLDs, which are aimed to improve the **[City quality of life: sustainability, equality, social responsibility and ethics]**.

Another crucial correlation in this CLD is the one that links the quality of life and component named **[Information, Education, Research, Dissemination, Practice]**. The correlation is quite obvious: when the Quality of life that includes, sustainability and especially equality, social responsibility and ethics, this does have influence on the above mentioned components.

And the Information component is crucial because it triggers the **[Change of Mindset]** through **[Awareness]**. Also in this case the three main group of actors, interact to raise the Education Information and to build the Community Spirit.

The loop is therefore closed when the change in the individual and community needs come about. The change of mindset is one of the most effective place to intervene in a system, as the Mindset of a paradigm sets up the goals, structure, rules, delays, parameters of a system.



TRANSPORT

Transport System CLD

The first Causal Loop Diagram describes the correlation among different components that forms the Transportation system of Reykjavík Capital area.

During the 1950's the Icelandic urban planners, due to historical reasons (Europe reconstruction after the WWII) studied in U.S. university and brought in Iceland the typical American modernist urban planning and began to design Reykjavík focusing on private motor cars. This pattern of thoughts crystallized into a path dependency which is today very difficult to change.

The deep imbalance between the private transportation and the other modes of transport, decades after decades provoked the typical system trap also known as „Success to the Successful“ leaving to the other mode of transport only a small fraction of the urban land used for private transportation, that is, streets and parking lots, and monopolized the mobility of the Icelandic citizens.

Urban land use for transportation infrastructure together with the urban sprawl, together with the design of both transportation system and residential districts accentuated the motor car dependency and the lack of diversity in mode of transport. Known are the consequences of this paradigm on the city sustainability and on quality of life.

How did the Reykjavik capital area transport system develop and what are the points of intervention to for creating a more sustainable mobility which positively effects the city quality of life?

By describing the causal loop diagram it is possible to answer to this question (The components are cited in bold and square brackets).

In this diagram only the most significant correlations are shown. The simplification was necessary in order to make the diagram readable and useful.

The core of the system are the three groups of modes of transport the **[Walking and biking]**, the **[Public transport]** and the **[Private Motor Transport]** related one another by a reinforcing loop between the first two and a balancing loop between the latter two. **[Green Spaces]** is also an important aspect in this system as they incentives the city walkability therefore it relates with a reinforcing loop with walking and biking.

The **[Distances within neighborhood]** and the **[Distances among districts]** influence the choice of the mode of transport putting in direct competition respectively the walking and biking with private cars, on one hand, and between the public transport and the private motor cars on the other. The distances are the direct consequences of **[Urban sprawl]**, and the **[Density and the Land Use within districts]**. These aspects are directly influenced by urban planning decisions on both the type of use and the urban design of **[Land available outside the built area]** as well as the **[Land available within the built area]**. In similar way, the three categories of transport modes, are influenced on the **[Public Transport infrastructure]**, **[Infrastructure for walking and biking]** and the **[Infrastructure for Private Motor Transport - Roads and Parking lots]**. Also here the distribution of land use among these three categories of transport systems infrastructure and their design influence the overall city mobility.

On the user side of the diagram, we have established that more use of private transport increases **[Air and noise pollutions and Safety]** issues, as well as **[Traffic congestions]**, while the increasing use of the other modes of transport, by eroding the supremacy of private transport in total trips, decrease the traffic congestions, the impact of mobility on the city's **[Ecological Mobility, Pleasant Environment and Health and Well-being]**. The above mentioned components have direct influence on **[Sustainability and the Quality of life in Urban Area]**.

Another important causal loop observed in this diagram is the one that goes through the correlation between the traffic congestion and the infrastructure, that is, considering the existing problem-solving rationale: the increasing of traffic congestions - not faced through the balancing loop among the other modes of transport - is solved by the „improvement“ of the Infrastructure of private transport, which erode the land availability for walking, biking and public transport, provoking another turn around the loop that deepens the problem instead of solving it.

This system behavior creates dependency or addiction, because the solution cures the symptom but denies the underlying problem, which is the supremacy of private car in Reykjavik transport system.

In the Causal Loop Diagram it is mentioned also the **[car use efficiency]** which does reduce the impact on emissions (fuel saving driving does) and partially also on traffic congestion (car sharing). The **[Availability of zero and low emission cars]** and the **[Access to cleaner fuel for transport]** have positive impact on pollution but does not influence the safety and the traffic congestion issues.

Suggested actions through Urban planning

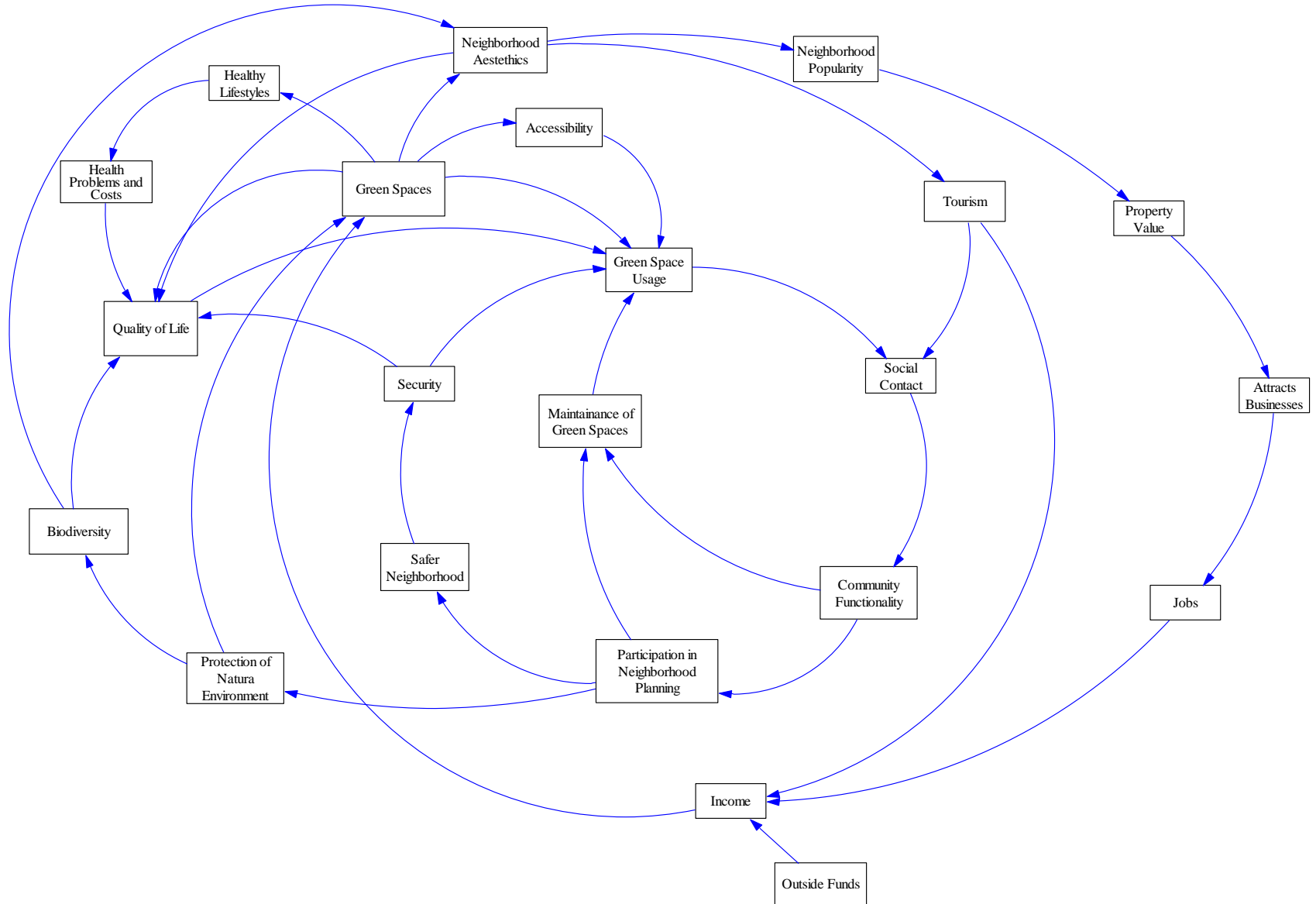
Urban planning has a key role in modeling the transport system. The suggested actions are:

1. The creation of a Construction Boundaries around the existing built area would halt the land availability outside the city border and consequently the problem of urban sprawl and at least not increasing the travelling distances.
2. The reorganization and the design of the existing neighborhoods focused on increasing residential density, increasing the mixed land use, and in terms of increasing the internal connectivity, would have positive impact on walking and biking which consequently would have positive impact on public transport. This of course would work if the density would be increased without having negative impact on the overall streets' image (therefore with building with 5 floors or less) and without reducing the green spaces.
3. When the above reorganization is made not only by restructuring the dismissed areas and the unused land within the existing neighborhoods but also (and especially) by building on the enormous amount of land that today is used as parking lots, would amplify its positive effects, reducing the travelling distances within the neighborhoods.
4. Do not begin the densification of the capital by increasing the built area until all the previous three actions have reached the carrying capacity and the real demand of housing (and not the financial speculation) is pushing the city to provide new housing.
5. The reorganization of transport system is a major action. This can be done by the following actions:
 - a) Building a public transport hub in the area located between the corner of Hljómskálagarður and BSÍ. The hub, strategically located among three major service areas (Downtown, the National

Hospital and the University of Iceland) would be the central station that every national capital has, and it would connect together Urban, extra-urban public transport, Neighborhoods' buses, Inter-districts bus ring, the downtown/University shuttles. The location of the central station in Hlemmur is considered as limit for the doubling the bus system because the station reached full capacity and is not scalable. The new hub, instead, would be easier to access by walkers and bikers and it also would host...

- b) ... the terminal station of the Rapid rail transport which would connect the heart of the Capital with Mjódd, Hafnarfjörður, Keflavík Airport and the village of Keflavík. In order to increase the efficiency of the railway, is possible also to..
 - c) ...move the domestic flight transport to Keflavík airport but only at the condition that the railway is first fully operating.
 - d) Taking one lane on Sæbraut, Miklabraut, Kringlumýrabraut, Reykjanesbraut (between Hafnarfjörður and Mjódd) and dedicate them for a ring bus loop (on both direction) which would provide a rapid connection among different districts and different municipalities of the capital area.
 - e) Increasing the diversification of fuels for transport (methane, electricity) by providing that each neighborhood would have a methane filling station, and a certain amount of public charging posts for electric cars.
 - f) Doubling the bus fleet and renewing the fleet with methane and electric buses operating accordingly to the different type of connection (rapid, neighborhoods, downtown shuttle)
6. Redesign the infrastructure of the capital transport system, making it more walking centered. It is crucial to integrate these actions with the promoting policies in other fields than urban planning (fuel taxation, incentives, neighborhood society, rising community spirit etc.).

GREEN SPACES



Green spaces CLD

This Causal Loop Diagram describes the components that form the Green Spaces and more importantly green space usage and how they improve the quality of life in an urban setting.

Parks and open spaces are again being recognized as an important element in people's quality of life and is increasingly accepted as a contributor to the sustainability of towns and cities (Gordon and Shirley, 2003), as well as transforming the environment, and attracting inward investment. They offer privacy, security and the opportunity for individuality. The living mosaic of urban green space is essential to the livability of towns and cities. They provides a soft and sheltered setting for the buildings and in addition, they are now being recognized as highly functional (Jones, 2003). Therefore green spaces have a range of positive benefits.

The loss of green spaces as a consequence of urbanization through the decades challenges us to consider the importance of urban nature more closely. Although urban nature, in the industrialized countries, is not typically a livelihood resource to residents, it does provide essential ecosystem services, including direct use, as in environmental, recreational and psychological services, and in a wide array of educational and social services. Local participation with regards to urban nature has the potential to enhance the sustainable development of communities and their green environments, especially if participants connected to the green spaces become integrated in planning (Azwar and Ghani, 2009). The literature has recently recognized the importance of such participation, perceived as one dimension of linking ecological and human social systems to guide sustainable urban land use planning (Azwar and Ghani, 2009). Functionality and accessibility are key consideration in the design and layout of urban green space. It is something of inconsistency that "nature areas" need careful design, planning and management in order to make them both interesting and accessible to the user. The invitation to use such spaces needs to be explicitly made and supported with appropriate site stewardship and supervision.

What are the main components that drive the usage of green spaces and how do they improve the quality of life and sustainability in urban setting?

Green space in this context, should include both public and private open space, more specifically, green space should include, but not be limited to: parks, lakes, creeks and other natural areas. There are many other “kinds” of greens spaces in Reykjavík. For instance, green spaces along roads and between them. Those areas should not be counted as green spaces in this context, and can be in fact, problematic.

This simple diagram shows the correlation between components that drive green space usage and how various components affect it. It can be use both on a city wide scale and in local neighborhoods within the city. If used on a neighborhood or a district, one has to have in mind that financial factors are taken into account, meaning the neighborhood could have its own financial aspect. The income of funds and increase in job opportunities for example should be on a „neighborhood“ scale as in jobs within that selected district.

As mentioned above, **[Green Spaces]** have an important role in neighborhoods and on a city wide scale. They bring invaluable elements to the otherwise grey and pale city landscape. Attractive, clean and **[Aesthetically pleasing Neighborhoods]** are essential to healthy neighborhoods, to maintain the neighborhood as a desirable place to live. Green spaces and general vegetation increase aesthetics and promote prosperity by stimulating **[Neighborhood Popularity]**, and therefore **[Tourism]**, raising nearby **[Property values]**, which benefits both owners and the local government. Attractive, well-tended green space can even serve as a redevelopment tool in weak or failing neighborhoods since it tends to attract private investments and with the help of increased property value, **[Attracts Businesses]** into the neighborhood, and therefore increases **[Job]** opportunities for the residents. For a semi-sustainable financial neighborhood or district those jobs can improve the **[Income]** with help from **[Outside Funds]** to create and improve green spaces within. Green spaces consequently encourage **[Green Space Usage]** as we move into the user side of the diagram. **[Accessibility]** to open spaces and natural environment is critical for the community’s wellbeing. Accessibility can stand for distance to an open space or how you get there, which again encourages green space usage. Green spaces also help develop strong communities by contributing to mental wellbeing and by binding people together through their public space. Green spaces draw people

outside and fosters **[Social Contact]** where people can gather and opportunities for positive social interaction and supportive friendly environments take place. With **[Community Functionality]**, where the residents become more aware of their surroundings, neighbors know each other's and care about their place of living, the community strengthens as a whole and starts making decisions to foster their nearest environment with **[Participation in Neighborhood Planning]**. When residents have more vested interests in a place, their participation in community vigilance increases, and they will watch to make sure it's not being misused, damaged, etc. The better **[Maintained Green Spaces]** or public space is, the safer it is going to be. Therefore green spaces promote **[Safer Neighborhoods]** and more general **[Security]**, which is an important factor in **[Quality of Life]**. Recreation activity is important to personal life satisfaction and those who participate in recreation are notably happier. Those who recreate more often are likely to be completely satisfied with their choice of careers, friends, and their perceived success in life. The evidence strongly suggests that participation in outdoor recreation, particularly as a child, leads people to have more satisfying and fulfilling lives. Recreation activity is a medium in which participants can change their self-image and gain personal satisfaction. Green spaces therefore actuate **[Healthy Lifestyles]** with reduction in **[Health Problems and Costs]** which is one of the most important factor in **[Quality of Life]**.

Improving green spaces with local governments, local communities and urban planning

The issues with green spaces in the Reykjavík area are many. Reykjavík has many open spaces and some of them are very large. The Citizen's needs for open spaces were first recognized in the beginning of the 19th century by Guðmundur Hannesson, a medical doctor and an urban planning pioneer, with his book *Um skipulag bæja*. With his plans for Reykjavík, he ensured that the balance between buildings, streets and green spaces were fair and every citizen was able to travel a minimum distance to a green space. Today, those values hold for the most part, however, green spaces and other recreational areas are often misplaced, unevenly distributed and lack proper maintenance. Further, the huge spaces along and between roads contribute to nothing but to take extra space. Accessibility is another problem. Badly planned walkways and high fences are common, buildings are misplaced and the entrances always lead to a big grey parking lot. Clearer vision by local governments and urban planners is badly needed. This holds especially true in the three neighborhoods presented.

Local governments, urban planners and local community residents should follow a joint vision statement that encourages local participation and makes effort to create a better environment and improved green spaces. These efforts will include the researching of the latest trends, the assessing of community needs and interests, the ongoing evaluation of all operations and the utilization of best practices in order to provide a healthy quality of life in our ever-changing community. The citizens of Reykjavík value open space and that value is reflected in higher values for properties located in close proximity to open space amenities.

Local Government should take that value into account in land use decision-making, but are not always able to do so. Decisions-makers who understand the value of open space will be more likely to take the time to assemble the tools needed to implement their open space plans before priority lands are developed. They will pass ordinances and a land protection plan and will invest in a land protection fund. It is often hard to fully reflect the value of open space in the financial analysis underlying local land use decisions. The pressure for the development sometimes makes communities commit to development before they implement comprehensive open space plans, especially in areas at or beyond the urban fringe.

SOCIAL AND AESTHETICS

Density on the premises of promoting sense of community and aesthetics as a prerequisite for quality of life and sustainability

A **sense of community** refers to people's perception of interconnection and interdependence, shared responsibility, and common goals etc.

A local community is a group of interacting people sharing an environment. In human communities, intent, belief, resources, preferences, needs, risks, and a number of other conditions may be present and common, affecting the identity of the participants and their degree of cohesiveness.

Aesthetics is about how the urban landscape affects you spiritually, it is about the quality of the experiences you get from it and therefore it adds to the quality of life. As Arnold Berleant puts it „aesthetics in the urban context is about including aesthetic engagement into humanizing the urban landscape. Aesthetic engagement is thus a value that can be deliberately incorporated into the design of environmental experience, and it can serve as a guide in reshaping and humanizing the urban landscape. “(Berleant, 2007). When the urban environment can extend your imagination, put the cultural heritage into a context and give you a new insight, then the aesthetics and the environment are working together. The aesthetics is the heart of everything that gives life a meaning (Berleant, 1992).

Interactive public participation and sustainability

To involve the public in is a part of the planning process. Being able to take part in decisions regarding ones local community or neighborhood as a part of a planning process is a key to a democratic decision making in a sustainable manner. It strengthens the local community and sense of awareness amongst the residents. You also have to feel as if your **[comments and complaints]** are listened to and taken seriously. How many comment there are and how they are dealt with says a lot about how successful this participation process has been **[(authorities positive response means changes in the plan)]**. Those who feel that their comments are taken into consideration and they

have had [influence on decisions regarding the local community]. That affects [activity and empowerment] as they will most likely become more interested in their local community, to be active and influential regarding their local environment. It will affect their [accountability] to the authorities and get a stronger [sense of community], affecting [quality of life] and [sustainability]. [Activity and empowerment] will affect [tolerance] and [prejudice] as they will need to come to a preferably win-win solution and that means considering other peoples, needs and preferences too and the needs of the community as a whole. [Prejudice] will affect [crimes] and [security].

Intervention: People will learn about the importance of having influence on your neighborhood and the whole city. We are all responsible and should therefore take part in decisions regarding our environment. The local people often know what is best for their own neighborhood and how to prioritize. Neighborhood council with independency in decisions regarding their own neighborhood and promotes the residents empowerment and participation. It can also increase that people take part in work and actions they consider important.

Interactive participation and increasing density in the urban area

If interactive participation goes all the way to a [„answerability“] or „responsibility“ as Viðar Hreinsson puts his speculation „Pæling um vettvang“ in a lecture held in Arkitektafélags Íslands the 14.th of April 2011. He talks about that it is in the states interest that its residents are inactive, like a gear wheel in a machine, because the specialists are meant to think for them, but they entrench inside the system and divide and conquer without „answerability“. There is a lack of professional discussion and coherence with community and cultural matters and taking a stand to issues concerning urban planning and architecture. He asks if architects are active, participating and creative in the formation of society or passive sellers of service and says *“A class that is controlled and has everything under the capitalism, contractors and buyers, and still holds some responsibility towards the appearance and of community must have a broad intellectual, cultural forum, to build their own identity or self-awareness, and also a dialogue with the community that it is responsible for.”*

This „answerability“ where everyone, public officials, professionals the „creative class“, the public and practice [creative thinking] have a discussion on where we want to go in a responsible way and in purpose of finding new **[innovative solutions]** to our problems that will lead us to taking **[social cohesion]** and **[aesthetics]** in the urban planning process and the design of urban form and buildings. We need to know what has to be included in design that supports community and aesthetics and the landscape and cultural heritage has to be considered and taken into account.

Planning and design supporting social cohesion and aesthetics

[Urban form - height, scale, mass -] Human scale considerations needs to be taken into design in estimating the preferred density. Increasing density in an existing urban area both affect and change existing built landscape and cultural heritage and needs to be taken into consideration in the planning process when preferred density is decided. **[Enclosure and interface]** between the buildings and the space between /around them is affected by urban form and affects **[microclimate and security]**. **[Microclimate -]** supports shelter from wind, noise and gives ideal accessibility to sun. Urban form influences as the layout of the buildings affect enclosure and interface. Enclosure and microclimate affect the **[number of people using the areas]** and that affects **[people interacting]**, which affects **[security]** with each other and affecting the areas **[livability]** which affects **[sense of community]**.

Urban form and architecture can be used to reduce crimes as it can be reduced with architecture and planning. Good visibility and lighting makes it difficult not to be seen. Blank walls and blind corners along walking paths should be avoided. External spaces should be well integrated into developments. Physical and psychological barriers in design that makes clear that when entering a private area. According to Putman (Putnam, 2000) has community engagement been proven to increase amount of social capital as it has been shown to reduce crime (Putnam, 2000) Design that has aesthetics as one of the main goals affects how landscape and cultural heritage is taken into account when planning in existing built areas. Areas that are aesthetically fulfilling are likely to attract people and that affects people meeting each other and using the areas. Design that supports sense of community will promote layout that promotes interface between the buildings and the spaces around them. More interface will affect people interacting . That can affect people using the area as you might want to

sit down enjoying a good weather, meet your neighbors or your children might want to play with the other children in the playground. People that meet on their way to and from the apartment and need to cross each other on their way to walking paths or parking are more likely to connect and that increases the sense of community.

Density and urban form - walkability and livability

[Urban form] also affects **[diversity in urban form and architecture -]** as it will be likely to contribute to a **[pleasant and inviting environment]** together with **[accessibility]** and **[distances]** which will affect **[walking]** as people are more likely to walk to services, groceries, schools or using the **[walking]** paths for walking for joy or recreation. The more people walk the more they **[interact]** which affects **[security]** and **[livability]**. Feeling of **[security]** affects people using the outdoor areas. Pleasant and inviting environment also affect **[physical activity, healthy lifestyles]**, and **[psychological wellbeing]**.

If human scale is taken into consideration in the designing process it affects physical and visual distances as the human scale does not allow for relatively big houses and high rise buildings. Having short distances to the outside area and visibility will increase the number of people using the area as it will promote security to children. Walkability in aesthetically pleasant, secure and inviting environment to services such as schools, groceries, recreational facilities, health care, social and cultural institutions will promote walking and affect the use of car. It will make the community more secure and livable, which will strengthen the community cohesion.

Diversity in urban form, flexibility and residential diversity

[Flexibility] in design for entire life course, changing lifestyles and for diversity affects stability as you have the possibility to **[adapt]** even if there are changes in the family structure. **[Migration]** will be affected in a community where quality of design and aesthetics is part of the environment as you will be reluctant to move and if you do you will be likely to move inside the community. That affects property value and economy. Having **[residential diversity]** affects **[social mix and cultural**

diversity] as people in different ages, with different cultural roots and different classes can live together which will affect **[equity]** and **[crime]** as feeling inferior is likely to promote anger and dissatisfaction which will again affect **[psychological wellbeing]**.

Activity, empowerment and psychological well being

Active people/residents working together to better their own surroundings affects **[tolerance]** and that affects **[prejudice]** which affects **[crime]** because everyone is allowed to take part and learn to know all kinds of people with different cultural basis and different ages and with different opinions. The feeling of being part of a group working together affects **[crimes]** along with **[equity]** which stems from having **[cultural diversity and social mix]** among residents.

Intervention: In Iceland, apartments in private ownership are much more common than rented ones. The only rent/buy-rent apartments are from Búseti. They prefer to build in larger units. Rent apartments are mostly private properties and are therefore totally controlled by the owner. Social rent-apartments are owned by the state or city and have a social stamp on them, and that the people living there are troubled people. In order to have mixed neighborhoods they have to include all of the above residential options, be a cross-cut of the society and in line with sustainable emphasis on social justice. There, cultural and economic diversity has to present.

Other suggested intervention: Changing the urban system from bottom-up

As said in the previous paragraph, if we want to make remarkable changes in Reykjavík urban planning, changes that would increase the individual and the collectivity quality of life, we must begin to change the rationality behind the existing urban system. The biggest mistake would be to superficially modify some urban areas, for example Skeifan, without changing the patterns of thoughts which generated it. One of the solution suggested here, the most important one, is to involve as many people as possible in improving the quality of life of the neighborhood they live in. Public participation is crucial not only because it implies a democratic decisional process, but also (and especially) because it strengthens the changes, building up the paradigm on which is based.

It has been written in a report on the importance of the distribution of power and the political decision. The regeneration of a new urban system from bottom-up would be possible by establishing a sort of public and non-profit association in each neighborhood, which has the goal of improving the quality of life of the neighborhood, by monitoring the ecological-footprint of both public and private spaces, managing the sidewalks, the biking lanes, and the green spaces (controlling their state, quickly providing to their maintenance, cleaning, shoveling, lightning, patrolling and assisting their users). The *neighbor's society* would promptly assist the citizens and also gather the suggestions for improvements from its citizens, and forward those suggestions which imply major changes to the municipality (i.e. the introduction of new bus stops/routes, building new biking lanes, improving sidewalks heating system, promoting tree planting, suggesting a more profitable use of urban land by re-qualifying the spaces occupied by parking lots, introducing of new economic activities, etc.). The neighbor society would incentivize activities which would diminish the ecological-footprint of the neighborhood, such as the installation of bike-parking grids, charging-post for electric cars, methane fuel station, or the door-to-door collection of plastic, glass and paper waste, or organizing the several street-flea- swap/market, biological gardening, and sale of biological/fair-trade products, managing the neighbor's time bank, etc. The neighbor society would also incentivize several cultural activities such as exhibitions and social gatherings (i.e. sport, music, etc.).

In the last decades the pursuit of the right of privacy (private property, private car), generated also the opposite need, the one of social life. We perhaps went too far, and we found ourselves often alone in our private apartment and in our private car, and we don't know even the name of the people living across the street (who is probably drives alone the car behind ours, probably going in the same place as us) and all these distances sometimes creates also suspicion and paranoia. The creation of a *neighbor's society* would partially correct and balance the need of privacy and the need of social life, by improving the use of public spaces within each neighborhood and among them.

In this way in each neighborhood we would create (revitalize) a sort micro-society, we would increase the personal connections within the area we live in, creating a sort of collective identity, based on reciprocal respect, responsibility and enjoyment of the public spaces. All this would increase of course also the perception of safety.

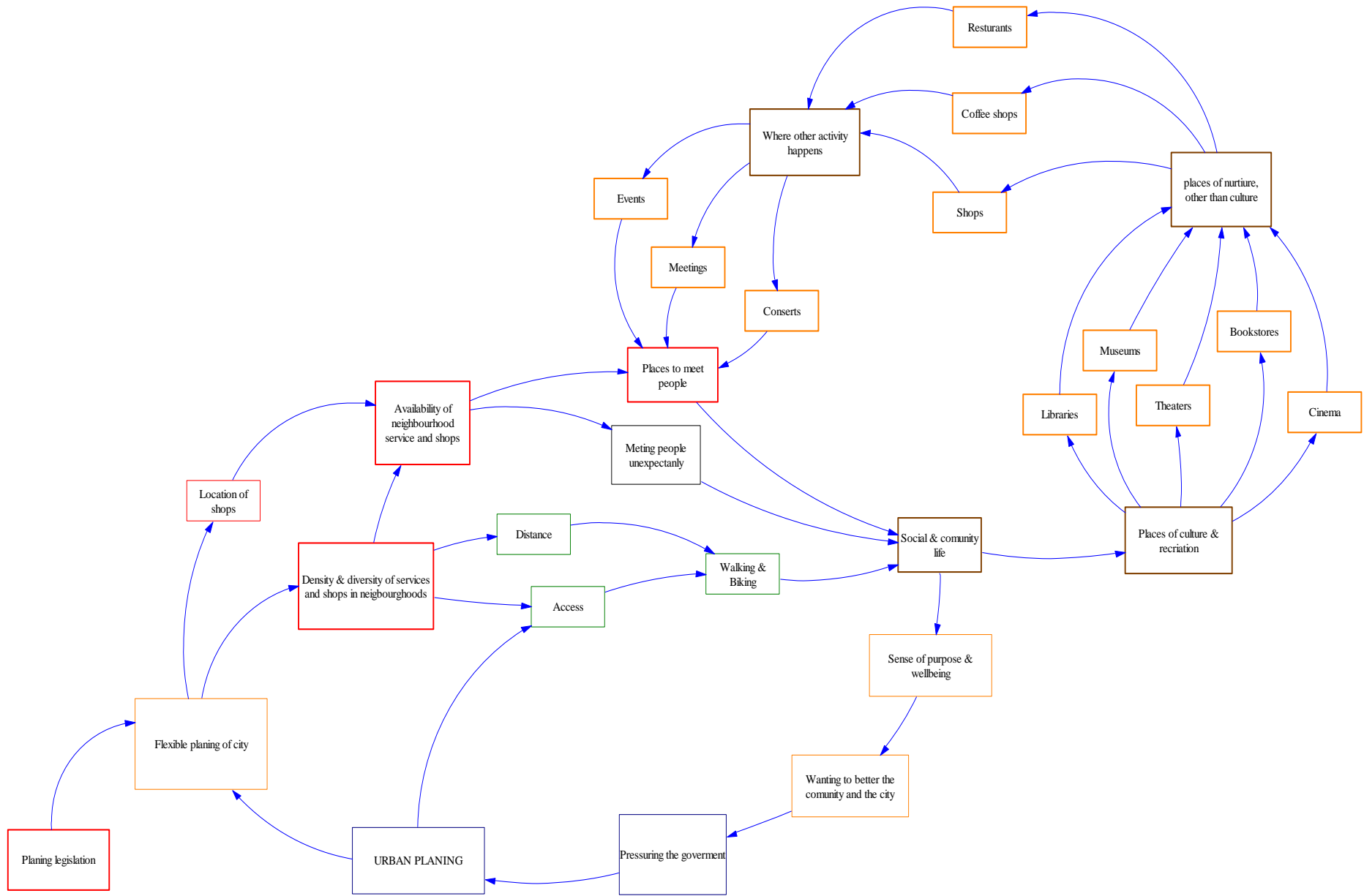
Indeed the individual privacy would still be an important aspect of our life. Improving the quality of life through the establishment of the *neighbor's society* we would just prevent the right of privacy from becoming overwhelming, transforming itself from our indisputable right to our self-made cage.

Increasing the human density

Where to intervene and how to increase the human density in Reykjavík? It is definitely not a good idea doing it by building in areas such as Vatnsmýri or by creating new urban spaces by filling the sea-coast. In this way we would just produce another district with the same low density of the existing area. Then the other solution is to build in existing built area. Here we have to answer to the question: how? Because it is very important to take care of the street image, and also to assure the solar exposure of the streets, therefore vertical construction, with buildings with more than 4/5 floors, is not the right answer. In the existing built urban areas there is land that today are used as parking lots, other areas commercial areas that could be more efficiently used and transformed in mixed districts (i.e. Skeifan). These areas are sufficient to increase the density (in both terms of residents and users) of Reykjavik by 15%, without contributing to further urban sprawl and without eroding green spaces inside the urban area.

It might be argued that in 10-15 years the pressure of new housing demand in the capital area will be stronger again, calling for further city expansion. To this hypothesis is possible to answer by transforming the capital area's satellite villages (Keflavík and Grindavík, Hveragerði and Selfoss, Akranes and Borgarnes) in optimal residential options even when the economic/social activities would reside in Reykjavík. This is possible by connecting these villages with the capital area with faster and reliable public transport. The suggested first project, the most important and most necessary, would be the rapid-train connection between Reykjavik and Keflavík Airport. The village of Keflavík/Njarðvík could actually be also connected and could act as rolling stock depot management. The socio-economic benefits for Keflavík/Njarðvík would be enormous (10 times more than an aluminum smelter!) because people could decide to reside and live in Keflavík although part of them would need come to the capital for their working/social activities. A train that would connect the downtown of Keflavík with the downtown of Reykjavík in less than 20 minutes, in complete comfort, would increase the value (both economic and social) of Reykjanesbær and decrease the eventual demographic pressure on the capital area.

Increasing the density of a certain urban district it does not only mean increasing the number of people residing in the area. It means also increasing the number of users of that area. Therefore it is important to increase the number of job opportunities which provide services and demand of new services, contributing to the increasing of the number of users of that area. In this respect also the accessibility of the capital area's urban districts are also very important. Increasing accessibility means increasing the possibility to everyone to access a certain area, and this is done by diversifying the mode of transport and multiplying the possibilities, not only by lowering the time from going between A and B.



SERVICES

Services of Reykjavík city In our project we aim to identify the components of urban design which is to discourage the sustainability and quality of life in urban planning with CLD. With CLD we can see what variables affect other variables and where you can intervene and where not. The factors that our group found most important in terms of sustainability in urban planning turn to the way we travel in the city. But the trip may vary depending on the errand. This section discusses the neighborhood services. Neighborhood services in Reykjavik varies by neighborhoods. It is possible to see a big difference in the structure in neighborhoods depending on the year they are planned. There are some basic services in all districts of Reykjavik, which can be divided into several categories. These categories are: • Education • Sports • Leisure / entertainment • Grocery stores • Medical Services and Education is divided into: • Preschool • Primary schools • High school • Special schools Sports are divided into: • Playgrounds • Leisure center • Sports area Leisure / entertainment are divided into: • Library • Churches • Community center. Grocery stores are divided into • Grocery • Pharmacy • Bakery • etc.

If the neighborhoods Austurbær, Háaleit and Breiðholt are examined based on the structure of neighborhood services one can well see how different these districts are in the distribution of services. To begin with there is much more diversity of housing in Austurbær related to service than in the other two districts. In one building there can be a store on the first floor while there can be an office and residential property on the upper floors of the building. This kind of different space usage in one building is not found in Háaleiti nor Breiðholt. What is also characteristic of Austurbær is the flexibility relating to modification of property for different uses. A building in Austurbær that has been used for years as an industrial property, commercial or offices can be changed to residential and vice versa if all is done as according to the laws and regulations.

The flexibility to change spaces as needed, makes the space for services not fixed in a particular area. This allows the service to be located near the customer. This presence can have a lot to say about how people travel in the city. The access to stores and services also play a big part into how people choose to travel around the city. As soon as the proximity between inhabitants in the districts and service is good enough to get people to choose the option to walk to the nearest shop or service, a certain kind of intimacy between the pedestrian and the environment begins that does not happen when people choose to take the car.

It shows in the difference between the response you get from people when you bump into it on the street and when you cut it off in traffic. When people get into their cars they lose the intimacy and the feeling for their environment. The intimacy begins as soon as you walk out of your home and navigate on foot or bicycle.

1.

Density & diversity of services and shops in neighborhoods can affect the room for service and shops in a neighborhood. The availability of neighborhood service and shops affects the numbers of places to meet people and there for affects the social & community life in the neighborhoods. The social and community life is important for people to feel a sense of purpose & wellbeing in their neighborhoods. When people feel they have a sense of purpose in their neighborhoods they are likely wanting to better the community and the city. That leads to people to pressure the government for improvements. That can lead the government to make changes to the **[urban planning]** and make the **[planning of city more flexible]**. The flexibility makes then room for more **[density & diversity of services and shops in neighborhoods]** and has therefore a reinforcing effect on the loop.

2.

The number of places to meet people affects the social & community life in the neighborhood. The feel of social and community in the neighborhoods can have effect on places of culture & recreation like libraries, museums, theaters, bookstores and cinema. These places tend to attract a lot of people and to be time consuming so people spend a certain amount of time there. That leads to places of nurture and other than culture like restaurants, coffee shops and other kind of shops to open for business in the same area if not just inside of the before mention businesses. Those coffee shops and restaurants then tend to be places where other activity happens like all kinds of events, meetings and sometimes even concerts that attracts all kinds of people and end up being places to meet people.

3.

[Density & diversity of services and shops in neighborhoods] can affect the **[distance]** between home and service that affects the choose of **[walking & biking]**. The choice between walking/biking and

the car can greatly affect the feeling of **[social & community life]** for people that then affects the **[sense of purpose & wellbeing]** of their community. If people don't have a sense of purpose and wellbeing in their community they don't feeling of **[wanting to better the community and the city]**. The feeling of wanting to better the community and the city leads the people to **[pressure the government]** for improvements in of neighborhoods. That can affect the **[urban planning]** and the **[flexibility of the city planning]**.

4.

The **[urban planning]** has a great effect on the **[access]** to services and shops in the neighborhood. It also affects the access of **[walking & biking]** that ultimately leads to whether or not people choose to walk/bike or use the car. That small choice can affect the feeling of **[social & community life]** in the neighborhood that leads to whether or not you have a **[sense of purpose & wellbeing]** in your community. That affects the feeling of **[wanting to better the community and the city]** that ultimately affects whether or not people **[pressures the government]** for improvements in the neighborhoods.

The difference between these three districts is how much people are active in their neighborhoods. It has been shown that people who live in Austurbær are being much more involved in their neighborhood than people living in Háaleiti and in Breiðholt. The closeness of the servises and the easy option to walk or bike in their neighbourhood makes the residents of Austurbær much more involved in the community.

THE THREE NEIGHBORHOODS

Háaleiti

The urban form in Háaleiti does not support sense of community, social connections and wellbeing. Residential areas are homogenous and characterized by four-storied buildings which are arranged regularly in several places in the area, three-storied houses, terraced and a few villas. Employment areas by Ármúli and Suðurlandsbraut count as a part of the neighborhood but make no connection to it. To increase the density and to utilize urban areas in a better way, does not have to be at the expense of green areas, though it is likely that the space will be reduced somewhat, but it will increase their quality. Quite a bit of green spaces are along roads that could be used and improved through better planning and even be used for noise reduction. The green spaces between the apartment blocks are badly utilized because of their size, openness and how badly they are defined. They are poorly connected to the houses and the entry to the blocks faces the parking lot, thus, you have to go around the block to enter the green spaces which serve as a residential community place for each building. It does not encourage their usage. The street space that consists of Háaleitisbraut and a side road to it, including parking lots, exceeds the capacity needed to fulfill demands for access and parking lots. This then, offers faster driving through. Both sides of the area consists of one school district. It would be possible to build alongside the street, athwart the apartment blocks and thus block them from the northern winds. New buildings can thus form a shelter against the weather, but a major prerequisite for the use of outdoor space in climate such as prevails in Iceland are strong connections between visual and physical, shelter from wind and noise and security and strong sense of space. This can however reduce apartment utilization, view, etc. It can as well be difficult in practice because of ownership and land leases. If systematic actions are to be taken in reducing city density and poorly utilized areas, you will need strong solidarity, courage and hard work to find ways to change building borders and compensate for possible economic losses. New ways have to be found to work comprehensive solutions based on new thinking and good cooperation with those who are affected by the project. There is no question that a successful reduce-density project in Háaleitishverfi, where quality of life is one of the goals, could strengthen the neighborhood and make it more sustainable. Shops and other services seem adequate. Diversity in population patterns and architecture needs strengthening, but it has to be done so that the human figure does not disrupt. Green spaces need to be connected with the houses in a better way, by moving the entry to face the

green spaces, and to encourage the residents to make the recreational areas more attractive. The space that the Háaleitisbraut consists of can be reduced significantly, and where it connects Miklubraut and Kringlumýrabraut together, it has to be changed so that it is perfectly clear in both ends that it is a residential street. Pedestrian networks across the street need to improve as well as walking networks and biking networks in general. These actions would affect quality of life of the residents as they would improve society in the neighborhood, improve environmental quality and aesthetics and ultimately have a positive economic impact because housing prices would rise.

Breiðholt

Upper Breiðholt is actually a well-organized neighborhood when looked at in a strategic way. It is difficult to look at the district as a whole, especially because of its size, as they are divided into smaller sectors to some extent, like Hólar and Fell. But what unites them all is the center area where all service one neighborhood requires gathers. Prejudice against Breiðholt have been around for quite some time but hold no place in reality. What stands in the way of Breiðholt is the population pattern that is at times very repetitive, as well as the apartment types. The land is unevenly divided between apartment types and population patterns. In few places, the human figure is totally disrupted with 8-9 storied blocks in a very unattractive environment, parking lots on one side and big lawns on the other. Many social apartments were built and probably due to economic or cultural reasons, mainly foreigners live there. The wealthier people all live on the border, with a great view over the many beautiful natural places around Breiðholt. Private villas have a special dead-end roads (cul de sac), and therefore don't have to make contact with "the common people". There are not even connections from those end-roads into the natural areas. Breiðholt is perhaps a typical community where there is separation between rich and poor. There are considerable potentials to increase density in Breiðholt, but it must be done in order to improve society, improve balance, improve the most poor areas, connect buildings with natural and recreational areas and make the spaces between the more attractive. There is no shortage of green areas and the nature is just a step away, with Elliðárdalur. However, the height of some of the buildings make sure that the environment becomes overwhelming, impersonal and spaces between houses poorly defined. It also seems that poor solidarity between the residents stands in the way of making their surroundings more attractive. Walkway connections are very good and all major services such as schools, sports facilities, swimming pool, church, social activities for the elderly, library and cultural center are all in the middle of the

area. Walkways are not so inviting in general, especially where they lie up to villas or terraced houses, where the homeowners fence themselves from the walkways so that empty walls lie on both sides. The main traffic street lies around the service area with many dead-end streets coming out from it. Breiðholt is a typical neighborhood brought up around 1970. To make it more sustainable and contain improved quality of life, the closest areas surrounding the buildings must be built up, form stronger and more defined spaces and improve the aesthetics of the neighborhood in general. Prejudices are likely to reduce the confidence people have on their environment which in turns inhibits the participation and function of the population. Cheap and social housing can attract those who are worse off in society and when the infusion is poor and the group is homogeneous, we are more likely to have a problem, physical well-being gets worse, crime increases and the safety of residents is threatened. Threat to security compromises the quality of life and it even makes people move as soon as it can. According to a residence survey, there were many that stated that they would never want to live in Breiðholt, and most of them lived elsewhere and had never lived there before. It would be interesting to know if any of them has ever even been there? It can be mentioned that in the same survey most people wanted to live in Vesturbær, but very few were interested in living in the houses there, as they were shown a picture of the houses.

Austurbær

Austurbær is a typical city area with diversity of services and cultural activities. It is therefore very different from Breiðholt and Háaleiti. Austurbær was planned before the car took over in planning and that characterizes the area a lot. Street pattern is different from most other parts of the city. Diversity in urban form and a mix of apartments, services and businesses. Increasing density the city needs to take the existing urban form, cultural heritage and landscape into consideration. Density in the city area should always have the overall goal to improve livability, security, attractiveness and include aesthetical considerations. New „old“ buildings should not be the solution but new buildings that respect the existing urban form and buildings. Overall discussion is needed where we ask the questions, what do we want and how are we going to achieve it, is something that is needed in Reykjavík city.

CONCLUSION

In our project we attempted to answer the question on how it is possible to improve the Sustainability and the quality of life of Reykjavik through Urban planning. The methodology suggested was System Thinking, a quite new approach for many of us. We first learned the basic tool of System thinking and then we learned to apply it to urban planning and the city environment with the scope to understand the complexity of the urban system, and the major correlations among a wide range of components.

We agree in the fact that this method suits well for analyzing the behavior of urban cities, because it includes tool very useful to understand the paradigm of the system, the mind-set, the rules, the feedbacks among variables, the stocks and the flows of its components.

We decided to split the CLD of Reykjavik urban planning into four uniformed subsystem in order to better explain the correlations among within them and among them. These were the Transport, the Green Spaces, the Socio-aesthetics, and the neighborhoods services.

These 4 CLDs interact and influence one another and consequently also the set of actions proposed are taking into account the whole system formed by these four subsystem.

Inside this diagram we recognized several system “traps”, mainly path dependence, but also other system deteriorating behaviors. These helped us to find a number of intervention points at many levels, feedbacks, stocks and flow structures and rules.

We then prepared another causal loop diagram to with the aim to explain the relations to and among the actors. This general CLD also helped us to introduce the concept of capacity, carrying capacity and regeneration rate of human, financial and natural resources which have big influence on the urban planning, quality of life and sustainability.

In this general causal loop diagram we found few yet very crucial intervention points: one side on the necessity to reform the set of parameters behind the regulations and rules of urban planning, on the other side, the most important intervention on information & education (we added also scientific research, dissemination and practice).

Raising Information and awareness are absolutely necessary actions at the base of system change, the most effective ones because they change the system paradigm, that is the mind-set out of which the system - its goals, structures, rules, delays, parameters -arises.

The combination of all range of interventions suggested in the previous paragraphs, (set of urban growth limit, major infrastructural transport changes, increasing density, connectivity and mixed land use within existing districts, neighborhoods' society management of the nearest urban environment, etc., on one side, and the raising of awareness through information and education on the other) would improve the quality of life and the overall sustainability of Reykjavík in the coming years.

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