## Graduation Plan: All tracks

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The graduation plan consists of at least the following data/segments:

<table>
<thead>
<tr>
<th><strong>Personal information</strong></th>
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<tbody>
<tr>
<td>Name</td>
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</tbody>
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<tr>
<th><strong>Studio</strong></th>
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<tbody>
<tr>
<td>Name / Theme</td>
<td>Design of Urban Fabrics</td>
</tr>
<tr>
<td>Teachers / tutors</td>
<td>First Mentor: Luisa Calabrese</td>
</tr>
<tr>
<td></td>
<td>Second Mentor: Steffen Nijhuis</td>
</tr>
</tbody>
</table>

| **Argumentation of choice of the studio** | First, the selection of Urban Fabrics is due to my practice in landscape architecture in bachelors. I would like to combine my passion and experience in the field of landscape design, with the newly achieved knowledge from the studies of urbanism in TUDelft. Urban Fabrics provides the best opportunity for me to implement my goal, as the studio largely focuses on urban landscape/open space and its relationship with urban environment.

Second, the selection of the studio relates to my interest in my home country. Taiwan, one of the earliest developed cities in Asia, is facing the issue of urban regeneration as its urban environment has already aged. The motivation is to see how to position new urban design projects under the context of regenerating Taiwanese urban environment: whether to construct the newer and more magnificent landmark projects to increase competitiveness, to ensure the identity of Taiwanese urban landscape, or even to return lands for public and social participation.

In general, I would like to examine and further invest my passion on spatial and human aspect of urbanism. Therefore, Design for Urban Fabrics would be the most suitable choice for the thesis topic. |
## Graduation project

| Title of the graduation project | URBAN STITCH Transportation Infrastructure Renewal Project as Opportunity of Urban Regeneration |

## Goal

<table>
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<tr>
<th>Location:</th>
<th>Taoyuan City, Taiwan</th>
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<tr>
<td>The posed problem, research questions and design assignment in which these result.</td>
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**BRIEF OF INTEREST:**

The thesis will look into the specific case of TRA Taoyuan Underground Railway Project. The goal of thesis is to design the evacuated corridor after the transition of existing railway to underground.

**RESEARCH QUESTION:**

How to mitigate and prevent social problems from the implementation of transportation infrastructure by the opportunity of enhancing TRA Taoyuan Underground Railway Project into an urban regeneration project?

**PROBLEM STATEMENT:**

As the conclusion from the problem field, in order to avoid the adverse effects from the implementation of transportation infrastructure and promote social sustainability, it is crucial to unfold and evaluate the cause and effect of how transportation infrastructure implementation could impact urban environment. To describe the definition of social sustainability, as John Elkington coined the term in 1994, Triple Bottom Line framework has encouraged to evaluate performances of the profit and loss in corporation through three aspects: environmental, economic, and social (2004). Furthermore, social sustainability is associated with key concepts of social equity and sustainability of community, and heavily dependent on social networks, community participation, sense of place, and community stability and security (Bramley et al, 2006; Glasson and Wood, 2009). The thesis project will therefore explore on how to integrate the mentioned criteria for social sustainability with transportation infrastructural renewal project, and further escalate those infrastructure renewal projects to an urban regeneration plan which considered broader factors within an urban environment besides technical and economic aspect.

**DESIGN OUTCOME:**

The urban regeneration approach to integrate TRA Taoyuan Project with social considerations is crucial in order not to repeat the mistakes that have been made in the past practices of Taiwanese urban planning. By the meaning of enhancing competitiveness via renewal of urban infrastructure, it should not only improve the economic and development potential, but also the livability of the city. Rogerson has
stated in his paper that quality of life is also an index of a city's competitiveness, as quality of life directly links to developmental aspects such as economic production and attractiveness of personal migration (1999). Therefore, it is hoped to return the previously infrastructure-occupied urban corridor back to the use of human activities and further enhance the wellbeing of the urban dwellers. Therefore, the TRA Taoyuan Project becomes an urban landscape infrastructure project to test the approach of integrating urban systems and further facilitating social and ecological interactions (Nijhuis, Jauslin, and van der Hoeven, 2015).

To reveal the complexity and diversity on how social components could induce certain spatial characteristics of urban environment, human scale would be the most appropriate scale to be studied. Therefore, the tool selected to analyze and propose solution on this complexity is through spatial design. To initiate the spatial design, segments will be selected from TRA Taoyuan Project as the test design sites. The segments are selected due to being most representative sites for the problems that have been concluded from the analysis. As the first step to design, the urban design strategy on individual segments will be proposed according to the framework created from the analysis. Paralleled from that, urban design interventions will be selected by being the most suitable solutions depending on the existing problem and challenge, as well the other spatial and social site conditions. The selection of interventions will therefore be equipped as design toolbox that could be transferred to the other segments that have similar site conditions.

Supported by the theory of urban acupuncture, localized and community interventions are favored when constrained budgets and offering a retreat to urban dwellers (Kaye, 2011). Furthermore, according to the work from Ruin Academy, an independent, interdisciplinary research center in Taiwan, urban acupuncture is aimed to produce small scale but socially catalytic interventions into a city's urban fabric (Harrison, 2013). As the ultimate goal, it is hoped to create synthesis in between these small urban acupuncture interventions, and form large, systematic strategy in order to alleviate the existing or potential urban problems from the conflict between inconsiderate infrastructure implementation and the society

REFERENCE:

### Process

**Method description**

Appendix I will demonstrate the methodology invented for the thesis research.

Different methods applied will be described with different stages of the research.

- **PROBLEM FIELD**

  **Chronological Studies:**
  As the interest of the thesis started with the formation of urban environment due to establishment of infrastructure, the causation of urban development should therefore be traced back to its historical background. Tools that have been applied in chronological studies include historical literature review on Taiwanese urban development and news media. The chronological studies also provide an explicit framework to organize all the gathered information into a storyline.

- **PROBLEM STATEMENT**

  **Theoretical Review:**
  In order to further organize the gathered information in the problem field, theory review must be done in order to condense into a core statement. Since the keyword of “social” has been recurring in the problem field, the selection of theory is therefore based on social related theories.

- **PROBLEM ANALYSIS**

  **Case Study:**
  As mentioned, the case study project of TRA Taoyuan Project is referred in order to examine the theory-based urban problems under spatial context and provide a framework to initiate the research scope in order to make the research more efficient and effective.

- **PROBLEM ANALYSIS: SOCIO-SPATIAL ANALYSIS**

  **City Characteristics/Image analysis:** City image analysis serves as the framework to initiate the analysis of socio-spatial context in the urban environment where TRA Taoyuan Project locates. The analysis of city characteristics and image is crucial in social studies of urban environment. Supported by the evidences in the respective chapter, characteristics and image of the city is manifestation of the urban development and perception from society. In order to derive the characteristics and images, news media review is the tool mainly used.

  **Scalar Studies:** Certain urban components could only be viewed in respective scales. So are urban problems. In the socio-spatial analysis, three scales of TRA Taoyuan Project has been studied: municipal scale to understand the overall urban structure and its deficiency; site scale to grasp the design challenge from the adjacent
neighborhood; and segment scale to set as starting points of utilizing design to understand and tackle the urban problems.

Layer Analysis by Mapping: Each urban components are extracted and mapped on separate layers to understand the tendencies of these components’ spatial distribution. By overlapping these layers, it provided the overall tendencies since the urban components are selected with its reasoning from regarding framework.

Conclusion Drawing: Conclusion drawing is the exercise used to conceptualize the outcome of the layer analysis. By simplifying the complicated overlapping image of all the urban component layers, the underlying concepts such as tendencies or structures are therefore made easier to comprehend.

Typo-morphological Analysis: Typo-morphological analysis provides clear indexing of spatial condition existing on the site. The analysis has been used in the layer analysis when different urban morphology become crucial components to be mapped. It is also used in the selection of test design segments to compare the different segments in terms of their representativeness to the urban problems.

- PROBLEM ANALYSIS: SOCIO-POLITICAL ANALYSIS

Criteria Selection: Criteria selection is set as the framework to initiate the research to more effective and efficient direction in the vast pool of theories regarding to related theories. Criteria selection in the socio-political analysis has been conducted by the important characteristics of TRA Taoyuan Project.

Theoretical Review: After meeting the criteria, selected theories are reviewed to understand the complexity of the socio-political vulnerabilities in the implementation of transportation infrastructure projects. Reviews are conducted via the tool of literature review and case studies.

Application of Theory: The understanding of theories are to be validated by application. In the thesis, application of theories are executed by projecting the theories onto the case study of TRA Taoyuan Project, and further predicting future scenario regarding to potential socio-political interferences.

- URBAN DESIGN AS RESEARCH OUTCOME

Case Studies: From case studies, design interventions with similar site conditions could be referred and transferred to the urban design of TRA Taoyuan Project.

Theoretical Review: Theoretical review is to examine if the design application is the valid response to address the analyzed urban problems.

Field Work: Field work forms actual understanding of the site condition. Spatially, documentation via photography, recording, and measuring gives a clearer understanding of the site in human scale and sense. Socially, observation or interview
provides direct feedback on how inhabitant of the site responds to the analyzed urban problem in reality.

Test Design: Test design is a recurring process to examine which design application would be the most effective to tackle the urban problem, the most suitable in responding spatial configuration, and the most feasible in actual implementation. Reflection: Reflection should be executed to review if any improvement could be done within the process of the thesis research.

Literature and general practical preference

In order to extract the crucial concepts and theories to support the thesis, theoretical papers and case projects will be studied through decomposing keywords in the main research question:

How to mitigate and prevent social problems from the implementation of transportation infrastructure by the opportunity of enhancing TRA Taoyuan Underground Railway Project into an urban regeneration project?

In the main research question, three crucial parts are extracted: “Mitigate social problems” will look into socio-spatial problems induced by implementation of transportation infrastructure systems; “Prevent social problems” will look into socio-political problems as vulnerabilities during project implementation; "enhancing......into an urban regeneration project” will look into integration of large infrastructure renewal project with social context of its located site.

- SOCIO-SPATIAL PROBLEMS INDUCED BY IMPLEMENTATION OF TRANSPORTATION INFRASTRUCTURE SYSTEM

"Today, communications and social and economic organisation shift into cyberspace in a logic of hypertext as people break free from the constraints of place, to work and make community in networks across regional and even global dimensions. The internal orderings of cities seem to have become irrelevant, and the city has responded apparently by scattering. The rural peace is shattered as urban people spread into the countryside, to be followed by the rest of the city including its most central components. A new amorphous city of fragments has invaded everywhere, creating sprawls of low intensity urbanisation served by ribbons of traffic-clogged infrastructure." (Read, 2009)

"Urban fragmentation is a spatial phenomenon that results from the act of breaking up, breaking off from, or disjointing the pre-existing form and structure of the city and systems of cities......The social, economic and spatial requirements of these new technologies demand a shift from Fordist to post-Fordist systems of economic organisation and regulation and the fragmentation and reconstruction of the increasingly dysfunctional spatial forms adjusted to the requirements of the previous ‘industrial society’. Post-industrial societies create ‘post-industrial cities’ with all the spatial characteristics and trends identified as urban fragmentation." (Burges, 2005)
Both quotes addressed the main concept of socio-spatial problems existing in different scales of TRA Taoyuan Project. First quote describes the general urban phenomenon of infrastructure induced urban sprawl, which corresponds to the urban problems concluded in the municipal scale. Second quote describes urban fragmentation, another urban phenomenon existing in post-industrial cities, which the phenomenon could also be found on the site of TRA Taoyuan Project under site scale. The exploration of addressed phenomenon regarding to different urban conditions will be continued on the third (segment) scale that have been introduced. on academic theories, understanding of current site situation via mappings, review of news media, and site work.

- SOCIO-POLITICAL PROBLEMS AS VULNERABILITIES DURING PROJECT IMPLEMENTATION

"Because of the notable impacts caused by the large urban projects on their surrounding environments, the announcement by public authorities for the implementation of such a project on a valuable area of the city is enough to unlock a struggle of supporting and opposing forces, which will influence the process of production of the project itself, as well as its final outcome." (Cuenya and Drewe, 2006)

According to Cuenya, large urban projects are vulnerable of socio-political interferences. Theories on how these conflicts impact on project production will be selected further examined in order to predict the production process of the TRA case project. The mention of "announcement by public authorities," "supporting and opposing forces," and "process of production," has also been corresponding to "change of political regime," "conflicts between actors," and "planning processes and financing," which have also been the criteria selected as the framework on the chapter of socio-political problem analysis.

- TRANSITION FROM LARGE INFRASTRUCTURE RENEWAL PROJECT INTO URBAN REGENERATION

"......No town or city is immune from either the external forces that dictate the need to adapt, or the internal pressures that are present within urban areas and which can precipitate growth or decline. Urban regeneration is an outcome of the interplay between these many sources of influence and, more importantly, it is also a response to the opportunities and challenges which are presented by urban degeneration in a particular place at a specific moment in time." (Roberts and Skyes, 2000)

The definition of urban regeneration elaborates its ability and necessity to solve urban issues with the consideration of the complexity of urban environment. The definition further facilitates the thesis' standpoint on elevating an infrastructure renewal project into urban regeneration opportunities that counteracts urban problems that were induced by previous faulted urban planning practices.
Supported with the case project studied below, it is therefore known that large scale infrastructure renewal projects have potential to be tackled with integrated approach with other aspects within urban environment, including environmental sustainability, economic development, and the focus of the thesis, social context to their located sites. These case projects will become powerful references in future stage of urban design and strategy making.

The Big Dig, Boston, United States

"Replacing the six-lane elevated highway with an eight-to-ten-lane underground expressway directly beneath the existing road, culminating at its northern limit in a 14-lane, two-bridge crossing of the Charles River. After the underground highway opened to traffic, the crumbling elevated was demolished and in its place is open space and eventually modest development......Along with improving mobility in downtown Boston, the Project reconnected neighborhoods severed by the old elevated highway, and improved the quality of life in the city beyond the limited confines of the new expressway." (Massachusetts Department of Transportation Highway Division, 2016)

The Fibercity, Tokyo, Japan

"The Fiber City recognizes that existing structure must not be destroyed recklessly but instead a way needs to be found to re-use them in practical ways......The GREEN WEB is one example, designed to instill new life and meaning into old Metropolitan Highway, a portion of which is currently being talked about in the context of removal." (Ohno Laboratory, The University of Tokyo, 2005)

Cheonggyechon, Seoul, Korea

"By demolishing an elevated freeway and uncovering a section of the historic Cheonggyechon Stream, the Cheonggyechon Restoration Project created both ecological and recreational opportunities along a 3.6-mile corridor in the center of Seoul. The project has proven catalytic, spurring economic growth and development in an area of Seoul that had languished over the last several decades."(Landscape Performance Series).

REFERENCE:


"FIBERCITY." FIBERCITY. Ohno Laboratory, the University of Tokyo, n.d. Web. 14 Nov. 2016.


SOCIAL RELEVANCE

The establishment of transportation infrastructure does not merely involve with flow of matters, technical aspects on construction, and opportunities it introduces to urban development. As concluded in problem analysis, tremendous adverse impacts have been brought to the society, which are proven in the evidence of several case studies introduced in this thesis. Socio-spatial wise, the inconsiderate transportation infrastructure planning practice decades ago has resulted several urban issues tightly related to the wellbeing of society, including functioning industrial activities taking over urban environment and urban fragmentation due to the physical presence of infrastructure. Socio-political wise, the implementation of transportation infrastructure projects have potential to induce serious social problems, for example, development-induced replacement and uneven distribution of benefit between powerful stakeholders and general public.

Looking from a broader scope, this thesis addresses the relationship between transportation infrastructure and social sustainability. In order to define social sustainability, the nine human needs developed by Chilean economist Manfred Max-Neef provided insight on a healthy society, which are subsistence, protection, affection, understanding, participation, leisure, creation, identity, and freedom (Hitchcock and Willard, 2009). By the research, it is understood that the implementation of transportation infrastructure in fact deeply involved with several needs mentioned: Subsistence as distribution of resource from the infrastructure system, protection as social security of every part of urban environment, participation as involvement of citizens during important urban decision making, leisure as quality and quantity of open spaces, identity as relatability of an infrastructural city, and freedom as equal of right with any involved actors in the infrastructure project. Therefore, the thesis on the research of transportation infrastructure with social context of a city definitely has a strong societal relevance to urban dwellers.

As the next step of the thesis, it is aimed to bring out urban design as solution to the addressed issue, which would also largely enhance the social sustainability in a transportation infrastructure project. By utilizing design as the comprehensive dissemination of the research, it is hoped to also bring up awareness of people in related urban issues.

SCIENTIFIC RELEVANCE:

Academic wise, the thesis will be operated as research by design to examine the relationship of how transportation infrastructure impacts urban environment. Mentioned in the segment scale analysis during Problem Analysis chapter, practice-based research aims to contribute to knowledge accumulation and archival by dissemination of research knowledge (Biggs and Buchler, 2008). Hope to be
accumulated in the vast study field of transportation infrastructure in urban environment, the research accumulates and archives the previous knowledge on transportation infrastructure-induced urban problems, and eventually carried out as dissemination by design process on a specific case study. Furthermore, in order to disseminate the outcome from practice-based research, the fundament criteria of research including questions and answers, knowledge, methods, and audiences, will be reinterpreted and represented with other criteria from particular interests of practitioners, including visual representation or other form to present the content, rhetoric, and even practitioner’s experience (Biggs and Buchler, 2008). It is hoped to provide a more relatable narrative for the general audiences by more explicit approach of representation and interpretation of practitioner’s experience, furthermore enhances the awareness of public.

Practice wise, this thesis also takes the approach of design by research to tackle the existing problems in the process of urban project implementation. The methodology formed in this thesis is hoped to provide a transferrable framework when tackling to similar urban issues. The renewal of transportation infrastructure has been a trend as technology is continuously improving. However, as a recurring concept in the thesis, the inconsiderable planning of transportation infrastructure has led to the emergence of several urban issues. Therefore, the process to understand existing issues via case studies and theory research should be implemented into the process of establishing transportation infrastructure in order to avoid recurring mistakes. It is hoped that the thesis could serve as a pilot project to the methodology on approaching similar projects.

REFERENCE:


**Time planning**

Please refer to Appendix II for the time planning chart.