

**PRAHA 07**

**THE TEJIDO GROUP**

**S.2015**

**CAPLA - UNIVERSITY OF ARIZONA**







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# PREFACE

## ACKNOWLEDGEMENTS

We have been fortunate enough to have had the opportunity to develop and implement study abroad programs on five different continents. Most recently we have worked in the Czech Republic, Mexico, Palestine, Hong Kong and Panama. This fall semester, for the second time, we offered a vertical, interdisciplinary and international studio integrated into the core curricula of three schools of design across three Universities. We developed interdisciplinary teams of highly selected students to participate in a compelling urban design studio and practicum in Prague. Three Universities participated: the Architectural Institute of Prague, Bilkent University in Turkey, and the University of Arizona. This project focused on the redevelopment of the post-industrial urban water front of district seven in Prague, Czech Republic.

The basic pedagogical intent of the program was to enhance cross-cultural and cross-disciplinary awareness, collaboration and learning in the students and faculty of Architecture, Landscape Architecture, and Planning of the three participant Universities. We trust that the processes employed and the community development solutions generated during this complex and multi-layered project will eventually gain relevance and bear witness in subsequent research and professional work of all student and faculty participants. It is also anticipated that participating students may discover likely thesis or capstone projects that could become extensions of their experiences in the Czech Republic.

Our time spent on this project in Prague seems to have catalyzed a better understanding of the potential influences and confines inherent in our design and planning professions regarding their ability to effect meaningful change in urban fabric. Cultural and professional commonalities have also emerged and have become increasingly apparent to all participants. Although urban areas in the Czech Republic, Turkey and the United States are vividly distinct across a range of criterion; all three



(ABOVE) Workshop at the Architectural Institute of Prague

participants must contend with an array of critical environmental and social issues, i.e. uncontrolled growth, economic stagnation, transportation inefficiencies, a dearth of open space and recreational opportunities, environmental degradation, as well as diminishing sense of place. Although cultural and political schisms are at times all too apparent, students and faculty in the allied design and planning professions do in fact share many common goals. And, we chose to focus this studio experience on perhaps the most important of these objectives: that of creating and revitalizing urban fabric envisioned and developed across a range of interrelated variables that are also their own measures of sustainability. Although we remain apprehensive regarding the use of the term “sustainability”, we do honor it as an elusive yet worthy goal integrated into all of our planning and design efforts. We believe that a truly sustainable urban environment must necessarily be defined across an array of dimensions: economic, cultural, environmental, functional, and aesthetic. Accordingly, in our more complex projects we evaluate the relative merit of our ideas according to the following design and planning ordering systems:

(RIGHT) The group of Bilkent University in Turkey and University of Arizona students with Mark Frederickson in old town

- **Economy;** is the design economically sustainable? Does it create jobs and income sources for the community?
- **Environment;** is the design environmentally sensitive? Does it connect and enhance existing ecosystems? Does it reduce our carbon footprint?
- **Culture;** does the design create opportunities for meaningful social exchange and learning?
- **Function;** does the design circulate effectively? Is it safe? Is it easily maintained?
- **Aesthetic;** has the design identified and created an aesthetic sensibility appropriate to the history and culture of the region and its vision of the future?





These systems are a form of checklist deeply embedded in the design processes of the Tejido Group, and we believe that an idea's relevance and usefulness increases according to the number of different ordering systems that it engages. For instance, an idea that concerns itself with only aesthetic issues is not nearly as useful as an idea that fully engages not only spatial and image-related issues, but also explores economic, environmental and social issues as well. A park with flowers is fine, but a park with flowers that meanders its way through a community increasing land values, creating economic opportunities, mitigating erosion, promoting urban water harvesting and encouraging meaningful social interaction is a richer, more layered and therefore more relevant concept and eventual urban component. We use these invariably interconnected systems as a means of verifying the relevance of our ideas. Our solutions must be multi-layered and satisfy the complex range of design determinants present in all urban settings. Over the years, we have come to understand and appreciate that interdisciplinary design and planning strategies have the ability to encourage meaningful transformation in urban environments. These ordering systems have in turn, become our definition of sustainability, and our focal intention has always been to develop Praha 7 as "A Sustainable Urban Living Prototype for Low to Middle Income Communities in Prague."

This has been a delightfully exciting project, and it has captured all of our imaginations and design energy. Our experience in the Czech Republic this past semester has been both enriching and uplifting. It cannot entirely be expressed in words the amount of gratitude that we have for the people who made this project possible. The memories that we will all take away from this experience will undoubtedly continue to shape and nurture both our personal and professional lives. We all sincerely thank all participants



for this opportunity and your essential and insightful contributions. The following document presents the design and planning efforts of the University of Arizona team. We look forward to sharing this outcome with you, and sincerely hope you will find utility and relevance in the design and planning products proffered within.

We miss all of you, and each of us wants to thank the Architectural Institute of Prague for your graciousness during our visit to your wonderful city and institution. It was a formative experience for all of us.

Once again, thank you.

Mark & Students

(ABOVE) Presentation at Architectural Institute of Prague for Prague city planners and developers





## TEJIDO GROUP 2015

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# INTRODUCTION

## ORDERING SYSTEMS

At Tejido Group our approach to all of our designs weighs heavily on how it fits into our ordering system. When we are considering a design solution, we carefully examine how each option fits into our ordering system and depending on the end goal we weigh each element accordingly. We select the design solution that functions as efficiently as possible and most appropriately suites its unique context. Our ordering system encompasses five basic elements and includes: aesthetic, function, economic, socio/cultural, and environmental.

The design team methodically asks how their proposals fit into each element of our ordering system in the following ways?

**Aesthetic:** How does it dissect its visual elements like proportion and other formal qualities including auditory, tactile, olfactory, thermal, and even kinesthetic—to achieve beauty?

**Function:** What is the purpose of the design (this is our primary guide)?

**Economic:** How does it give back to the community and allocate scarce natural and financial resources in an equitable manner to satisfy society's unlimited wants?

**Socio/Cultural:** How does in involve and combine social and cultural factors that signify a genuine representation of the community we are working in?

**Environment:** How will it minimize its impact to the least possible extent with respect to air, water, and biology of the surrounding area?

## VISION

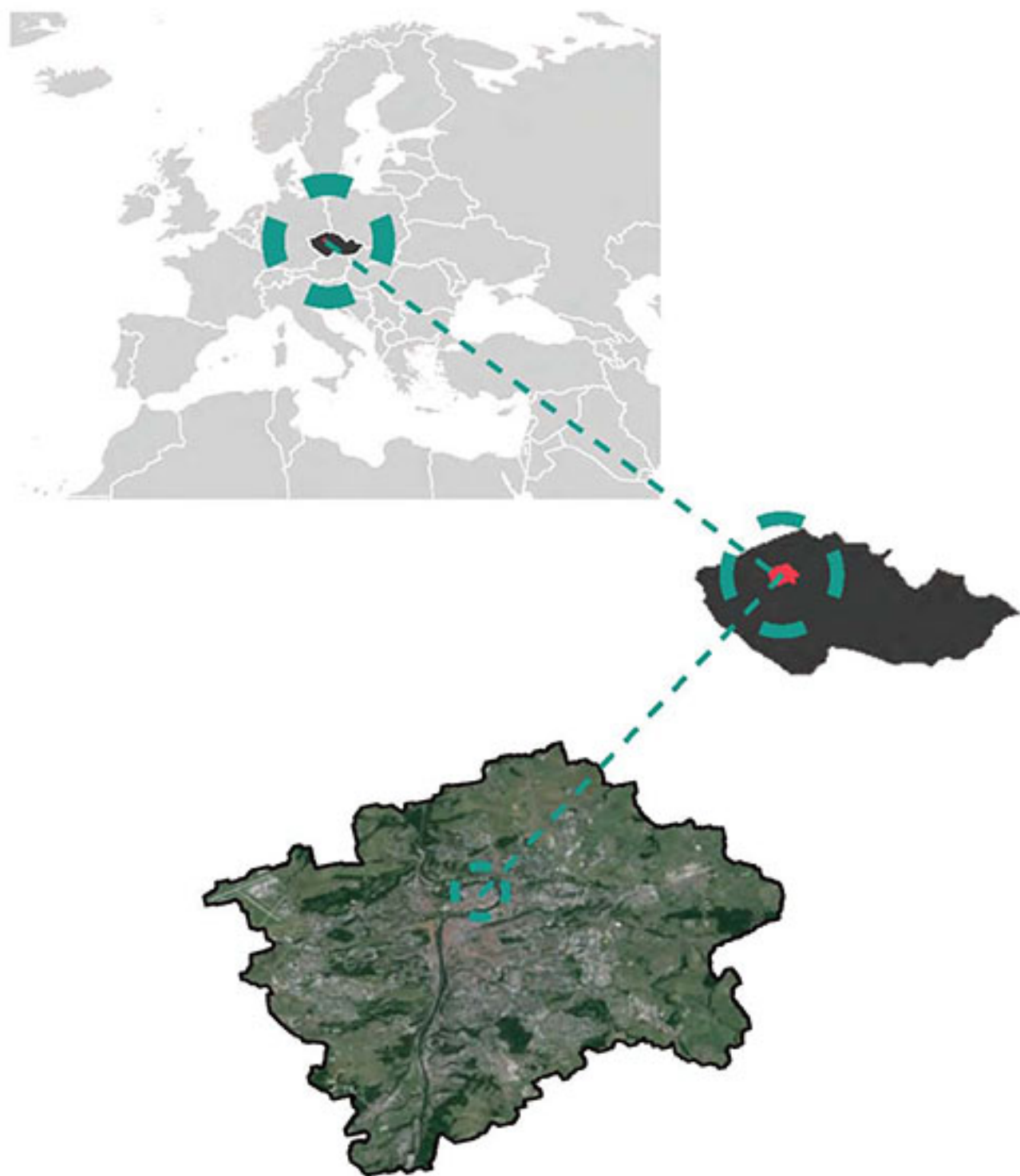
Tejido Group envisions a safe and demographically diverse development that provides outstanding job and recreation opportunities, while also providing exceptional transportation options for residents and visitors alike. We hope this development positively contributes to the vitality of Prague, provides a real sense of community, and improves the overall quality of life for the residents of Prague 7.

## GOALS

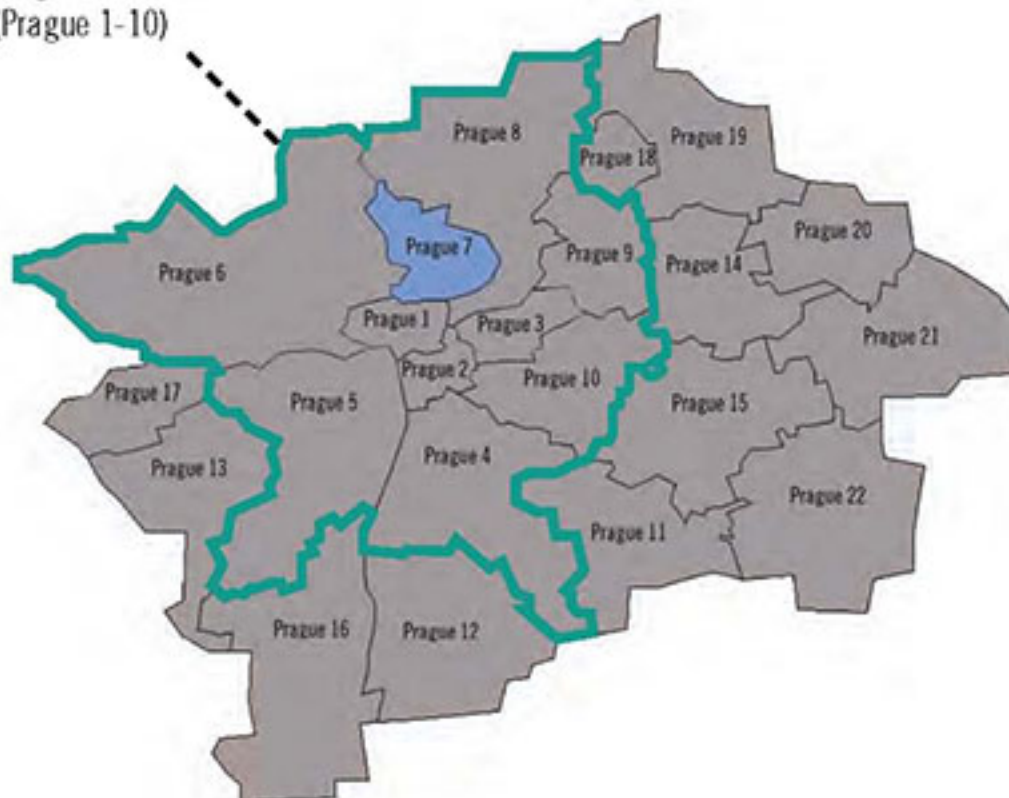
The goals of this plan are to reconnect the Bubny rail yards to the surrounding neighborhoods while systematically guiding development in the Bubny site so as to ensure that future development is ecologically sensitive, equitable, and creates jobs. Additionally, we wanted to provide accessible and affordable educational opportunities and services that promotes professional competence, economic development and improves the quality of life for Prague 7 in a multicultural environment. Finally, we hope to create a new urban identity integrated with the landscape with community-maintained recreational spaces, productive landscapes, and blue/green infrastructure. Designed to reshape public perceptions of industrial vacant land.



## SITE CONTEXT



Prague Urban Core  
(Prague 1-10)



## POLITICAL BOUNDARIES OF PRAGUE

Prague is divided into twenty two unique self-governing districts (I.01). Each district is respectively known as Prague one through twenty-two and possess their own unique urban fabric. Some districts are suburban while others are quite urban. The Bubny site is located in the heart of Prague 7 in one of the more urban districts.

## HISTORY:

### 1918 ORIGINS

Czech Republic was part of the Austro-Hungarian Empire from 1867 to 1918, after the collapse of the empire at the end of World War I Czechoslovakia was formed.

### 1938-1945 NAZI OCCUPATION

The Munich Agreement results in the Nazi annexation of the Sudetenland, the ethnically German northern and western regions of Czechoslovakia, initiating Germany's occupation. In March 1939 Hitler declares what is the Czechoslovakia the 'Protectorate of Bohemia and Moravia' from Prague Castle. Nazi occupation continues until the surrender of Germany to the allies.

### 1946 COMMUNISM WINS

The Communist Party of Czechoslovakia wins the first post-occupation national election.

### 1948 COUP D'ETAT

With Soviet backing the 1948 Czechoslovak coup d'état puts an end to the idea of revolution within the system and marks the beginning of a totalitarian single-party communist state.

### 1968 PRAGUE SPRING

In the attempt to give "socialism a human face" elected first secretary Alexander Dubcek eases restrictions on media, speech, and travel as well as decentralizing authority resulting in a welcomed political liberalization. Warsaw pact troops invade restoring Soviet control. "Prague Spring" lasted almost 8 months.

### 1969-1987 NORMALIZATION

An era of return to party rule and political commitment to the Soviet bloc. Laws and actions made by the reform movement during the 'Prague Spring' are restored. Economy is centralized and power of police authorities is reinstated.

### 1989 VELVET REVOLUTION

The collapse of the communist regime results in a peaceful transition of Czechoslovakia from single-party communist state to a multi-party parliamentary republic.

### 1993 VELVET DIVORCE

Czechoslovakia peacefully dissolves resulting in the independent states of the Czech Republic and Slovakia (1.02).

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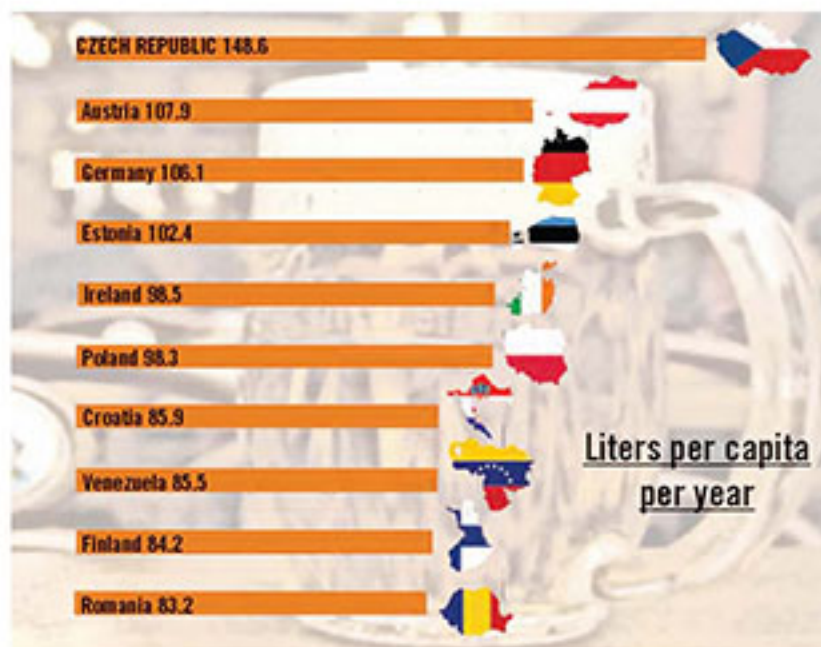
## CZECH CULTURE

In the Czech Republic beer and sausage are a significant part of the culture. However, there is much more to Czech culture than meets the eye or the lips.



### RELIGION

Atheist-Czech Republic is the second most atheist country in Europe, with 33.6% belonging to a religious denomination, and 11.7% attending church services once a month (1.06).



### BEER

In 2012 Czech Republic led all other nations in per-capita beer consumption for the 20th consecutive year! (1.03)

### FOOD

Czech Food Favorites Include:

- Pork & Beer
- Goulash
- Food carts-sausage, fried mozzarella sandwich
- Buns with goose filling
- Vietnamese Food (1.07).

### SPECTATOR SPORTS

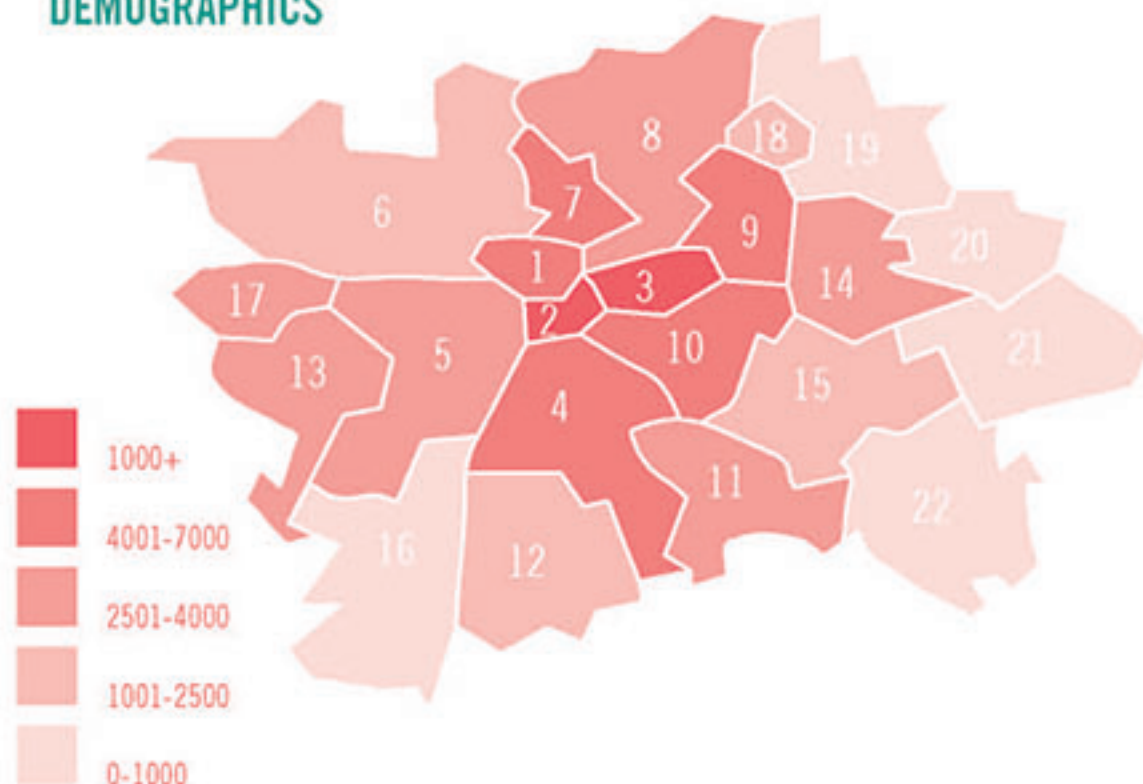
The most popular are:

- Soccer
- Ice Hockey
- Tennis

(1.04)

"Prague has recently become a hot spot for alternative sports competitions, such as skateboarding and hacky sack." (1.05)

## DEMOGRAPHICS

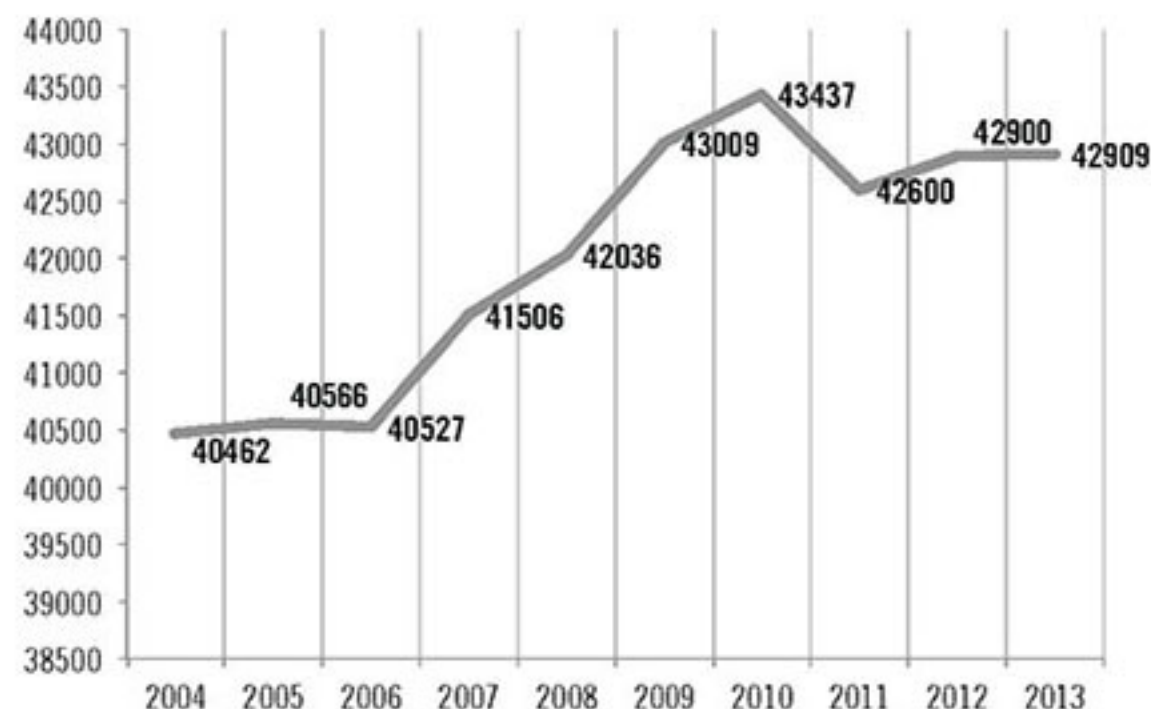


District	Population	Area Km/2	Density Km/2
Prague 2	48586	4.18	11610
Prague 3	71023	6.48	10957
Prague 10	108477	18.61	5830
Prague 1	29223	5.54	5279
Prague 4	135699	32.30	4202
Prague 7	42909	10.46	4102
Prague 9	53981	13.31	4056
Prague 11	83564	21.93	3810
Prague 8	111030	37.56	2956
Prague 17	30494	10.43	2925
Prague 13	64678	23.10	2800
Prague 14	47585	19.28	2468
Prague 5	84183	35.09	2399
Prague 12	64148	28.55	2247
Prague 6	110278	56.09	1966
Prague 15	45342	25.29	1793
Prague 18	27788	15.79	1760
Prague 20	15140	16.94	894
Prague 19	13177	15.80	834
Prague 21	17964	26.64	674
Prague 16	23425	36.15	648
Prague 22	14507	33.67	431

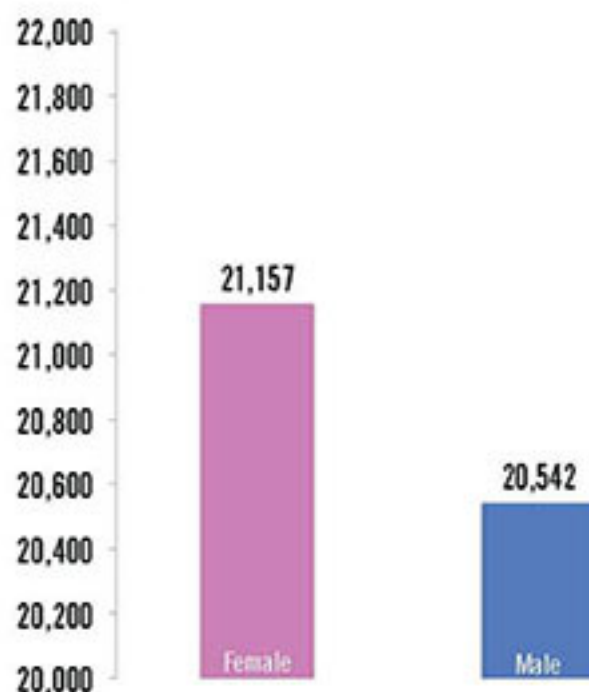
### POPULATION DENSITY

According to the 2013 statistics compiled by the Czech Statistical Office, Prague 7 makes up 2.1% of the total land area comprising a total of 10.46 Km/2 of the 496.15 Km/2 that constitutes the entire area of the City. Prague 7 is indeed one of the most densest districts in the city (1.08).

## POPULATION CHANGE



Between the years of 2004-2013 from which the latest statistics are available the population level has remained relatively stable. Though a slight decline is seen between the years of 2010-2011 (1.09).

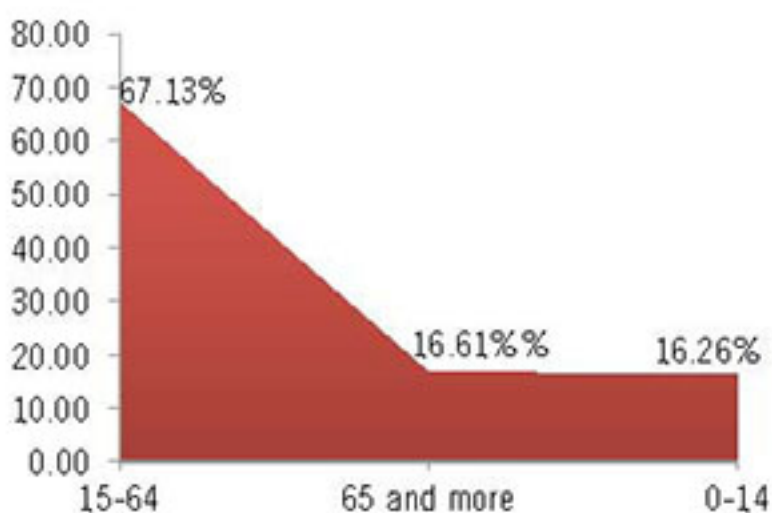


### FEMALE/MALE RATIO

In 2013 the male to female ratio was relatively even with Prague 7's female populous holding a slight edge over the male populous by 615 (1.10).



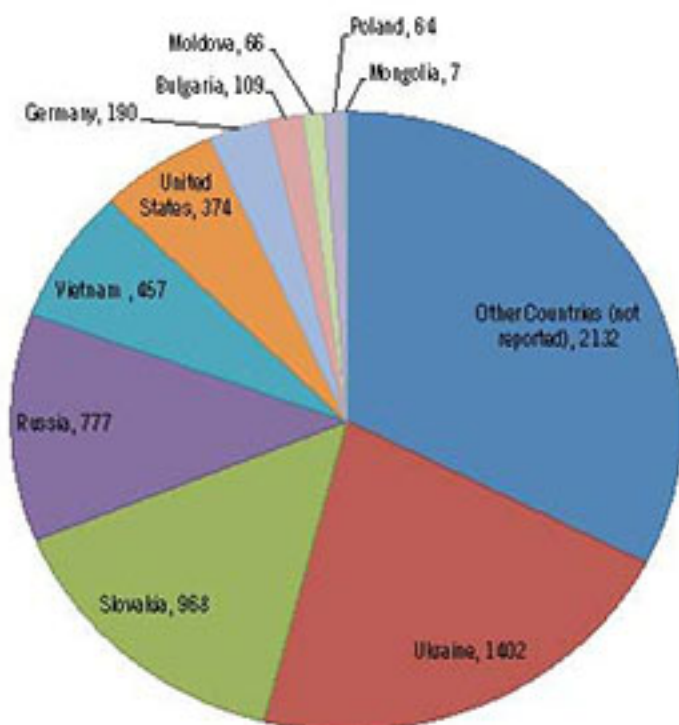
## DIVERSITY



The Czech statistical office breaks down age distribution into the three categorical divisions with the 15-64 being the category with the largest age difference. Consequently, those between the ages of 15-64 comprise a much higher percentage of the total age distribution as compared to the other two categories (1.11)



In 2013 Prague 7 had 42,909 people, of which 6,526 or 15.25% were not Czech. This is nearly double the average for the City of Prague as a whole. By comparison, the City's foreign population was 161,006 in 2013 or 7.29% of the total population of 2,243,201 (1.12).



It is interesting to note that a large segment of Prague 7's foreign population do not declare their nationality and of those that do declare most are from Eastern Europe with the exception of a significant Vietnamese population that migrated to Prague when the Czech Republic (then known as Czechoslovakia) was governed by communists. During communist times travel was only allowed between other communist countries (1.13).



# SITE ANALYSIS

## SUMMARY & METHODS

Site analysis is the initial stage of architectural and urban design processes and involves a systematic study of the site's features and surrounding context. This was our first task upon arrival to Prague and involved examining the site's features and taking an inventory of its biophysical characteristics. Some of the significant elements we examined included topography, hydrology, climate, land use, transportation infrastructure, and cultural heritage.

We broke into teams and walked the whole site as well as the surrounding neighborhoods, photographing and documenting what we found as part of our photo inventory. Our process of schematic development was interwoven with continual site visits. This process enabled us to test the feasibility of our ideas on the ground. We also explored the historic districts of Prague, looking for design in the old urban fabric. Throughout the whole site analysis process, the most important question we asked ourselves was: will this give us form? By asking these questions and looking for form, we could make more efficient use of our limited time. All in all, this chapter reflects the foundation from which our final designs arose.





## GREATER URBAN CONTEXT

### CITY OF PRAGUE

The context diagram displays the main roads, transit stops and how the entire City of Prague is connected. The major landmarks are labeled, as well as major train, tram, and metro stops. The city parks are described by the green space. The diagram is meant to reveal the missing connections throughout the City and specifically around the Bubny site.

This map shows how the Bubny site interacts with the entire City based on transit stops, tourist spots and open space. The goal of developing the Bubny train station and surrounding brownfields is to connect East and West Holesovice, which is currently split by the rail line was one our main concerns.

The pictures on this page include, the Prague Castle and Charles Bridge, The Bubny Train Station, The Vltava Tram and Metro Station, and the new Trojský Most Bridge. These pictures demonstrate how some of Prague's more prominent architectural features divide and connect the City. In developing the master plan for the Bubny site the goal is to enhance these elements and increase connectivity while maintaining a certain level of use by the public throughout the Holesovice area.

### COMMENT

Utilizing public transportation as a method to connect the East and West Holesovice areas, through enhancing current stations, and creating new elements such as public plazas, bridges and easier vehicular access through the entire site.



## SITE HERITAGE



According to the Prague history museum, the Bubny rail yard was completed in 1873 and remained in operation for approximately 140 years, completely ceasing operations in 2013 (2.01). In its inaugural year the facility repaired 3,000 freight carriages and produced 150 new carriages (2.02). After 1931, only passenger cars were repaired. However, near the end of industrial operations the Bubny compound began to repair post carriages (2.03). The compound's workshops were the busiest after the Second World War; during this time period the compound employed more than 1,000 workers (2.04).

Though the Bubny site's archaeological and historical heritage can be traced back to the Stone Age. The site's most prominent historical underpinning is related to its industrial heritage, specifically its relationship with Czech Republic's rail industry and the Industrial Revolution. The site's industrial heritage can still be seen today, as many of its industrial architectural remnants from its industrial past are still standing and are full of potential.





Industrial Warehouses

Railroad Repair Shop

Industrial Warehouses



Bubny Train Station

## SITE HERITAGE

In 2004, the industrial compound was designated a cultural monument by The National Heritage Institute (2.05). However, it was removed 2006 as a result of developer pressure (2.06). The Bubny Train station was once the setting of one of Czech Republic's darkest chapters in its history. In the 1940's it was used as staging point for Czech Jews to be sent to concentration camps including Theresienstadt and Terezin (2.07). Most were subsequently sent to Auschwitz, one of the most infamous of all the Nazi concentration camps (2.08). Conversely, there are now plans to create a memorial to the victims, through the creation of a Holocaust museum within the former station.



## SITE LAND USE CHANGE

Prior to developing into a rail yard and industrial complex the Bubny site was surrounded by agricultural land and fishing villages. This would change in 1837 when a textile mill was built signaling the end of this era. In 1846, the Prague-Bresden railway was built, the line traversed the site, but did not stop in Bubny, as the Bubny station had yet to be constructed.



1840

Industrial Evolution

1908



By the turn of the century Bubny had transformed into a full blown heavily industrialized zone. The development of coal has a viable energy source in the latter half of the 19th century coupled with the site's geographical conditions including its proximity to water and the availability of vacant land greatly influenced its industrial development.



## SITE LAND USE CHANGE

The twenty years of the first Czech Republic (1918-1938) was heralded as a progressive era. Resulting in greater economic vitality and increased industrialization. During this time the population dramatically increased in the neighborhoods surrounding the Baber site as the site continued to increase in industrial capacity.

1938

Industrial Evolution



1953

After the WWII Prague endured its own form of urban renewal as a highway was built connecting the inner part of Prague with its outer quarters, this is the roadway located at the Eastern edge of the site running north and south. As a result of its construction a host of historic buildings were demolished to make room for it.





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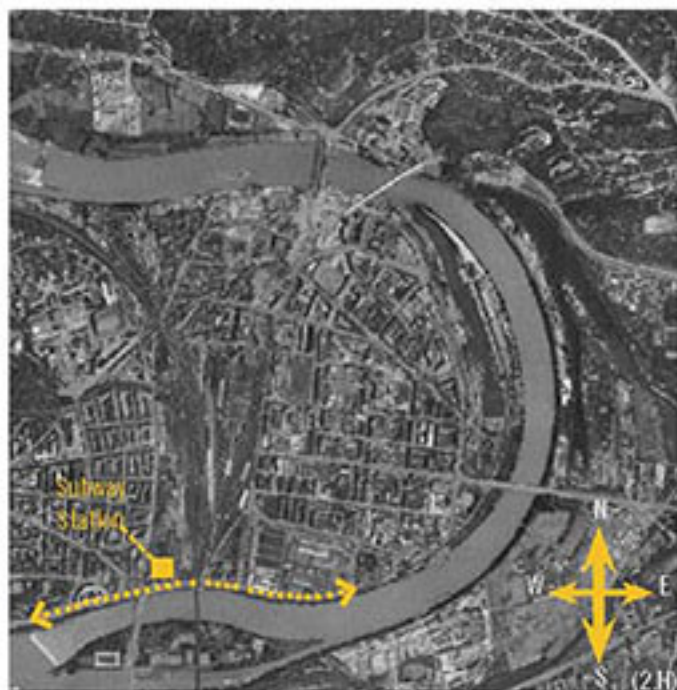


## SITE LAND USE CHANGE

In the 1960's another highway was constructed to the south again resulting in the demolition of a variety of historic resources. By the 1970's the subway arrived and a station was subsequently built. The entrance is built along the Southwestern corner of the site.

1975

Industrial Evolution



2014

The Buttry site has remained undeveloped since completely shutting down industrial operations in 2006. Though the city has approved a master plan for the site political change has stalled its development. The area circled near to the harbor is being revitalized with new condominiums and fresh landscaping that may lead to gentrification in the surrounding neighborhood if it is not regulated properly.





## SITE PHOTOS

### Photographic Regions

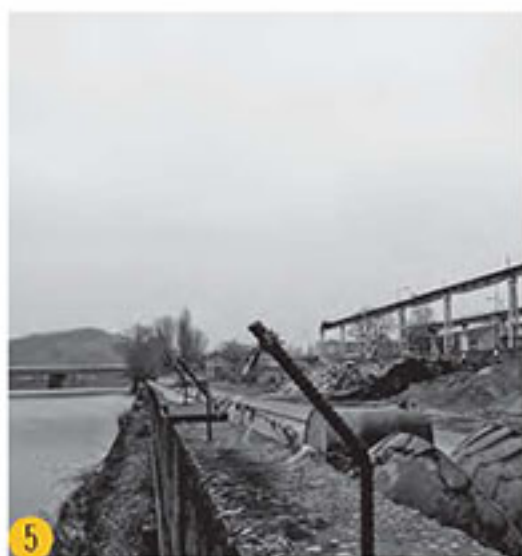
This catalogue is an assemblage of the entire class's set of photos collected during the time of the site visit, which occurred in the overcast winter season of mid-February, 2015. For presentation purposes, the site has been split into 4 separate zones, each approximately encompassing an area of 18 hectares. The following pages display photos from each particular zone, taking the reader on a trip from north to south, highlighting the most important aspect of the site, which helped to inform the class's initial concepts and final master plan.



## NORTH RIVERFRONT







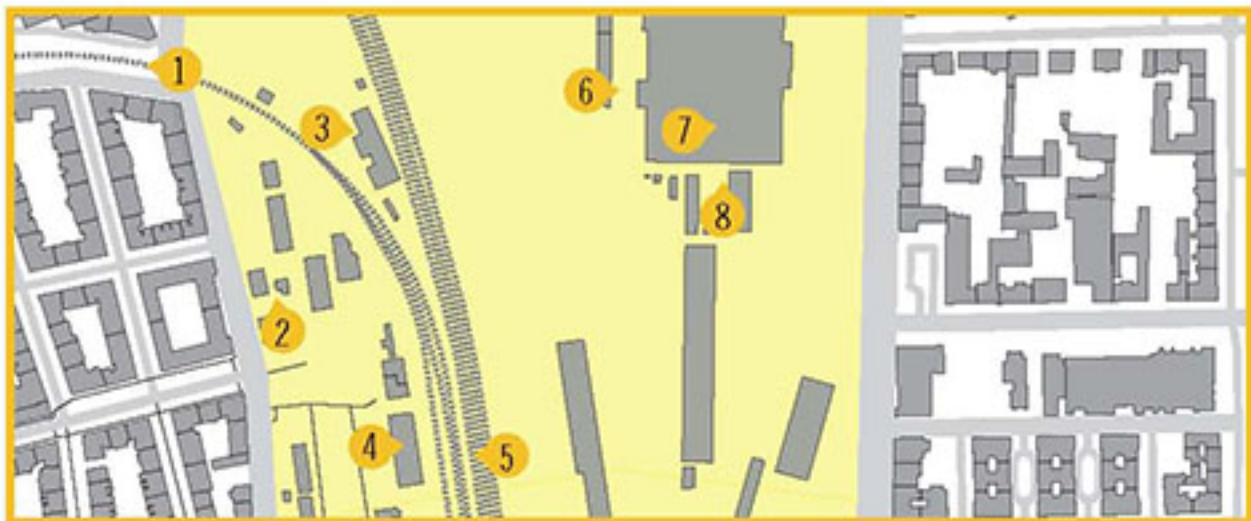
## NORTH CENTRAL







## CENTRAL



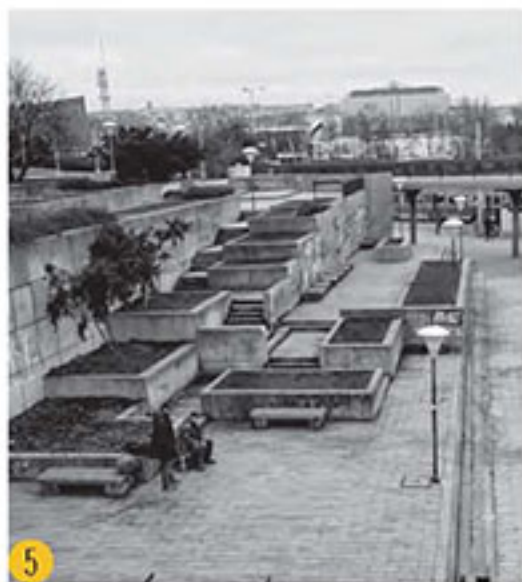




## SOUTH RIVERFRONT









## EXISTING BUILDING CONDITIONS

The existing urban fabric of Prague 7 already has a sense of identity and infrastructure. Within the Bubny site, however, the urban fabric comes to a stop.

**GOOD CONDITION (KEEP)** - The built environment typically consists of blocks of mixed use buildings, with both residential and commercial. These types of buildings create a dense urban fabric to the east and the west, and almost all of them are in good condition and being used consistently.

**SALVAGEABLE** - Within our site, there are abandoned buildings that were previously used for train maintenance. Now, they provide existing built structure ready to be repurposed.

**POOR CONDITION (ELIMINATE)** - A number of small structures on our site are in poor condition, partially or fully abandoned, and do not provide the infrastructure to be repurposed. We are proposing to get rid of these buildings to better the urban fabric.

## BUILDING AGE

Indeed Prague is a historic city with much of its historic building stock still intact. The fact that "Old Town Prague" has been designated a World Heritage site probably has a lot to do with it (2.09)



### HOUSING

by Construction Year

(all of Prague)

before 1918

1918-1945

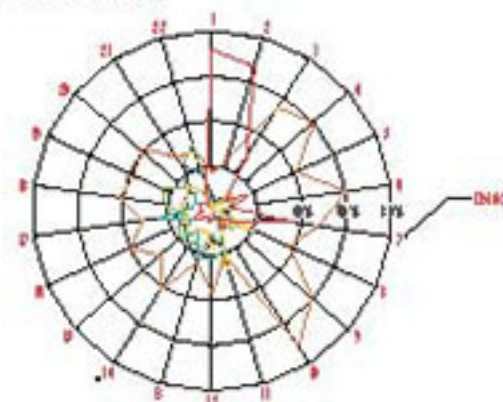
1945-1960

1960-1975

1975-1990

1990-2000

2000-2010







**SALVAGEABLE**



**GOOD CONDITION**



**WHACKABLE**



## TRANSPORTATION INFRASTRUCTURE

### TRAINS, TRAMS, METROS, AND BUSES

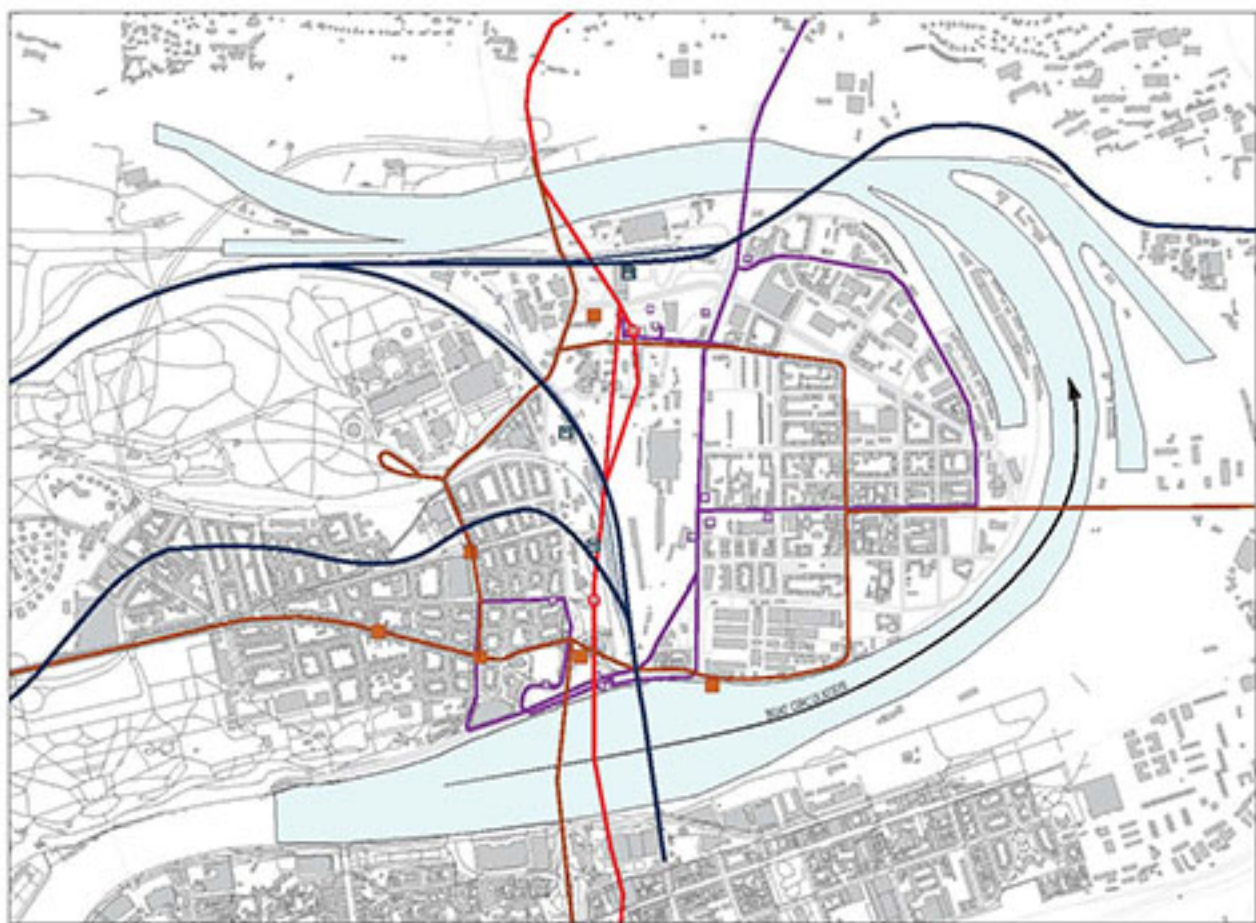
The city of Prague exists as an urban fabric with strongly established transit infrastructure clearly in place. The majority of Prague citizens utilize the public transit of the city to get back and forth to work, to get to bars and restaurants, and to get to different parts of the city on the outskirts of Prague. The public transit is so prominent that the average citizen doesn't feel the need to own a car. The tram, bus, and metro system allow for ease of transportation within and in between the districts of Prague, and long distance passenger trains even make it easy to access other parts of Europe without having to fly.



### DESIGN CONCLUSIONS

The existing infrastructure of public transit around the site in Prague 7, as well as in Prague as a whole, provides ease of access for pedestrians around most of Prague. Within our site, however, there is a dearth of public transit lines, specifically the tram. This presents opportunities to not only implement lines of transit into the site, but to create a transit hub to house all modes of transportation.





## TRAINS, TRAMS, METROS, AND BUSES

The infrastructure within Prague 7, similar to the majority of Prague, provides many options for people to get around without the use of a car. Boat circulation even exists around Prague 7, going north to south, allowing for delivery of goods, as well as the moving of people. However, within our Bubny site, the infrastructure stops. The circulation goes around the site, causing even greater separation between the east and west districts of Prague 7.



It is clear that commuter percentage rises in the suburbs as compared to Prague's urban core as there is a positive correlation between density and commuter percentage (2.10).



## TRAIN SYSTEM



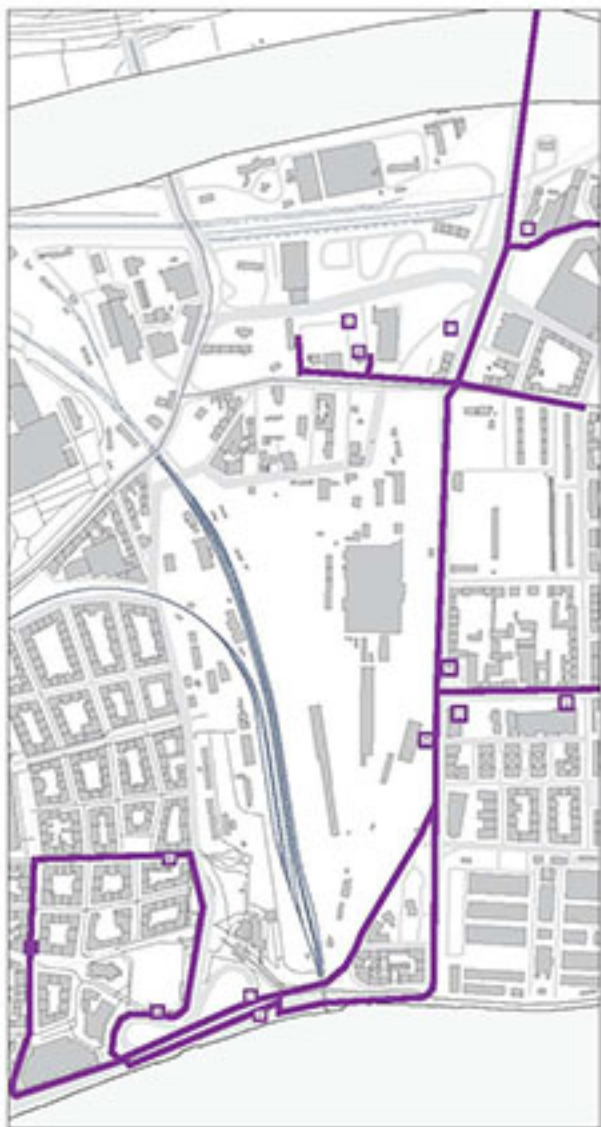
A railroad system provides a prominent feature within the site. An existing railroad runs north-south in the site, and both freight trains and passenger trains utilize the infrastructure.

## TRAM SYSTEM



The tram system in Prague is mainly used for short distance ground travel within districts, rather than across Prague. Around our site, there are trams running mainly East - West, bordering our site to the north and the south. The tram lines, however, don't go through the brownfield, which makes up a large part of our site, creating an east-west division and a lack of transit north south within our site.

## BUS SYSTEM



The Prague city bus system mainly serves the outskirts of Prague, and is therefore used mostly by locals, and not tourists. Because our site is located outside of the tourist heavy area of Prague, it is surrounded by bus lanes and bus stops, particularly dense to the east and southwest of the site. The bus lines predominately run in areas that are not serviced by the metro or the tram. The bus system runs from 4:30 am to 12 midnight in 6-8 minute intervals during peak hours, in 10-20 min intervals in the off hours, and 15-30 minutes on weekends.

## METRO SYSTEM



The Prague metro system consists of 3 main lines: the GREEN LINE A (Dejvická - Depo Hostivař), the YELLOW LINE B (Žižkov - Žerný Most), and the RED LINE C (Letšany - Háje). The RED LINE is the line that goes directly through our site, with the Vltavská stop towards the south of our site. The RED LINE runs North-South in Prague, and crosses many districts. The YELLOW LINE runs East-West, and stops along many tourist attractions. The Green Line runs East-West as well. Neither the Green or Yellow lines cross through our site. HOURS OF OPERATION: 5am-Midnight.





## OPEN SPACE ANALYSIS

### Recreational Activities and Open Space

Due to the popularity of outdoor activities, open space and green areas for recreational or sustainable purposes are essential. **These spaces allow for the community to interact and connect to nature within a heavily paved city.** Based on a study made by the Cultural Research Institution, locals prefer their public spaces to serve as relaxation areas that allow for human interaction, sports and transportation. Therefore, existing recreational areas are preserved or redeveloped to allow for a more active participation between the users. As seen in the diagram on the top right, the site is placed in proximity to several recreational areas such as soccer fields, tennis fields, a hockey stadium, a skating park and a golf course.

Additionally, when analyzing other more utilized areas in Prague, the composition of spaces is easy to compare. Prague 7 is designed in a very open manner, where there are no clear definitions for space or activities (see images on the top). On the other hand, Prague 1, one of the most visited and active districts in Prague, is designed through a choreography of open and contracted spaces, these flow of contraction and expansion allows the user to circulate through small corridors while interacting with different commercial opportunities, and then arriving into open green areas or plazas that allow for more communal activities, such as street vendors, public entertainment and sitting areas.

The Bubny site is envisioned to be a system of green corridors and open spaces with residential and mixed use opportunities, that would connect the east and west areas of Prague 7. These strategy is achieved by proposing green spaces as recreational areas and buffers.



### MATERIAL

Through the analysis of local open areas and spaces of activity. The material palette utilizes paved areas and green areas equally.

This strategy is applied because of type of activities held in public spaces.

### PURPOSE

**Through the development of greenways and green open spaces, the Bubny area is connected in a safe manner. Allowing for a more pedestrian friendly circulation and increasing growth opportunities.**





### Redevelopment of Existing Open Space

The insufficient spectrum of activities in certain segments of Prague 7 allows for homeless people, drug dealers, drug users and garbage to take place in open areas. There is a general lack of maintenance and a presence of dark, extremely shaded areas that not only invite crime but feel unsafe and are unappealing to the eye. In order to minimize the presence of crime, open spaces will be designed as highly programmed areas that allow for users to interact and create social awareness.

Additionally, open areas will vary in scale, allowing for plazas, pocket parks, neighborhood parks, and regional parks. This system of open spaces will then be connected through a system of green, pedestrian friendly corridors and green fingers. Allowing the user quantity to increase and the crime to decrease.





Views of the river front and surrounding urban context around the Bubny Site.

The View of the North end of the site looking towards the river. This also demonstrates the public access that needs to be developed around the entire river edge.

## VIEW SHEDS

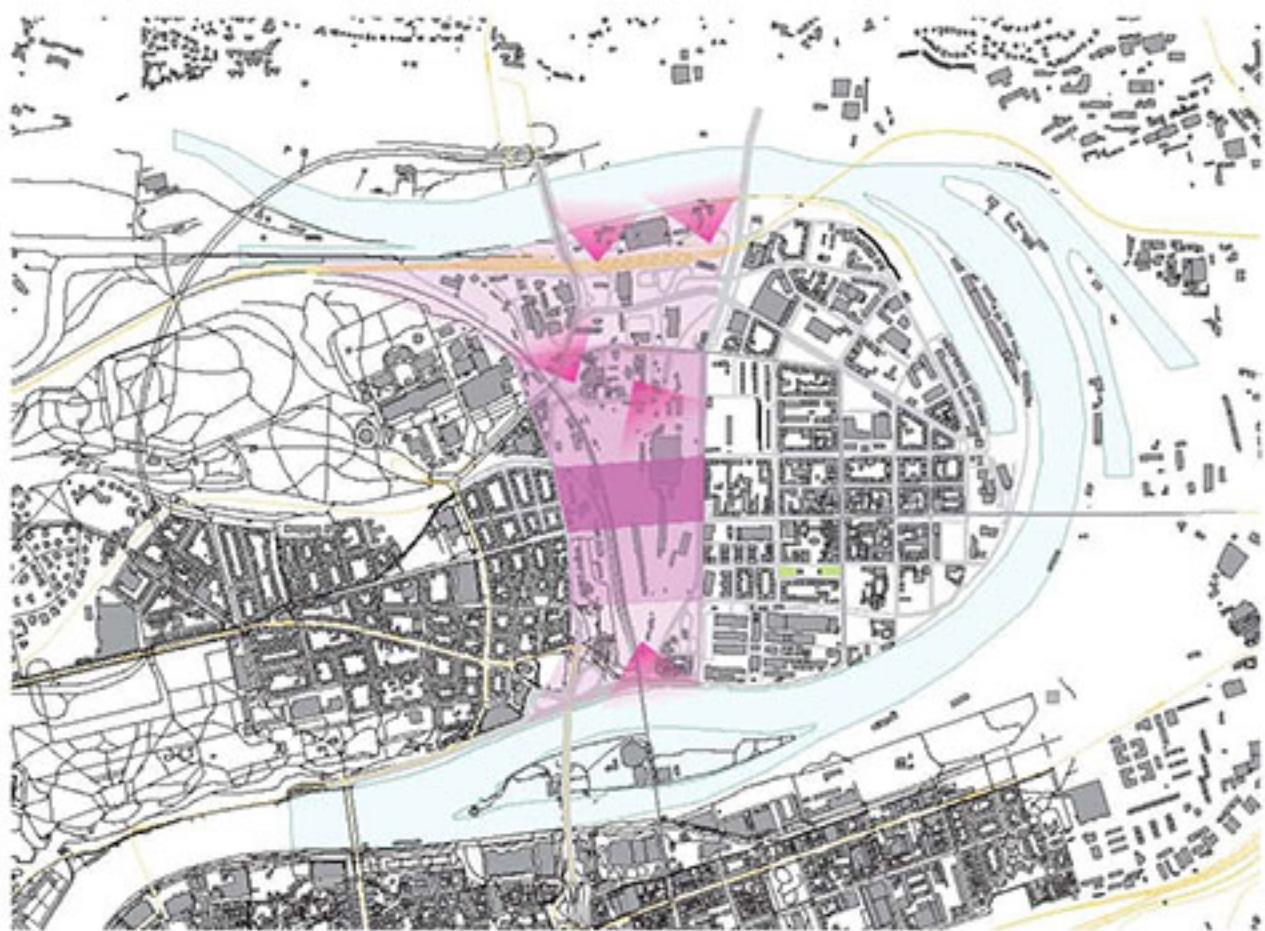
### City of Prague

Through analysis of the Bubny site based on view sheds, revealed that the waterfront should be left open to the public, the next area back should be low rise mixed use commercial and residential, and the middle could be left for high rise development. The diagram shows the different building types that could be placed in each area. Orange needs to be extremely low rise buildings that are accessible to the public at any time. The yellow is mid rise mixed use that could be 2-5 stories. The green could be developed as high rise commercial or educational

#### COMMENT

The view sheds from the site support the idea of leaving the river front open to the public, and the closer to the middle of the site the more dense the buildings can be.





The View sheds from the middle of site are of other urban development, which include modern and classical architectural elements. This means the high rise buildings would be the next step in modern development and would be supported by the neighborhood and community.





## HYDROLOGY

### FLOOD PLANES

Prague has experienced severe flooding in 2002 that has since impacted design decisions in a dramatic way. Topography levels vary throughout the site and create severe flood planes that will continue to be susceptible to future floods unless an innovative design solution is reached.

The flooding in 2002 led to thousands of people being evacuated and numerous historical landmarks being submerged in water. For future designs, flood prevention and containment devices need to be utilized so Czech culture and way of life is kept intact. The community cannot rely primarily on temporary barricades that may not even be fully set up by the time a flood hits. Prague needs an innovative and permanent design solution that works with the land and current budgets.

#### Upper Left Image

The water levels almost overtook the bridges in 2002. The Charles Bridge, second from the front, is luckily the most elevated in the area.

#### Upper Right Image

Countless businesses and landmarks were destroyed from water damage that was not containable on such short notice.



The map above shows how the far east section and northern strip between the two bridges are at the highest flood risk. If another large flood should occur, areas to the east and northwest are in danger. The southern portion of the Bury site also warrants concern. Drainage primarily runs west to east, with some northern water drainage into the site near the main transit hubs. Hydrology analysis informs us that having potential green strips run up the east and west edges of our site would remain watered and could help mitigate flooding. Having water basins and bio swells are also viable options on the east and west where water tends to flow to.



## NOISE ANALYSIS

Adding new residential and commercial real estate along busy arterial roads and rail lines requires a lot of thoughtful design intentions to mitigate the noise that new residents will live next to. The rail lines currently have a train pass by approximately every hour. The future however, will be busier. Both commercial and passenger trains are going to run more frequently and on fewer lines.

The current rail lines are in need of some aesthetic updating as well as more places for residents and visitors to wait for the increased amount of passenger trains that will come through Bubny.

The roads are in good condition, but cobblestone creates more road noise than pavement. Keeping cobblestone is important since it is a local material choice, therefore road locations and landscape become crucial.

### IMPORTANCE

Different road surfaces generate various amounts of road noise. This should be under consideration when designing main roads.



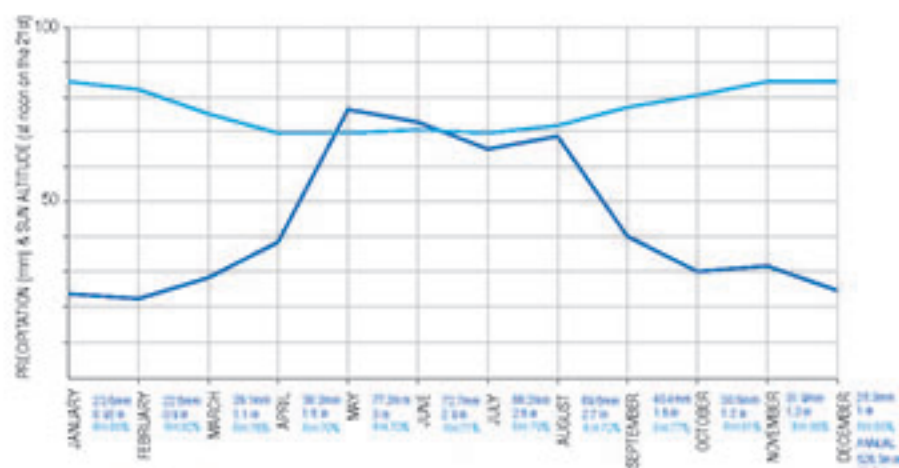
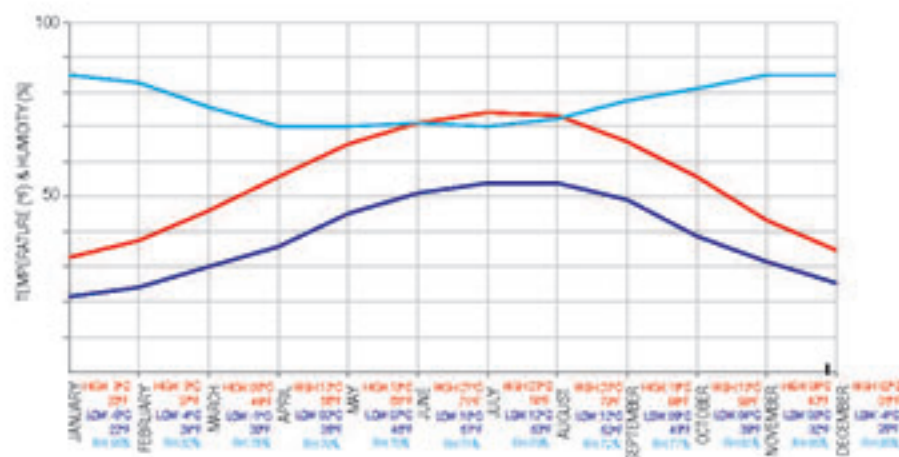


The above diagram shows which roads are more active as well as heavily trafficked intersections. The north-south road on the east and west side of the site remain busy throughout the day and night. These roads would benefit by dealing with a lessened load of vehicular traffic but an increased amount of pedestrian traffic.

By having easily accessible roads for pedestrians more people would opt to walk. It would also be beneficial to increase public transportation since a strong tram system exists. Adding a new road that connects west to east is another option that can ease use on the main roads that run north to south.

## IMPORTANCE

By looking at road usage, there is a clear need to remove, repurpose, and add roads to the site to decrease the overall noise generated around the site.



## CLIMATE ANALYSIS - 50°6'N, 14°15'E, 1199 ft

The city of Prague lies between oceanic climate and humid continental climate (Köppen Cfb). The winters are relatively cold with average temperatures at about freezing point, and with very little sunshine. Snow cover can be common between mid-November to late March although snow accumulations of more than 20 cm (8 in) are infrequent. There are also a few periods of mild temperatures in winter. Summers usually bring plenty of sunshine and the average high temperature of 24 °C (75 °F). Nights can be quite cool even in summer, though. Precipitation in Prague (and most of the Bohemian lowland) is rather low since it is located in the rain shadow of the Sudetes and other mountain ranges. The driest season is usually winter while the summers can bring quite heavy rain especially in form of violent storms and showers. Temperature inversions are relatively common between mid-October and mid-March bringing foggy, cold days and sometimes moderate air pollution. Prague is also a windy city with common sustained western winds and an average wind speed of 16 kph (10 mph) that often help break temperature inversions and clear the air in cold months (2.13).

### DESIGN IMPLICATIONS:

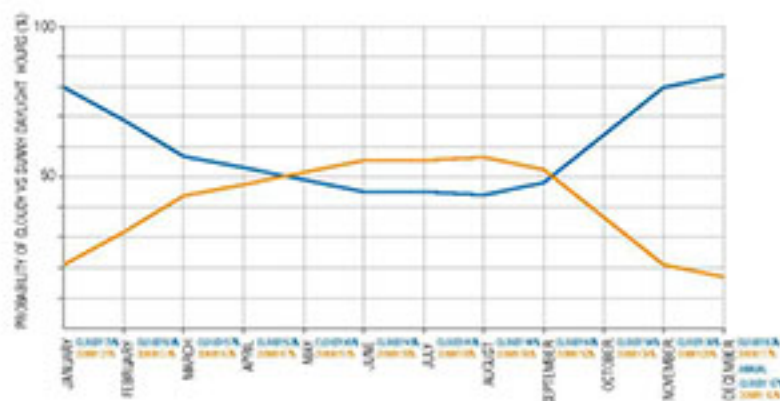
Relative Humidity is at its highest percentage during the winters.

Due to the low temperature in the winters, cross ventilation has to be limited to small openings.

### DESIGN IMPLICATIONS:

Precipitation at its highest during the summer season.

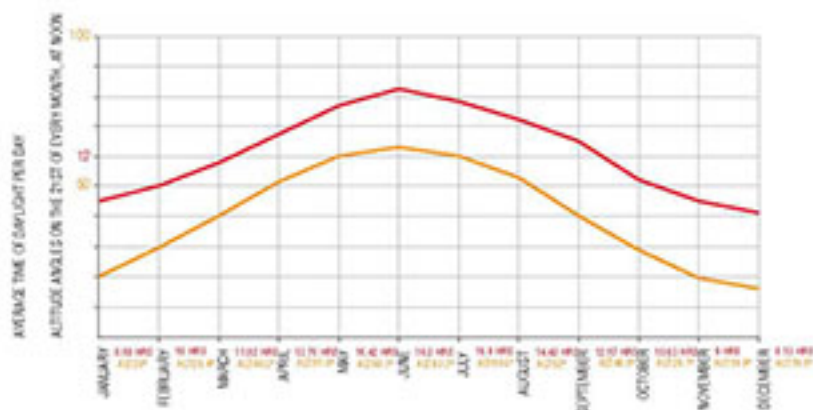
Which indicates that the likely-hood of a flood occurring is at its highest during the monthly span of April through September.



#### DESIGN IMPLICATIONS:

There is a 17% probability of the forecast being sunny in the month of December.

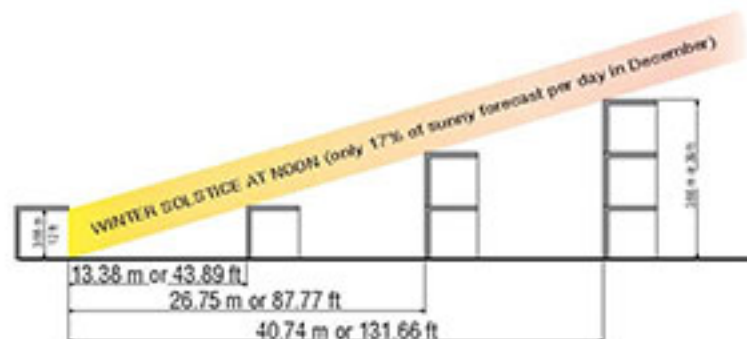
Therefore it is very difficult to achieve Passive heating in the winter when there is little solar exposure.



#### DESIGN IMPLICATIONS:

Higher Altitude angles provides more hours of daylight during the day.

Therefore it is very difficult to achieve Passive Heating in the winter when there is the least amount of daylight during the year.



#### DESIGN IMPLICATIONS:

During the Winter Solstice, each southern facade needs to be minimum 13.38 m away from each other, to gain full solar exposure.

Design will have to rely on internal heat sources and insulation to achieve thermal comfort.





## LAND USE ANALYSIS



### COMMERCIAL

The ground floor is essential for commercial activity in Prague. Most of the existing commercial businesses are of small scale and low impact. This characteristic allows local businesses to sell products or food along the street edges. The majority of buildings are mixed use, with a dynamic ground floor that is constantly interacting with the pedestrian flow of the daily user.



### RESIDENTIAL

Residential areas are located on the upper floors of the existing buildings in Prague. Due to the amount of required housing for the area, verticality is a prominent characteristic of Prague 7.

Mixed use buildings are essential for the economy of Prague 7, because they allow residents to live and work within the same area. This strategy targets key issues such as transportation for locals.



### INDUSTRIAL

The industrial area is positioned north of the site. Where transportation services such as bus and train stations are located. Additionally, a sports arena is located north-west of the site, connecting the user with one of Prague's most important recreational park.

Additionally, the east extreme of the site is seen as a possible industrial area due to its proximity to the water.



#### GREEN AREAS

The existing green areas around the site are extremely underutilized due to lack of connectivity and security.



#### BROWNFIELDS

Existing brownfields are potential targets for the design and development of pocket and neighborhood parks.

#### LAND USE ANALYSIS

The diagram above shows the type of land uses that surround the site and exist on site. Commercial development mainly happens along or in proximity to the water's edge. Residential development is highly concentrated on the south-west of the site, while some residential areas are mixed within commercial and mix-use buildings on the east of the site.





## SURROUNDING LAND VALUES

As a result of its former land use, which was a heavily industrialized railroad switching and repair facility, the site can be labeled a "brownfield". Brownfields are usually old industrial sites, but can be commercial areas as well. They are basically sites that have been abandoned and/or are underused, that no longer support their previous uses and are likely to be contaminated and/or polluted. Accordingly, these types of sites are difficult to develop, and often remained vacant until a public/private partnership can be developed to the point where it becomes economically feasible for a developer to purchase the land, clean it up, and subsequently redevelop the site. Likewise, the Bubny brownfield has definitely had an impact on property values. This is evident along the Western edge of the site, because the area of the site is underutilized the surrounding properties to the west have suffered from depreciated land valuation.



E.



D.



A.



B.



C.

Due to the under utilization of the existing road network fronting the properties, along the Western edge of the site, land values have suffered. Conversely, the properties along the other edges of the site and their corresponding land values have benefited from their proximity to major roads and public transport.





## GENTRIFICATION

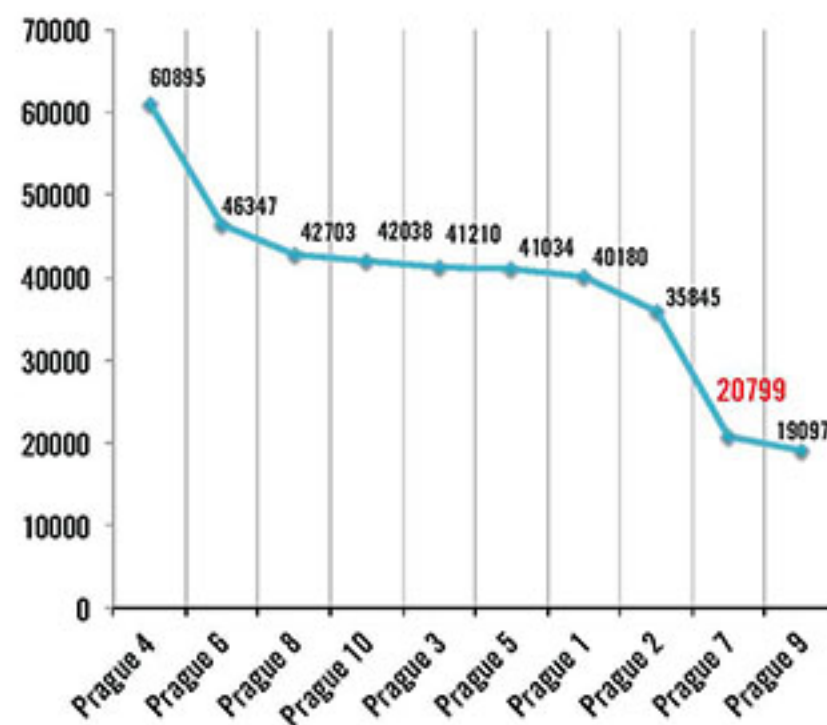
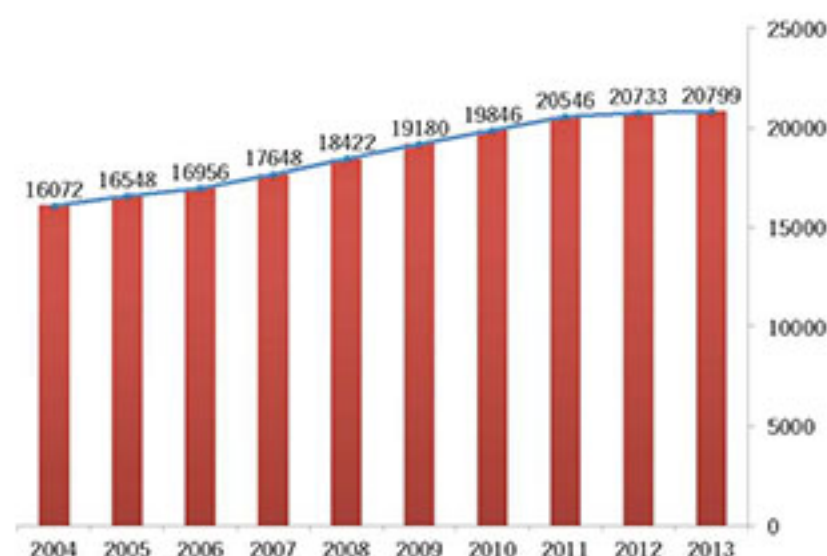
During our site analysis in the surrounding neighborhoods, we encountered an area that had a high potential of becoming a gentrified area. Accordingly, it is our hope that the City of Prague takes into account the developers actions in this area, so that when the Bubny site is ultimately developed, gentrification will be minimized. Whereas new development and revitalization can certainly be viewed by the City as respectable progress, since new development indeed creates jobs and brings new life and energy back to areas that have historically been neglected, there are also negative consequences to this type of growth. Once the amount of money the developers have invested in these properties becomes known, surrounding property values will ultimately rise resulting in higher rents for tenants or property owners may decide to sell their property altogether to developers offering them a substantial amount of money, while long time residents are then evicted to allow for redevelopment aimed at attracting more affluent residents.

### METHODS TO COMBAT GENTRIFICATION INCLUDE:

- IMPLEMENT INCLUSIONARY ZONING:** this would require any new development to include a certain percentage of its units to be affordable based on market conditions usually around 25%.
- TRANSFER OF DEVELOPMENT RIGHTS** the City could purchase the development rights of certain developers to preserve open space and neighborhood character, but allow increased density in areas where that would not normally be allowed.
- CREATE A RENTAL VOUCHER PROGRAM** for long-term residents to make up for the difference between what they can afford and the new market rate for rentals in areas where new development is occurring.
- REGULATE NIMBY'S (NOT IN MY BACK YARD):** Allow for more development in more affluent areas that often deny new developments in their neighborhoods, forcing developers to develop elsewhere (2.11).



## BUSINESS GROWTH



Though business growth is steadily growing in Prague 7 when compared with nearby districts, Prague 7's number of registered business ranks among the lowest. (2.12)





# LITERATURE REVIEW + CASE STUDIES

## PROCESS

After returning to Tucson, the studio divided into three teams. The team dedicated to Literature Reviews and Case Studies took the ideas that were being generated and organized by the Site Analysis and Master Plan teams and investigated relevant theories and strategies for the Bubny Site.

The theories and case studies were researched and analyzed to determine poignant relevancy, effectiveness.

The theories all speak of sustainability, albeit in different ways, like a dialog. Often the term “sustainability” clouds a project’s true directive. It becomes a quick label that can be slapped onto anything with a green roof. We knew that if the master plan was supposed to be a prototype for sustainable urbanism in Prague, then theories and strategies become highly relevant in clarifying our intentions.

With strategies, the theories become empirical tests. We chose select precedents that utilize specifically relevant and potential methods for designing a better master plan thereby designing a better Prague.



## SMART GROWTH

Smart Growth is an approach to urban design that concentrates growth around urban centers thus minimizing sprawl. Smart Growth accepts growth as inevitable and uses common strategies such as high density, transit-oriented development, walk-ability and complete streets, urban growth boundaries, and open space to make development better for the environment and its inhabitants.

It is not a definite theory as it has been altered since its inception in the 1990s. However, the core elements of concentrated growth remains the same.

Many of the New Urbanism rules are incorporated into Smart Growth, however Smart Growth takes on a larger, long-term urban planning scale (3.01).

Smart Growth includes or can include:

- High density - Mixed Use
- Open Space
- Sustainable water management (storm water collection, natural filtration of gray water, bioswales, etc.)
- High-performance Infrastructure
- LEED Neighborhoods
- 2030 Challenge buildings
- Defined neighborhoods and Districts
- Complete Streets (shared safe access for bikes, people, and cars)
- Car sharing
- Food production
- Mass transit systems
- Biodiversity corridors

### PORTLAND, OREGON

In 1973, the state of Oregon passed a land ordinance law that required all cities in Oregon to develop urban growth boundaries based on a 20 year growth estimate. Though the term Smart Growth had not been coined yet, this law set in motion Portland's smart growth planning system. Outside of these urban growth boundaries, the code severely restricted growth. Additionally, incentives are commonly given to developers who chose to develop within the city (normally a much higher expense - as in Tucson, most developers would rather chose to develop on virgin land near the extremities where development is cheap).

### SIGNIFICANCE

Most aspects of Smart Growth + Smart Code have value, with transit-oriented development, dense urban centers, mixed-use, open space, and complete streets. But Smart Grow and Smart Code focus on small block development; great for the individual developer, bad for true sustainable urbanism. True urban sustainability begins with a holistic plan that uses the parts to create a stronger and better whole.



## SMART CODE

Smart Code is a unified land development ordinance for planning and urban design. It considers: zoning code flexibility, subdivision regulations, urban design, and architectural standards. Smart code supports community vision, transit options, mixed use, and conservation of open lands while preventing sprawl and auto dominated streets (3.02)

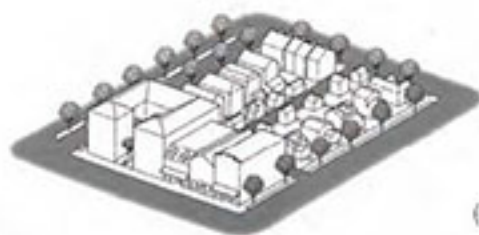
CONVENTIONAL ZONING



DESIGN GUIDELINES



FORM-BASED CODE

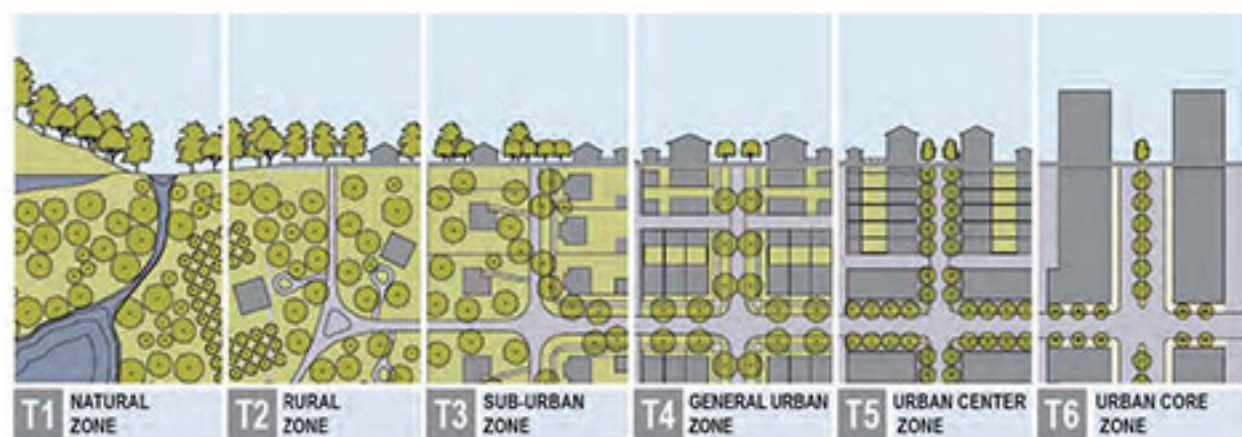


(3.B)

### DEVELOPMENT CODES

The figure to the left shows three different types of development regulation: conventional zoning, design guidelines, and form-based code





(3.C)

## NEW URBANISM

### TRADITIONAL NEIGHBORHOOD DEVELOPMENT

New Urbanism attempts to combat suburban sprawl and placelessness by creating human-scale walkable communities inspired by historic precedent and traditional neighborhood development. While New Urbanist planners and developers employ many strategies, an underlying set of principles establishes the theoretical positioning of New Urbanism. The seven principles of New Urbanism are as follows:

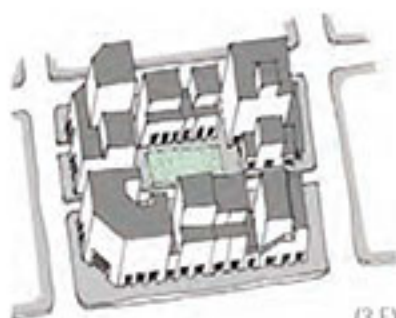
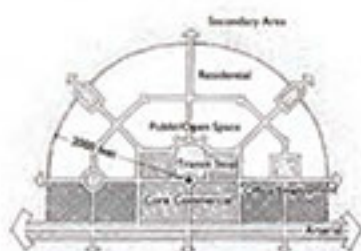
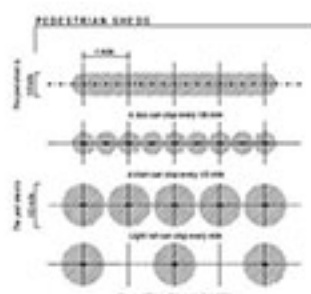
- The neighborhood is the fundamental building block, with clusters of neighborhoods making up the city.
- Neighborhoods are limited in physical size to promote walk-ability and therefore have defined edges and centers.
- Corridors form neighborhood boundaries. These corridors can be natural features or infrastructure, can connect neighborhoods, and can define specialized districts.
- Disciplined execution of human-scale building proportions honor and embellish the street.
- A range of transportation options must be given equal emphasis in order to provide realistic options for the user.
- Street networks, with functional hierarchy of uses, provide the greatest possible option of routes and relieve traffic congestion.
- Civic buildings are given priority when it comes to site selection and reinforce symbolic importance as landmarks in preferred areas, such as neighborhood centers or town squares.

These principles lay the foundation for the New Urbanist vision of potential urban revitalization (3.03).



### SIGNIFICANCE

New urbanist thought offers insightful lessons that can be applied to the context and needs of the Bubny site in Prague. While many of the new urbanist ideas are already commonplace in the older pre-automobile districts of Prague there are helpful strategies that could be utilized to create a contemporary walkable urban fabric in the post-industrial center of Prague 7.



(3.E)

### WALK-ABILITY

Many compact urban fabrics depend on walkable connectivity in order to truly thrive, Prague is no exception. By providing a strategically connected network of public transit, bicycle infrastructure, and walkable linkages the foundation for a prosperous urban fabric will be established.

### NEIGHBORHOOD STRUCTURE

Having a high range of uses within a 10-minute walk will help establish a sense of neighborhood. Neighborhoods, being the building blocks of cities, are essential and careful consideration to the positioning of features can ensure a viable and engaging sense of place.

### INTEGRATION OF SPACES

In order to maintain a dense urban fabric, spaces should be integrated to provide for the various needs of the community. Micro-scale interplay between private and public, commercial and residential, built and green spaces can create intimate atmospheres for community growth.

## NEW URBANISM: DESIGN IMPLICATIONS

Applicable and appropriate design implications can be derived from New Urbanism and help inform and structure the master plan design for the Bubny site. While a strict New Urbanist approach might be unnecessary given the context of the site, there are a few key principles that will serve as a strong foundation for a successful design.

Walk-ability is of the utmost importance. In order to discourage the use of the private automobile and all of its resulting social and environmental degradations, careful attention to circulation and scale must be considered. Traditional neighborhood structure, as translated and defined by the New Urbanists, provides useful insight when allocating space for public and private functions. Although the transect method of high density center dissolving outwards into rural agricultural land might not be applicable to the Bubny site, the micro scale of centering commercial and civic functions within public and open space is quite fitting for Bubny. The integration of spaces is another necessary design implication in order to maintain a dense urban fabric that provides a range of services to the user. This integration can be seen in the Old Town of Prague and it would be foolish to ignore the success of this place-making tactic. Finally, maybe the most important implication of New Urbanism would be the maximizing of mixed use urban fabric. A truly dynamic and livable community is dependent upon a large selection of features and utility in a compact and walkable environment. Communities thrive when citizens can fulfill their needs and engage at a local level.



(3.F)

### MAXIMIZING MIXED USE

Although New Urbanism is somewhat contradictory in its attempt to create mixed use communities as well as "commercial districts", the idea to maximize mixed use remains a strong and viable factor for the context of the Bubny site. Mixed use is a resilient approach to placelessness.





## NEW URBANISM: VAUBAN

### THE CITY OF FREIDBURG, GERMANY

Within the scope of influence of New Urbanism theory exists the Sustainable Model District Vauban in the city of Freiburg, Germany – a globally recognized prototype for contemporary sustainable urban development. District Vauban has taken somewhat radical approaches towards mitigating energy usage as well as embracing and working towards a car-free community. These goals are inspiring, especially considering the task at hand for the redevelopment of Buby, and hopefully the strategies and practices of District Vauban can lend their influence to a more sustainable master plan.

District Vauban is located on an historic military base 3 km from the center of Freiburg. The entire district is owned by the City of Freiburg, which develops and sells the building lots. The project began in 1995 with the initiation of participation structures and the formation of working groups. The first master plan was completed in 1996 and the first lots were sold to co-housing projects the following year. The process





has continued up to the present, learning from itself the entire way. This community participation and the lack of a large universal investor has cultivated a strong sense of community culture, with citizens working through the growing pains of bureaucracy in order to form a meaningful atmosphere of cooperative action.

The key take-away points from District Vauban are the effectiveness and viability of “zero energy” and “plus energy” standards, referring to homes that produce surplus energy, the clustering of homes to increase energy efficiency and social integration, the use of passive solar principles, and the use of an on-site co-generation plant (CHP) which burns wood-chips and natural gas. These strategies coupled with the radical mobility approach entail a more cohesive and holistic approach to sustainability. Regulations prohibit parking spaces near private property. All cars are parked in a community car park and speed limits are reduced throughout the development. Service vehicles and pickup/drop off is allowed. The reduction of automobile emphasis frees up space and uses for people and community interaction. (3.04)



## NEW URBANISM: SOUTHEAST FALSE CREEK DEVELOPMENT

VANCOUVER, BRITISH COLOMBIA / PWL PARTNERSHIP

Southeast False Creek is situated along a coastal post-industrial site in the city of Vancouver. The site's past uses included shipbuilding, warehousing, foundries, and the city's public works yard. Left vacant after the lingering exodus of industry starting in the 1960's, the Southeast False Creek area had left a scar on the urban fabric and environment of Vancouver. Spurred by the economic stimulus of the 2010 Olympics, Southeast False Creek was slated to become a leading example in sustainable urban development – a goal that would result in becoming the world's second neighborhood to achieve the LEED platinum standard in 2011.

Southeast False Creek has implemented a "public realm guide" which functions as a design manual considering how to acknowledge historic uses in sustainable fashion. Derived from this plan, the entire site is connected by open spaces, plaza, streets, lanes and pathways in order to foster a socially and environmentally sustainable user experience. In addition, the development has embraced a building strategy, which require that all buildings meet environmental baselines (3.05).





In 2013, the parks and waterfront at Southeast False Creek received the Urban Open Space Award for its successful integration of viable landscape strategies. The entire site is structured as a “continuous park” which allowed for the city of Vancouver to approach the project with long term and large-scale environmental restoration and urban place-making in mind. The once toxic shoreline was re-envisioned to increase inter-tidal fish habitat and in 2008, success of this intervention was made evident when herring returned to the site to spawn. The site has many soft natural features that are habitat for fish and native waterfowl (3.07).

Overall, Southeast False Creek Development exemplifies the use of New Urbanist approach to built form and structure while embracing the importance and significance of natural systems and green infrastructure – a move often more associated with Landscape Urbanism.

Participation and the lack of a large universal investor has led towards a strong sense of community culture, with citizens working through the growing pains of bureaucracy in order to form a meaningful atmosphere of cooperative action.







## LEED NEIGHBORHOOD DEVELOPMENT

The LEED Neighborhood Development (ND) is a "ready-made set of environmental standards for land development (NRDC)." The guidelines are broken into three main categories: location and linkage, pattern and design, and green infrastructure. This set of guidelines is put in place to ensure that someone developing a neighborhood will promote qualities of walk-ability, create a sense of place, allow for social cohesion, and establish socio-economic stability. Neighborhoods that have access to public transit, mixed use buildings, reduced parking, walkable streets, and shared community spaces are likely to have a very high LEED ND ranking.

"LEED-ND recognizes development projects that successfully protect and enhance the overall health, natural environment and quality of life in communities. The rating system encourages smart growth and New Urbanist best practices by promoting the location and design of neighborhoods that reduce vehicle miles traveled and creating developments where jobs and services are accessible by foot or public transit. It also promotes an array of green building and green infrastructure practices, particularly more efficient energy and water use." (3.07).

### FOSHAN LINGNAN TIANDI DEVELOPMENT

This project, located in Foshan, China is a Gold certified LEED ND project. The aim of the design team was to create a "socially vibrant, ecologically restorative, economically sound community." The master plan incorporates space for office, retail, entertainment, and leisure. The design is strongly focused around walk-ability and community, and as such, the master plan required "a minimum of 50% of dwelling units to be within 800m walking distance of at least 10 of different use types." On top of this, the project collects rainwater for irrigation, utilizes native plants for low water consumption, and incorporates solar panels to provide power for lighting throughout the site (3.08).

### DESIGN STRATEGY

- Choose an Environmentally Sound Location.
- Reduce the Need to Drive.
- Use Less Land to Create More Benefits.
- Conserve Energy, Water and Other Natural Resources.







(3.P)

## LANDSCAPE URBANISM

### LANDSCAPE AS FOUNDATION FOR URBANISM

Landscape Urbanism is a contemporary theoretical discourse with practical implications that argues for greater sensitivity to landscapes when it comes to developing and growing cities. Common emphasis on built architectural form is reconsidered as complimentary to landscape-scale features such hydrology, topography, connected open spaces, and dynamic and temporal ecological systems.

*"Today, however, it is not merely an interest in vegetation, earthworks, and site-planning that we see espoused in various schools of design and planning, but also a deep concern with landscape's conceptual scope; with its capacity to theorize sites, territories, ecosystems, networks, and infrastructures, and to organize large urban fields. In particular, thematics of organization, dynamic interaction, ecology, and technique point to a looser, emergent urbanism, more akin to the real complexity of cities offering an alternative to the rigid mechanisms of centralist planning."*

— James Corner, "Terra Fluxus"

Landscape Urbanism is often considered in large-scale remediation and brownfield revitalization projects due to its sensitivity toward natural systems and the "conceptual scope" that questions and works within the critical assessment of nature and urbanity. Given the size and relevance of landscape on the post-industrial Bubny site, the dialogue of Landscape Urbanism presents intriguing ideas of flexibility and integration that counter the rigid form of New Urbanism. These two predominant theories can be synthesized, borrowing ideas from one another to elevate the authenticity of New Urbanism while offering grounding practicality to the often conceptual Landscape Urbanism (3.09).

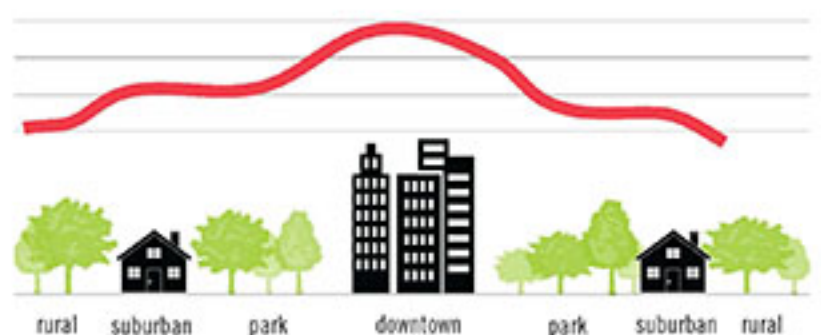




## LANDSCAPE URBANISM: DESIGN IMPLICATIONS

While Landscape Urbanism engages in a post-postmodern discourse of urbanism the prominent ideas can be simplified into four guiding principles:

- **Process over time** – If seriously using landscape as the foundation for urban design, the design must embrace the dynamic fluidity of natural processes and acknowledge and anticipate change – both environmental and social.
- **Horizontality** – Designs should embrace the horizontal plane and reconsider the emphasis on vertical structuring.
- **Working Methods + Techniques** – Practitioners of Landscape Urbanism must be able to adapt to the environment and context in which they practice.
- **The Imaginary** – Landscape Urbanism promotes creative problem solving and interdisciplinary discourse in order to form new relationships and exceed the status quo of urban thinking. By acknowledging the limitless possibilities of the imaginary, urban design can surpass the failings of the twentieth century.



urban heat island profile

(3.R)

## CLIMATE CHANGE + GREEN INFRASTRUCTURE

The UK Engineering and Physical Sciences Research Council and the UK Climate Impacts Programme established a project to study strategic planning and urban design methods (in this case, green infrastructure) to mitigate potential impacts of climate change on urban areas. Urban areas have unique “biophysical features” that are the result of human building practices. The urban heat island effect and increased rates and volumes of storm water runoff can be attributed to changes in the urban surface. Impermeable surfaces and structures interfere with natural ecosystem functions such as solar and water absorption. It is assumed that climate change will magnify the problems associated with the impairment of the natural processes that mitigate weather effects. This study examined the impacts green infrastructure can have in mitigating the effects of increased urban temperatures and increased urban runoff. “Urbanization replaces vegetated surfaces, which provide shading, evaporative cooling, and rainwater interception, storage and infiltration functions, with impervious surfaces.” However, green spaces (and green infrastructure) within urban settings can allow for greater benefits from ecosystem services. “The green infrastructure is ‘an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations’ (Benedict and McMahon, 2002). The green infrastructure should operate at all spatial scales from urban centres to the surrounding countryside (URBED, 2004).”

The analysis focused on Manchester, England and utilized 1961–1990 temperature data as a baseline compared to projected 2080 models. As expected, increased green cover moderates average urban temperatures. The study found regarding urban temperatures:

“Adding 10 percent green cover to areas with little green, such as the town centre and high-density residential UMTs keeps maximum surface temperatures at or below the 1961–1990 baseline temperatures up to, but not including, the 2080s High emissions scenario.

### DESIGN IMPLICATIONS

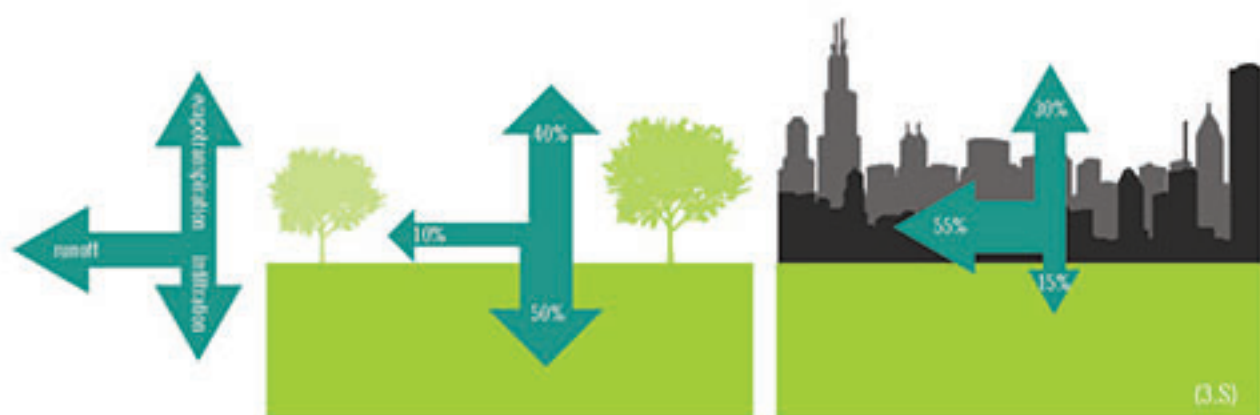
**Economic:** Potential to raise property values

**Socio-cultural:** Health benefits

**Functional:** Addresses storm-water runoff management

**Environmental:** Mitigation of heat island effect

**Aesthetic:** Increased green areas



"Adding green roofs to all buildings can have a dramatic effect on maximum surface temperatures, keeping temperatures below the 1961-1990 current form case for all time periods and emissions scenarios. Roof greening makes the biggest difference [in urban areas] where the building proportion is high and the evaporating fraction is low. Thus, the largest difference was made in the town centres followed by manufacturing, high-density residential, distribution and storage, and retail.

The study also noted that:

"Increasing green cover by 10 per cent in the residential UMTs reduces runoff from these areas from a 28 mm precipitation event, expected by the 2080s High, by 4.9 per cent; increasing tree cover by the same amount reduces the runoff by 5.7 percent, and:

"Adding green roofs to all the buildings in town centres, retail, and high-density residential UMTs significantly reduces runoff from these areas. The effect is greatest where there is a high building cover. When green roofs are added, the runoff from an 18 mm rainfall event for these UMTs is reduced by 17.0-19.9 per cent. Even for the 28 mm event runoff can be reduced by 11.8-14.1 per cent by adding green roofs.

The implementation of green infrastructure methods and tools is a viable option to deal with the issues associated with climate change, namely increased urban temperatures and increased runoff flows. However, the study asserts that the 'greening' of urban areas can be problematic due to the extent and intensity of the existing built environment. Thus, "creative" means are necessary and the importance of "the greening of roofs, building facades, and railway lines, street tree planting, and converting selected streets into green-ways" should not be underestimated. Furthermore, "[p]riority should be given to areas where the vulnerability of the population is highest. A study in Merseyside found that vegetation, and in particular tree cover, is lower in residential areas with higher levels of socio-economic deprivation." (3.10)

The study discusses other strategies to implement green infrastructure features such as drought tolerant trees, irrigation through rainwater harvesting, reuse of gray water, and floodwater storage. Tools to accomplish these objectives include bioswales, infiltration, detention, and retention basins. Furthermore, "[o]pportunities to enhance the green cover should also be taken where structural change is taking place, for example, in urban regeneration projects and new development."

The study concludes by acknowledging that urban areas with the lowest populations of trees (especially mature trees) demonstrate the highest propensity for socio-economic disadvantage.

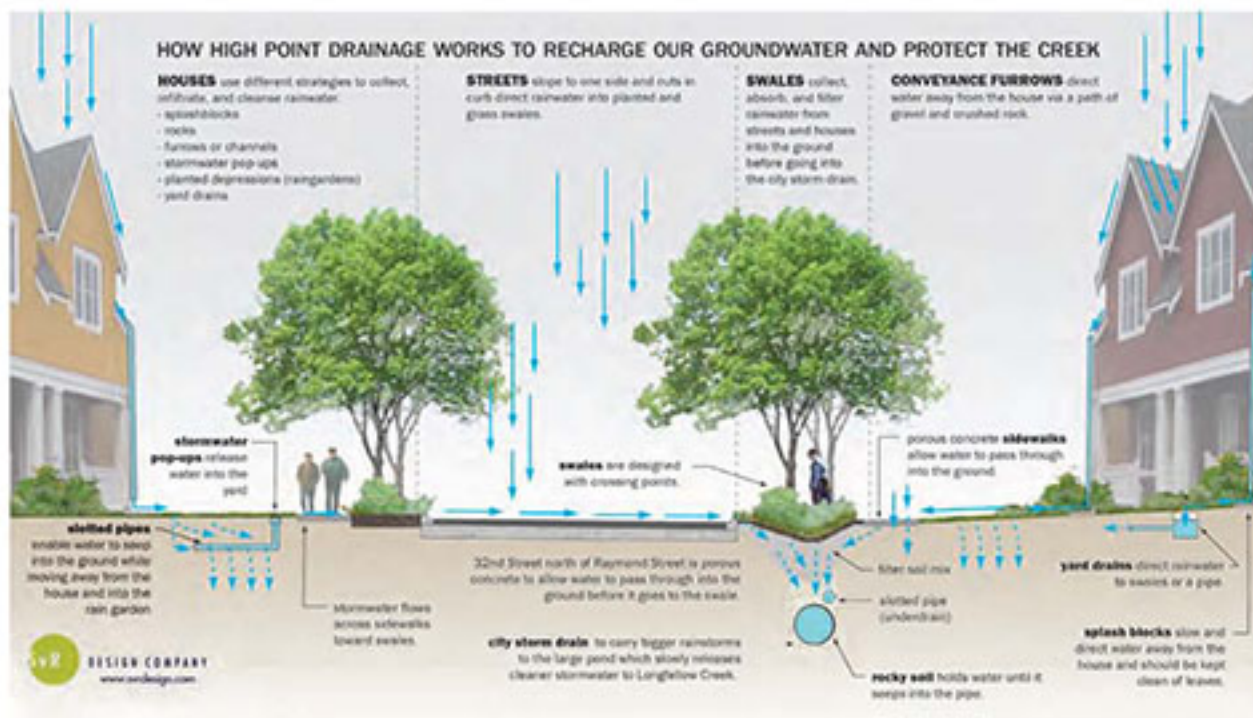




## HEALTHY STREETS

Urban runoff from storm events adds to flooding and pollution of watersheds. Remediation strategies to treat and clean this water and allow it to percolate back into the ground include bioretention features, creating more green space, and increasing pervious surfaces by narrowing existing roadways, all while filtering out the pollutants picked up from the pavement. Bioretention basins “allow 30% more water to soak into the ground compared to a patch of traditional lawn.” While rooftops contribute impervious surfaces to the urban environment, the surfaces used by vehicles are the greatest contributor. “[T]otal runoff volume for a one-acre parking lot is 16 times the amount produced by an undeveloped meadow.” Studies have strongly correlated the amount of pollutants in waterways to the proportion of impervious surfaces in the watershed. The use of retention ponds and wetlands has been proven to increase the time of concentration and act as an “effective method of particulate matter removal.” The benefits of these strategies of storm-water runoff treatment features are threefold: retention and treatment, increased biodiversity, and aesthetic beauty.

Combining wetlands and bioswales with enhanced urban forests compounds the value of each. Contact with nature has been shown to benefit the mental and physical health of area residents. Besides cooling the urban environment and filtering air, trees “have been shown to calm traffic, both by reducing the speed of drivers and also reducing the frequency and severity of crashes.” Trees and bioswale-like features can act like buffers between pedestrians, cyclists, and vehicles on roadways. Furthermore, a healthy urban forest may provide economic benefits as well. “[D]ata collected on trees and sidewalk gardens were found to increase residential property values in Portland, OR and increase revenues in inner-city shopping districts.” (3.11).



(3.U)



(3.V)

#### DESIGN IMPLICATIONS

Economic: Cost effective technique

Socio-cultural: Creation of gathering spaces within green infrastructure

Functional: Runoff mitigation and improved pedestrian safety

Environmental: Permeable streetscape and human thermo comfort





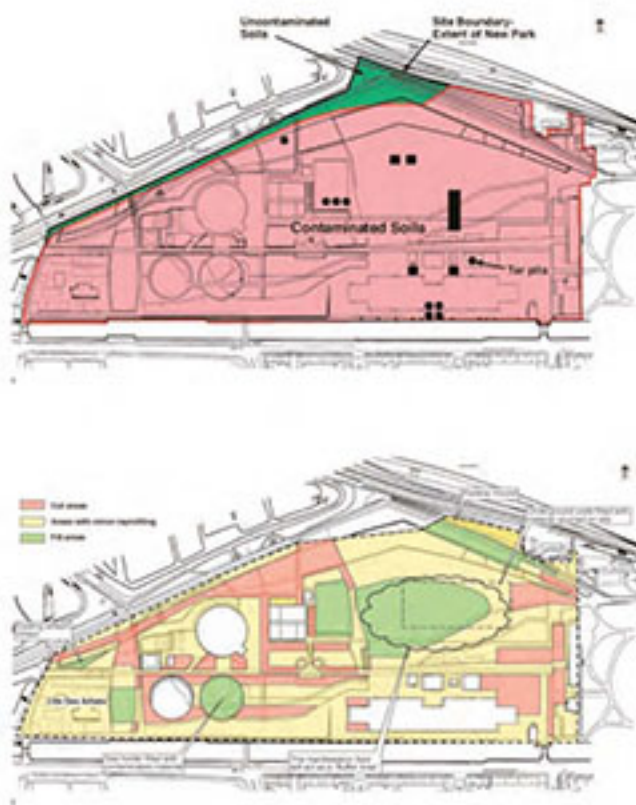
## BROWNFIELD REMEDIATION STRATEGIES

### SITE REMEDIATION

Remediation of contaminated soils is often an important part of the redevelopment process of former industrial sites. The growth of industry and the lack of knowledge regarding their pollution potential allowed for little to no practices aimed at preventing the distribution of industrial substances that have proven to be detrimental to people and the environment. Many areas that experienced significant industrial activity in the early 20th century are now contaminated to the point where any redevelopment requires soil and/or groundwater remediation. The Bubny site is no exception, although the soils are not assumed to be as contaminated as many other former industrial areas.

The remediation process depends on future planned use of the site in question. Residential sites, for instance, require higher standards than commercial sites. Several soil remediation approaches include excavation and disposal, containment, soil vapor extraction, phytoremediation, and microbial remediation. Excavation and disposal is a good option when excavation is planned as part of the design. After the soil is treated it can be returned to the site or moved to a new location. Containment is a good approach when dealing with large and/or complex contamination but can limit future use and often requires diligent monitoring. Soil vapor extraction is a suitable technique when contaminants have remained above the water table; wells are drilled throughout the contaminated area that allow the VOC's to escape. Phytoremediation involves the use of plants that break down or absorb pollutants--however, the contaminated plants must then be disposed of. Microbial remediation involves the introduction of microbes which accelerate the natural degradation of hydrocarbon based contamination (3.12).



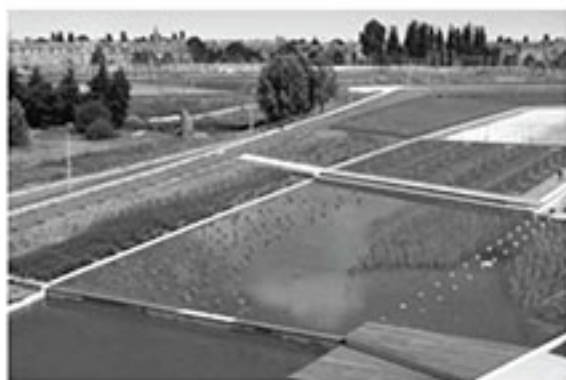


(3.X)

## BROWNFIELD REMEDIATION: CULTUURPARK WESTERGASFABRIEK

AMSTERDAM / KATHRYN GUSTAFSON

The current park's 13 ha site had been the largest gasworks facility in Amsterdam from the late 19th Century until the early 1960's. Gas was manufactured on-site - a process that left a legacy of contaminants in the soil including heavy metals, volatile organic compounds, and benzene. Due to the prohibitive costs associated with the prescribed remediation technique of excavation and off-site disposal, the site lay in limbo for 30 years. The government then decided that a more cost-effective approach was to Isolate, Control, and Monitor (ICM) the soil on-site. This strategy specified the addition of a layer (asphalt) to cap the contaminated soils and eliminate exposure. This approach was seen as not conducive to the site of a future park. Another proposal was put forward calling for the tilling of contaminated soils so the cap would have a reduced footprint and allow for areas of planting and topography. This hybrid approach was still deemed cost prohibitive. The final solution was determined to be based on the fact that "one meter of clean soil could serve as an isolation layer, as long as it was placed where the contaminated ground water could not rise high enough to contaminate the clean layer of soil." A membrane layer was placed under the planting soil layer, also allowing for the retainment of many existing mature trees.



Utilization of the ICM and tilt methods led to a situation where "topography was created by the carefully balanced cut and fill of contaminated soils. Soil was cut from the area around the buildings and the excavation of the canal, where paving would be placed. The contaminated soil that was covered with clean soil and contoured such that the placement of the clean soil, with depths required for the different plant types, would result in a smooth topography, hiding the artificial condition below and economizing the use of clean soil." (3.13).

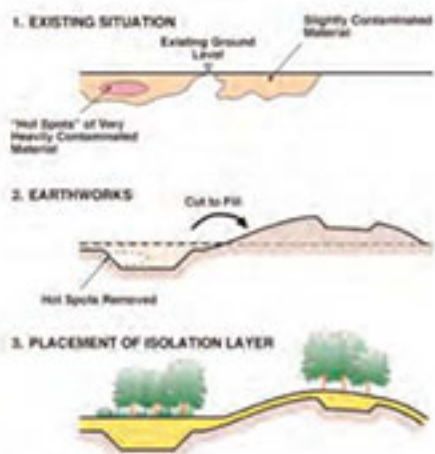
"The strategy allows for the careful internal manipulation of contaminated soil into a complex system that serves multiple operational goals as well as creating an attractive topographical landscape."



(3.2)



(3.AA)

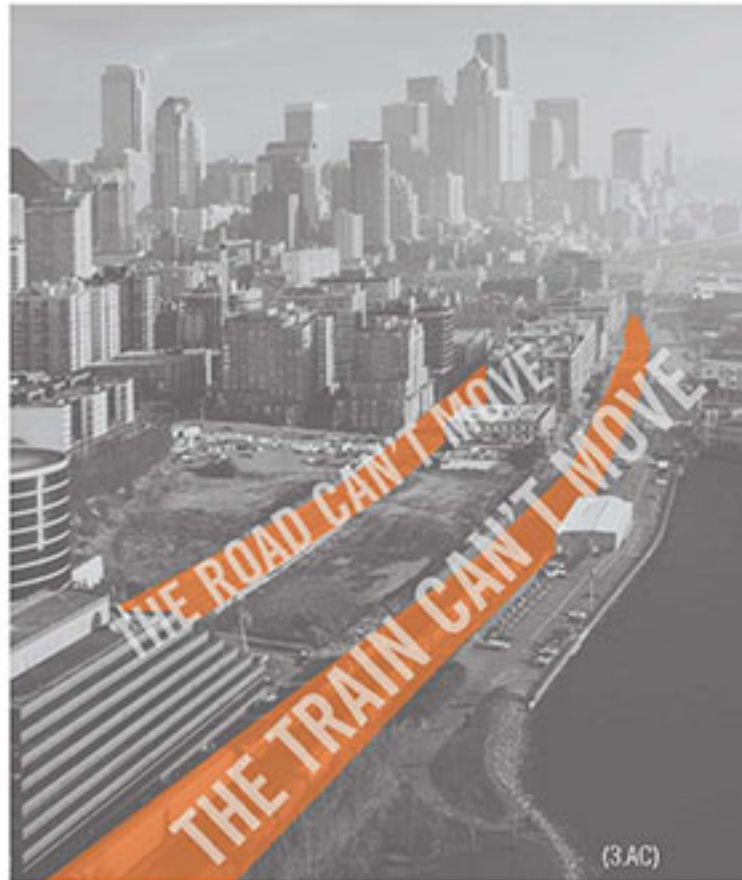


(3.AB)

#### DESIGN IMPLICATIONS

Economic: Cost effective technique  
 Socio-cultural: Reclamation of derelict area for local residents  
 Functional: Circulation and parking needs aligned to subsurface issues  
 Environmental: Isolation of toxins  
 Aesthetic: Creation of topographically interesting area





## OLYMPIC SCULPTURE PARK

SEATTLE, WASHINGTON / 2007 / WEISS/MANFREDI + ARCHITECTURE/LANDSCAPE/  
URBANISM

The site for this project was on the last undeveloped waterfront property in Seattle. The site was once used as an oil transfer facility and is divided by train tracks and an arterial road. The designers envisioned this industrial brownfield as "a new urban model for sculpture parks".

The sloping, Z-shaped green platform connects three sites divided by unmovable transportation cores, "reconnecting the urban core to the revitalized waterfront".

There is a forty foot grade change from the far end of the site to the waterfront. "The first stretch crosses a highway, offering views of the Olympic Mountains; the second crosses the train tracks, offering views of the city and port; and the last descends to the water, opening views of the newly created beach".

As the path descends to the waterfront, the user experiences three distinct environmental conditions. The first is an evergreen forest, the second is a deciduous forest and the last is a shoreline garden with "tidal terraces for salmon habitat and saltwater vegetation" (3.14).

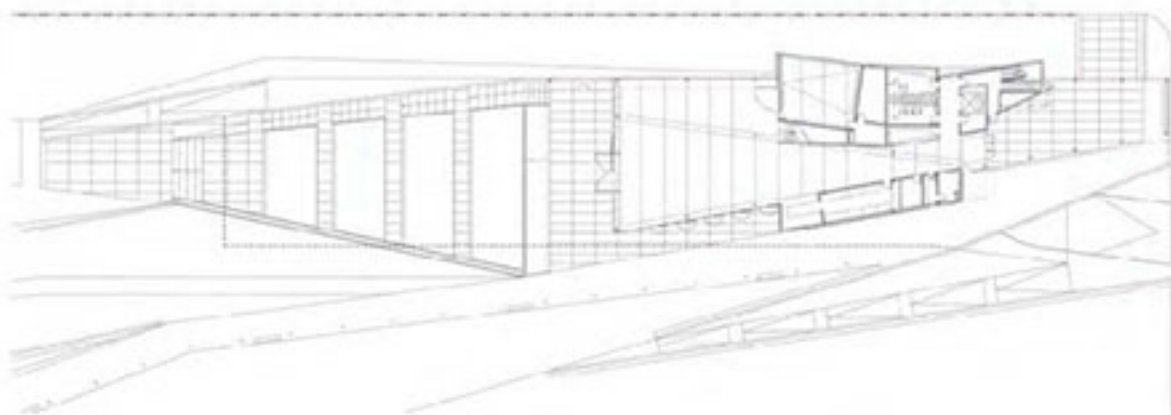


(3.4D)





(3.AE)

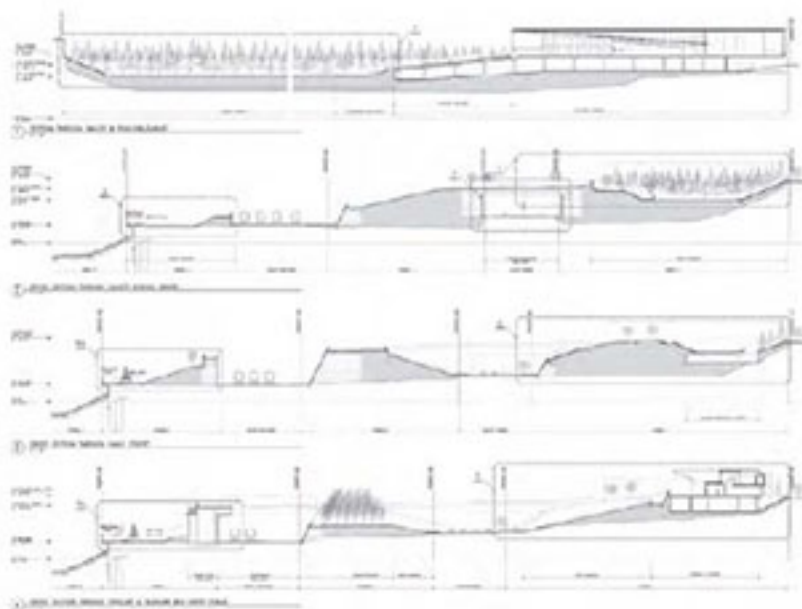






(3.AF)

ABOVE  
The sculpture park on opening day





## THE PLANT

### CHICAGO, ILLINOIS / 2010-PRESENT

This building was purchased in 2010 for only \$5 a square foot under the assumption that it would be stripped of reusable material then torn down to make way for new construction. Instead, the company Bubbly Dynamics, LLC has turned the former 93,000 sf meatpacking building into a net zero food factory, business incubator, and education center for this Chicago neighborhood.

The heart of the building is in the anaerobic digester, which takes food and human waste and turns it into biogas and fertilizer for algae and plants. The gas powers a generator which runs the grow lights for the plants. The plants, which use the light and the fertilizer from the digester are grown for food, producing oxygen and cleaned water for the fish.

The fish and the plants are used in the commercial kitchen that is run by the members of the local community. Leftover waste is returned into the system to eventually become food once again.

Waste is collected from neighboring buildings as well, and once the building remodeling is complete, the anaerobic digester will be able to produce enough energy to heat and cool nearby buildings as well. The Plant will create 125 jobs in a low economic neighborhood of Chicago. (3.15)

### SIGNIFICANCE

The Plant uses an old industrial building inside an dense urban area. It uses a complex and closed loop system designed to provide all its energy needs all while producing fish, food, beer, tea, and jobs for the local community.

### THE PLANT SYSTEM

The diagram on the opposite page shows the cycle of production for The Plant. Drawing traced from an original diagram by Matt Bergstrom.

### DESIGN IMPLICATIONS

**Economic:** 125 jobs created

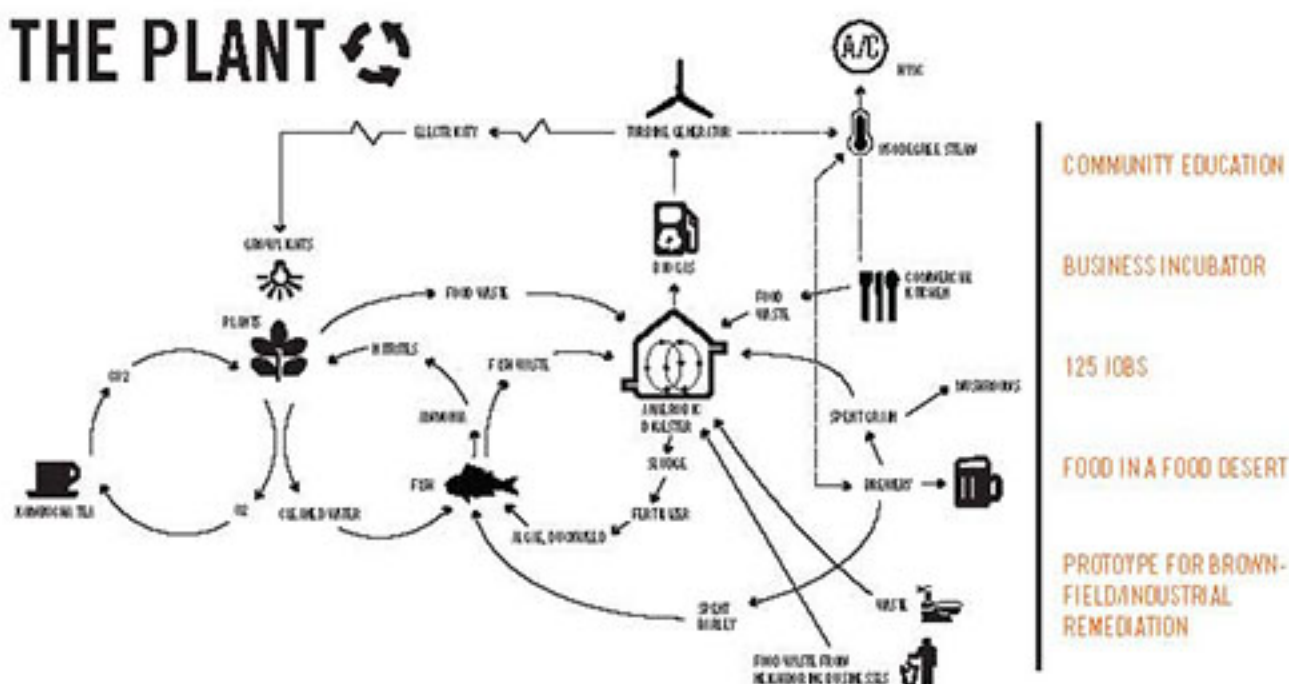
**Functional:** Provides its own electricity and electricity for neighbors, converts waste to energy

**Environmental:** Net zero, closed-loop system that reduces energy consumption and waste

**Aesthetic:** Turns old rundown building into a thriving, green center of the community



# THE PLANT







## BROWNFIELD REMEDIATION: STATION SQUARE

### STATION SQUARE, PENNSYLVANIA

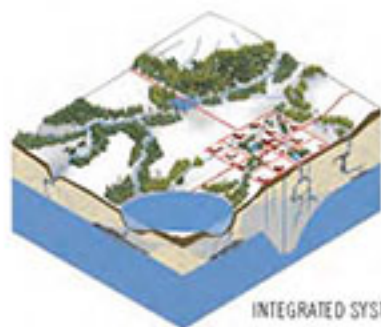
Station Square is a 40-acre former railroad and coal freight facility that was operational from 1879 to the 1970's. The site consisted of a terminal, an extensive freight station, a 7 story warehouse, an express house, and several minor buildings. In 1976 a mixed-use historic adaptive reuse approach was adopted and in 2002 the project was completed with a hotel expansion and the addition of a destination entertainment district, complete with restaurants and specialty shops. The site's industrial history is celebrated through the preservation and reuse of several landmark buildings including the terminal train station which houses restaurants and office space, and a train shed that has been repurposed into a retail area. In addition, the redevelopment took advantage of the site's adjacency to the river and now offers boat slips, recreation opportunities, and water access to the site (3.16).

#### DESIGN IMPLICATIONS

The successful redevelopment of a former industrial railroad site took advantage of its location on a river and created new uses for several historically important buildings.



GREENWAY



INTEGRATED SYSTEM



DETENTION POND



SKINNY STREET

(3.11)

## ECOLOGICAL STORM-WATER MANAGEMENT

This is a type of system that mitigates storm-water runoff through the use of the landscape rather than hard surfaces and engineered methods. This type of management system is beneficial for many reasons. For one, it can save money on a project by not having to put in traditional storm-water infrastructure. It can also create habitat and public green space, and prevent flooding.

Some of the most common design elements for this type of system are greenways or greenbelts, rain gardens, skinny streets, detention ponds, retention ponds, and riparian buffers (3.17).

Some of the ecosystem services they can offer include (UACDC):

- |                           |                             |
|---------------------------|-----------------------------|
| 1. atmospheric regulation | 8. waste treatment          |
| 2. climate regulation     | 9. pollination              |
| 3. disturbance regulation | 10. species control         |
| 4. water regulation       | 11. refugia/habitat         |
| 5. erosion control        | 12. food production         |
| 6. soil formation         | 13. raw material production |
| 7. nutrient cycling       | 14. recreation              |
|                           | 15. cultural enrichment     |

### DESIGN IMPLICATIONS

**Economic:** Save money on construction cost. Increase property value of nearby buildings.

**Socio-cultural:** Public Open Space

**Functional:** Manages large scale rain events

**Aesthetic:** Creates more viewsheds

**Environmental:** Build soil, create habitat, regulate climate, increase biodiversity



## STORM-WATER RUNOFF MITIGATION

PENNSWOOD VILLAGE, PENNSYLVANIA / 1999

This 82 acre retirement community was expanded in 1999 with a large part of the project dedicated to addressing traffic safety and storm-water management issues. "The sinuous topography mimics the function of a natural riparian stream corridor channel, managing not only the site's runoff, but also that of adjacent properties and the highly developed outlying watershed areas. Swales, wetlands, and meadows with carefully selected native grasses, shrubs and trees slow runoff, create a pollutant removal train, and recharge groundwater, as well as create a place of serene beauty." (3.18).

### FEATURES:

- 13 acre wetland with meadows and bioswales treat both on and off-site runoff
- ADA paths were constructed throughout the system to allow for recreation and relaxation
- The system includes a stone-lined sedimentation basin with a weir of boulders, which increases the water's time of concentration while settling out heavier particles and collected trash (it is buffered so as not to be visible)
- Water then flows through a grass swale that parallels the entrance road
- Next the runoff flows into an infiltration basin of highly permeable soils
- If the infiltration basin overflows, the water moves into a vegetated swale
- This swale is between a meadow of native grasses, shrubs, and trees into which excess runoff can be absorbed
- Lastly, the runoff arrives at a 'constructed treatment wetland' and wet pond

### FACT

"The cost of maintaining the 20-acre wetland meadow landscape is approximately \$7,000 per year, substantially less than the \$54,000 annual cost of maintaining an equivalent area of traditional lawn with ornamental plantings."

### DESIGN IMPLICATIONS

**Economic:** Cost savings

**Functional:** Addresses both on and off-site runoff

**Environmental:** New habitat, ground water recharge

**Aesthetic:** Creation of riparian corridor







BUILDING SECTION PERSPECTIVE

- 1 PHOTOVOLTAIC COLLECTORS
- 2 METAL ROOF
- 3 CONSTRUCTED WETLANDS
- 4 AERATED LAGOONS
- 5 WOOD RAINDRAIN SING
- 6 SOLAR TRACKING SKYLIGHTS
- 7 SUNSHADE
- 8 MECHANICAL AND ELECTRICAL ROOM
- 9 INTERIOR FINISHES
- 10 WOODLANDS RESTORATION

## ALTERNATIVE WATER TREATMENT

Ecological Wastewater treatment is a means of treating sewage and domestic water waste through a series of biotic events. These are typically referred to as “Eco-Machines” or “Living Machines.” Living Machines are a product of Worrell Water Technologies and is one of the most common systems in place.

The system provides a lasting water solution by effectively treating and reusing wastewater through a series of wetland cells. These cells are filled with optimized gravel, which promotes the growth of a micro ecosystem, resulting in high quality reusable water. Water is first pumped into a tank where debris settles and degrades, then water flows into an equalization tank which determines the release into specially engineered gravel, sand, and plant boxes (wetland cells).

Following this, different cells with different organisms eat and purify the black or gray water in order to remove the microscopic sediment. The water is then treated with ultraviolet light and is lightly chlorinated to meet suitable standards.

This strategy for wastewater treatment provides an opportunity for on-site water reuse and creates a living laboratory with educational opportunities. It also produces high quality water that can be used to flush toilets, supply cooling towers, irrigation, and other non-drinkable situations.

Attractive and effective foliage can be integrated in the interior and exterior of public spaces and the energy efficient design enables lower operation and maintenance costs. Overall, the technology has a smaller physical footprint and a lighter carbon footprint in regards to traditional waste water management (3.19).

### OMEGA CENTER

Treats 52,000 gallons of domestic wastewater a day. Utilizes constructed wetlands and aerated aquatic greenhouse tanks.

### DESIGN IMPLICATIONS

**Economic:** Saves money on water costs for irrigation.

**Socio-cultural:** Creates educational opportunities.

**Functional:** Treats black and gray water.

**Environmental:** Increases biodiversity, minimizes carbon footprint, and conserves water.

**Aesthetic:** The use of aquatic plants and wetland species creates rich atmosphere.









## URBAN FORESTRY

Trees have an enormous impact on the urban environment. They can have significant value environmentally, economically, and educationally. Forests help clean air pollution, provide wildlife habitat, provide shade in the hot summer months and windbreaks in the cold winter months, and reduce storm-water runoff. They provide economic benefits by increasing property values and providing resources such as lumber and other organic materials. On top of this, they have an educational value in that they can be used to teach people about forest ecology (3.20).

### QINHUANGDAO FOREST PARK-II

In 2011, Turenscape began working on a project in Qinhuangdao, Hebei Province, China. Their brief was to take an abandoned tree plantation and revitalize it into an urban forest park. Turenscape was able to achieve this while also providing multiple ecosystem services to the city. The park now provides recreational space for people, habitat for wildlife, storm-water management through ponds, and food production for nearby residents (3.20).

### DESIGN IMPLICATIONS

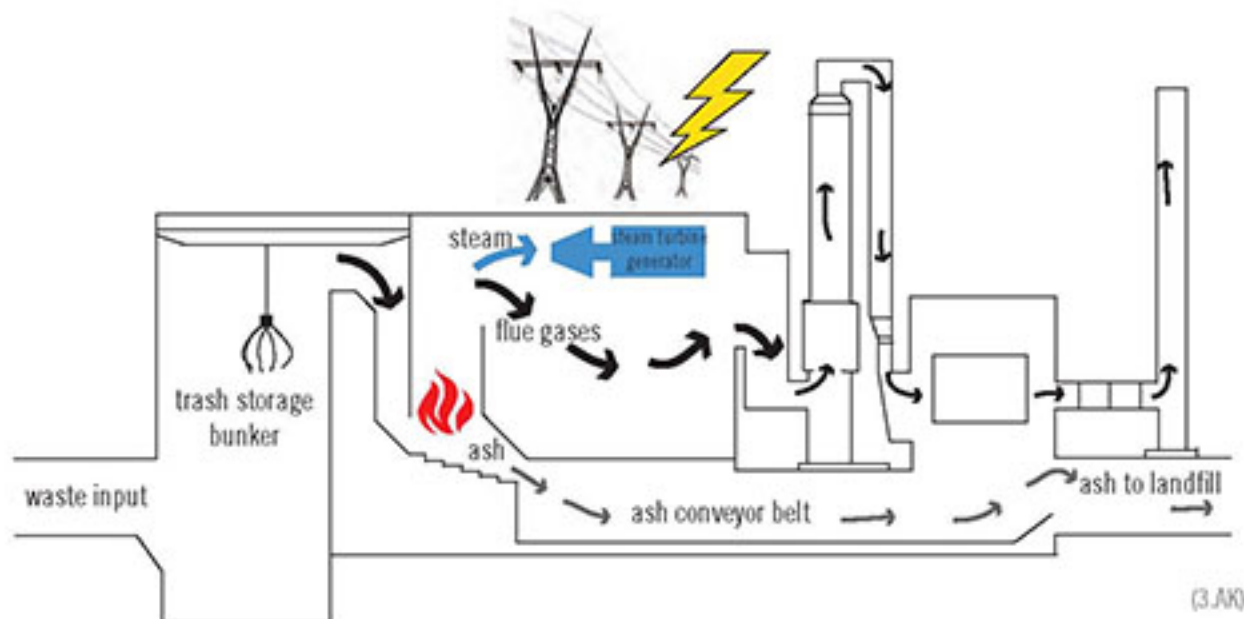
**Economic:** Jobs through agriculture and aquaculture

**Socio-Cultural:** Recreational space for people to gather and meet

**Functional:** Defined circulation

**Aesthetic:** Cohesive design with use of materiality

**Environmental:** Increased biodiversity



## WASTE-TO-ENERGY

A waste-to-energy plant in Portland, Maine converts unrecyclable trash into electricity which is then sold. Trash is brought to the plant by trucks and then burned at 2,000 degrees creating steam which turns electricity generating turbines. This plant turns approximately 175,000 tons of trash into slightly more than 100,000 megawatt-hours of electricity annually (services about 14,000 houses). (3.21).

Aside from reducing landfill input by as much as 90% (the ash is put in landfills), the plant creates jobs and produces revenue. A 2011 study commissioned by the Maine Waste-to-Energy Working Group analyzed the state's four waste-to-energy facilities contribution to the economy. It found that these facilities contributed roughly \$137 million to the state economy, provided 228 jobs for workers and 369 full and part time jobs through multiplier effects for a total of 597 jobs, and almost \$20 million in wages, salaries, and benefits, and nearly \$34 million in total labor income impact accounting for the labor income multiplier (3.22).

### DESIGN IMPLICATIONS

**Economic:** Creation of jobs  
**Functional:** Reduction of waste to landfill  
**Environmental:** Potential reduction in site's carbon footprint



#### OVERCAST DAY

The brightness on an overcast day is typically three times greater at the sun's zenith than at the horizon



#### SUNNY DAY

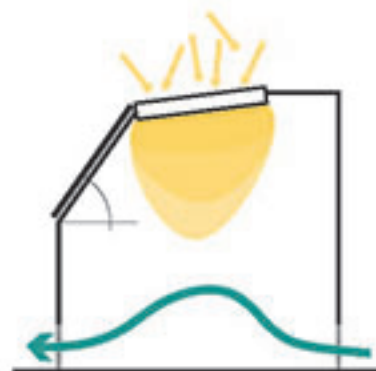
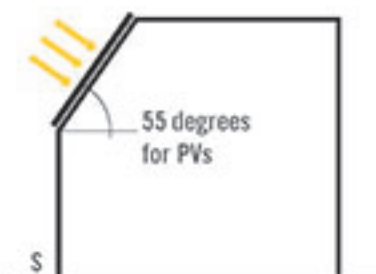
The brightness on a sunny day is typically ten times greater near the sun's position than at the darkest part of the sky

(3.23)

#### SIGNIFICANCE

If during the winter, the brightest sky is at the zenith, then skylights make sense for winters in Prague.

But, due to the heat in the summer, these sky-lit areas should either be operable or have natural ventilation along the sides to flush out trapped hot air.



SUMMER

(3.A5)



## ARCHITECTURAL DESIGN STRATEGIES

### CONDITIONS IN PRAGUE

Prague has a temperate, cool and humid climate. It is characterized by high humidity throughout the year and an average of 52cm of precipitation per year. Prague is in the rain shadow of the Sudetes with most of its rainfall occurring in the summer months. The winters in Prague are cold with very little sunshine and with little snowfall. The summers are temperate with a lot of sunshine.

### DESIGN PRIORITIES

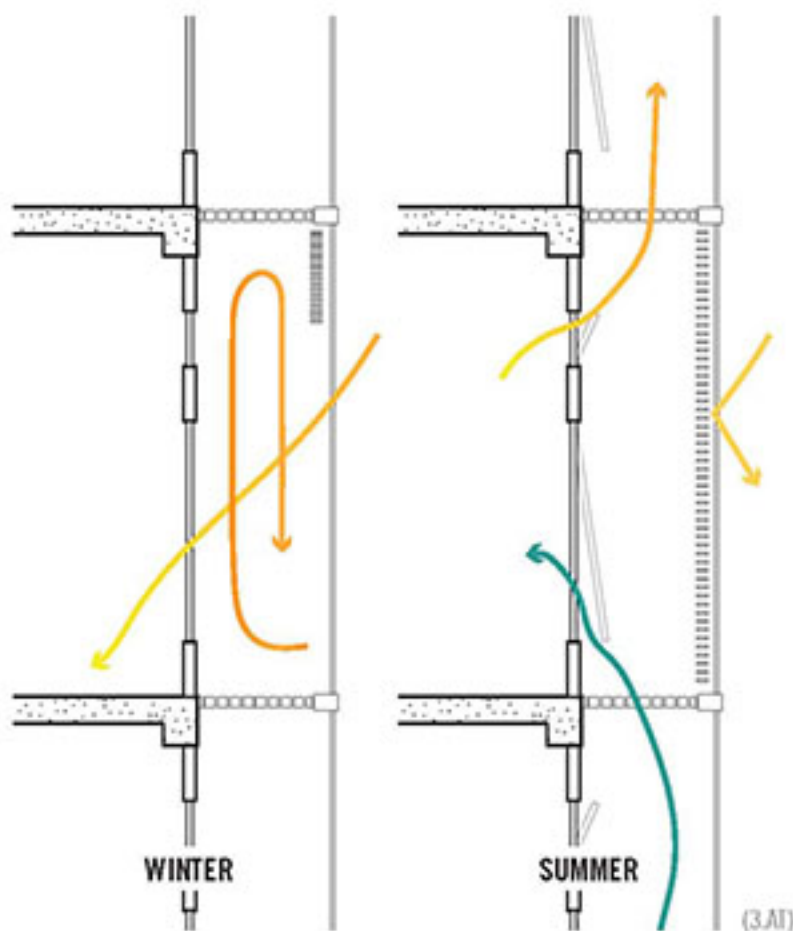
- Keep heat in and cold temperatures out during the winter
- Maximize southern light
- Use natural ventilation during summer months
- Protect from the summer sun

### DESIGN STRATEGIES

- Large southern openings
- Southern exposure preference
- Cross ventilation

### DESIGN OPPORTUNITIES

- Maximizing solar exposure and PV solar collection use the same formal gesture
- Lack of precipitation during the winter (rarely above 20cm) means snow load is not a major design concern



## TERRENCE DONNELLY CENTRE FOR CELLULAR AND BIMOLECULAR RESEARCH

TORONTO, ONTARIO / 2005 / architectsALLIANCE, BEHNISCH ARCHITEKTEN

This twelve-story institute located at the University of Toronto's St. George campus utilizes a double skin facade system as part of its incredibly energy efficient envelope system.

Along the south, the double skin facade works to heat during winter months and ventilate during summer months. During the winter, the air space between the two glazing skins is sealed. This creates an insulative barrier while allowing the sun's rays to heat both the air space and the research offices located directly beyond the double skin. During the summer, this air space is open, allowing the stack effect to draw cool air from near the ground, up between the double skin and ventilate the offices. Additionally, automated louvers block direct solar gains during heating degree days and reduce both cooling costs and the problem of glare (3.24).



ABOVE  
The old building meets the new twelve-story expansion with a bamboo forest.

LEFT  
The Double Skin system works well in cold climates because it has high thermal gains in the winter but during the summer, the air can be flushed with the stack effect. As the air between the glazing heats, it rises and pulls cool air from the ground through the building.

### SIGNIFICANCE

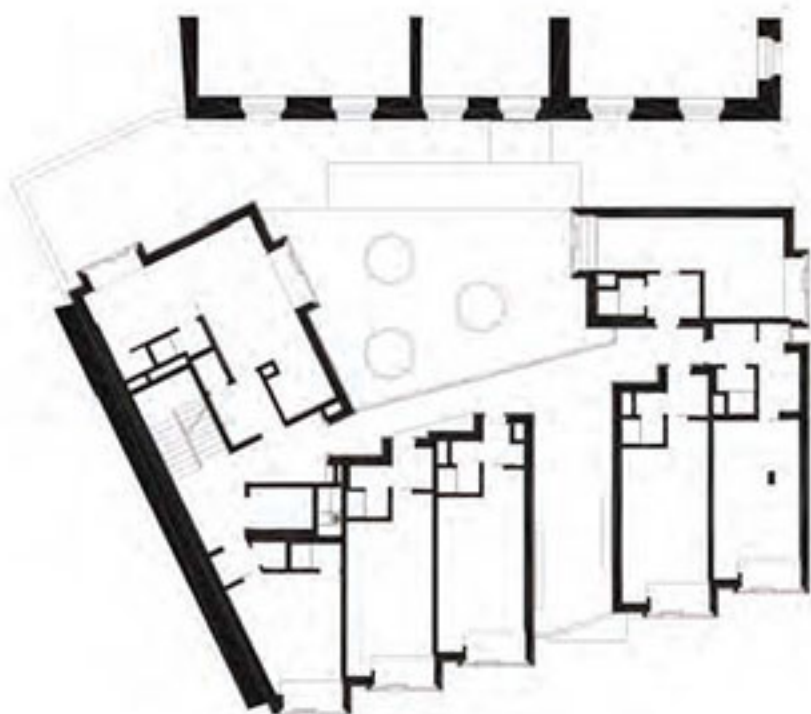
Though Prague's winters are not as brutal as Toronto's, both cities share a need for large solar gains in the winter time and a high humidity. Natural ventilation in these climates is a necessary design requirement. A double skin facade lets in a lot of light (great for the cloudy Prague winters) while remaining thermally and environmentally viable.

### OPPOSITE

Exterior view of double skin facade of the research center







(3.AK)

#### PLAN

The apartments are oriented south for maximum solar exposure.

A U-Shape building plan creates a courtyard against the building to the north. This shared courtyard space, broken to allow pedestrians between is common in Old Town Prague.

## TENEMENT HOUSE

### PRAGUE 1, PRAGUE / 2011 / DaM

- The building "takes advantage of passive solar design, glazing, ventilation and green materials to give it a high degree of energy efficiency."
- "Each compact apartment has at least two openings on either side to encourage views, daylighting and ventilation."
- "The project is oriented to the south and it takes advantage of the sun for heating in the winter. Meanwhile, window "boxes" on the ends help reduce solar heat gain in the summer."
- "The tight and energy-efficient envelope is made from glass fiber concrete panels on the outside, galvanized steel, molded glass blocks, and timber window frames." (<http://inhabitat.com/pragues-passive-solar-social-housing-project-makes-the-most-of-inexpensive-materials/>)
- "The flats are mostly of minimum size allowing lateral ventilation; due to their orientation to the south and generous glazing the flats enjoy plenty of natural light and sun." (3.25).

#### SIGNIFICANCE

Because this building is only a few hundred meters from our site, the housing complex is designed for the climate of Prague and proportions of a urban environment.



# WILL IT WORK?



## SMART GROWTH + SMART CODE

Smart Growth is a viable city planning guide. The best way to encourage the best aspects of Smart Growth is to encourage a dense development in Bubny to limit Prague's sprawl. Parts of Smart Code should be used on the site as part of the modules of development.



## NEW URBANISM

The urban structuring and place-making tactics centering around walkable communities championed by New Urbanism could help shape a sustainable urban fabric on the site. The case reviews show progressive applications of New Urbanism that could succeed in the context of contemporary Prague.



## LEED NEIGHBORHOOD DEVELOPMENT

LEED Neighborhood Development guidelines are a great way for a project to incorporate ideas that have been tested and proved to create enriched communities. For this project, to appeal solely to these criteria would be limiting, however, there are some great ideas that will be showcased in the final plan.



## LANDSCAPE URBANISM

Elements of Landscape Urbanism as far as temporality and phasing of green infrastructure could prove critically important to ensuring an ecologically successful design. Precedents and case studies prove the environmental, social, and economic benefits of designing with landscape features as the foundation for development.



## HEALTHY STREETS

"Healthy environments encourage healthy communities"

This strategy works on-site because it provides a comprehensive solution for pedestrian safety, transportation circulation, storm-water mitigation, and healthy spaces.







## BROWNFIELD REMEDIATION

“Various strategies for unique situations”

This approach offers several cost-effective solutions to the remediation of potentially contaminated soils on-site, while also informing land-form design.



## STORM-WATER RUNOFF MANAGEMENT

Storm-water management is something that has to be looked at on a large scale. This will help to create an urban environment that is more resilient, more prepared for heavy rain events, and provides linkage through a series of greenways and open space networks.



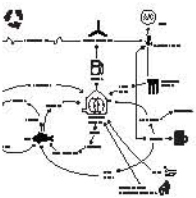
## LIVING MACHINES

Ecological waste water treatment is a progressive way to deal with our sewage. This is an element that will be seen on small scales throughout the plan. If every building could treat and deal with its own sewage on site, we could create more green space, conserve resources, and save money by not using traditional methods.



## URBAN FORESTRY

Urban Forestry is a great way to provide ecosystem services while also providing an urban respite for city dwellers.



## WASTE-TO-ENERGY

“Creating jobs and revenue while reducing the carbon footprint”

This concept may work on-site, but political wrangling may prove to be the biggest hurdle.



## DOUBLE-SKIN FACADE

Double skins are excellent in cold weather and especially in Prague's climate. Double skins are great for insulation without limiting daylighting strategies. Additionally, double skins do not limit the ability to naturally ventilate a mid-rise to high-rise building.

