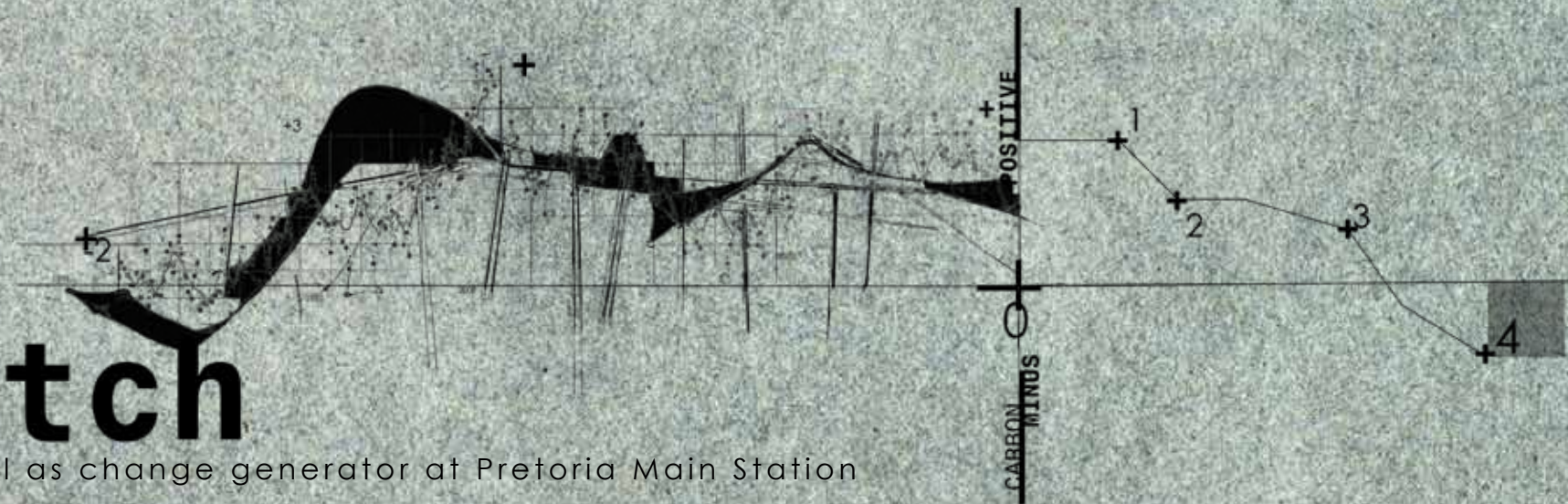




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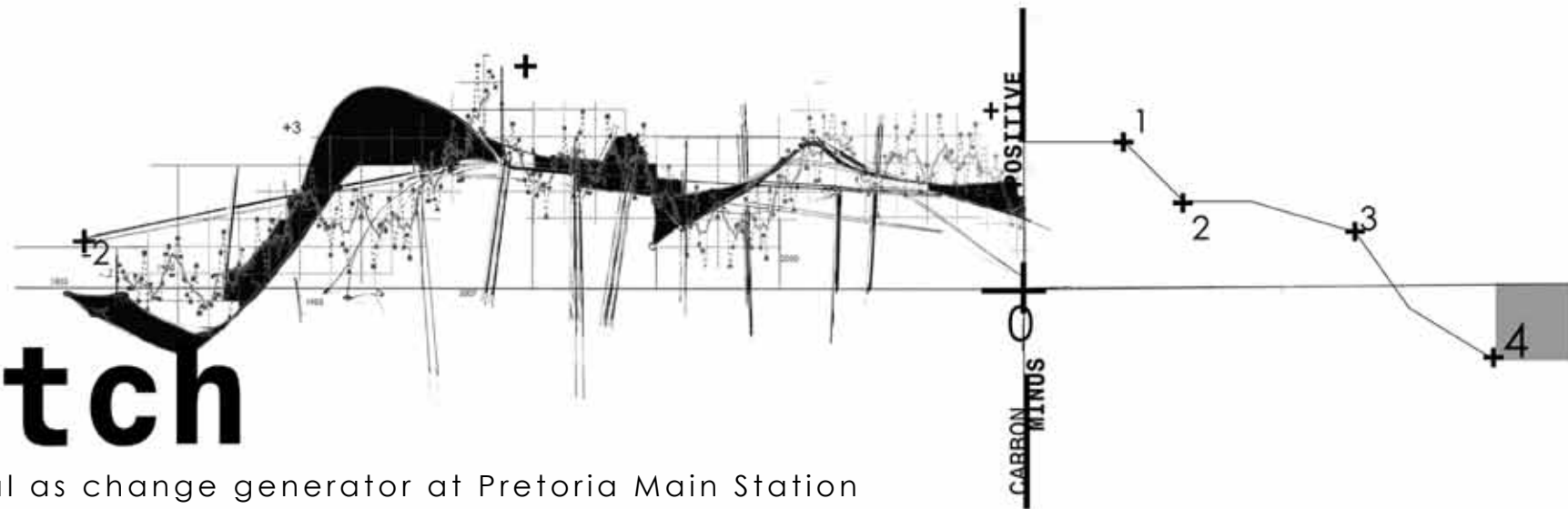
a BRT terminal as change generator at Pretoria Main Station

jm hugo 2010



switch

a BRT terminal as change generator at Pretoria Main Station





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STUDY FIELD: Environmental Potential

University of Pretoria
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Keywords

Transport, Bus Rapid Transport System, linking structure, low carbon, embodied energy, climate change.

The study responds to the increasing effect that climate change has on earth and society. In a global context of rapid urbanization and population growth the project aims to establish the role that architecture can play in the mitigation of climate change. **It addresses the embodied energy and carbon footprint of architecture in an urban context.**

The architectural building type that will be investigated is a transport interchange, specifically the BRT terminal at Pretoria Main Station and associated prototypical BRT stations. An architectural response that promotes public transport use will be investigated.

The proposed transport interchange will act as a seam to linking Salvokop with the city, while linking the whole of Tshwane.

The architectural intervention will use strategies to respond to predicted climate changes for Tshwane, and adopt strategies to mitigate it. Architectural technologies will be investigated to ensure that the structure has a low carbon footprint and low embodied energy.

Through energy conscious design strategies the energy use of the structure will be kept to a minimum.

The design will also address the social and historical context of the Pretoria Main Station, to ensure a coherent transport interchange that integrates all modes of transport.

The design will contribute to the historical character of the site with an ecosystemic layered approach, adding new functions and layers to the existing, to ensure its adaptability and sustainability.

This study forms the part of a departmental research study through the department of Architecture at Pretoria University - "Environmental potential" and the United Nations Development Programme [UNDP] and Global Environment Facility [GEF]. It aims to comply with the prerequisites for an M[Prof]Arch degree while achieving the goals and objectives set by the research study.



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This study is undertaken in partnership with the UNDP-GEF and the Environmental Potential Study Unit of the Department of Architecture, University of Pretoria.



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Low carbon Bus Rapid Transit Stations UNDP/GEF Student Grant Project Proposal

The Research Objectives

The first objective of this study is to design, with recognition of the GEF BRT Climate change requirements, a low carbon Bus Rapid Transit Station and auxiliary building/s. The chosen site is that of the existing Pretoria Main Station. This Station serves as an interchange for the BRT systems and act as an integral transportation hub for other modes of transport.

The second objective of the study is to design the low carbon BRT Station and auxiliary building/s in such a way that some of the modules can be used as a prototype and/or model for other such nodal and modal interchanges.

The third objective is to respect the cultural and historical setting of the Pretoria Main Station and hence be sensitive in responding to its context.

The fourth objective is that the study should incorporate aspects of LEED [or other green building rating systems]. It should include a design approach and normative position regarding the cradle-to-grave definition of materials and their production and a low

carbon footprint study. It must also address the embodied energy and life-cycle performance and management of these aspects within the architectural research and design resolution.

The fifth aim is that the student and the two study promoters attend a South African Green Building Council GreenStar course.

The anticipated approach to the research and methodology to be applied

The study will commence with a literature study and the gathering of data relevant to the design of a Climate Change sensitive low carbon BRT station and Auxiliary building/s.

After the literature study a design will commence. The design will be refined through an iterative process. The final design of the structures will be measured with a green building rating system. A set of developed detail technical drawings will be provided to support the design. The designed structures are academic investigations and will culminate in a mini dissertation and two publications to be submitted for peer reviewed publication in Architecture SA.



Met dank aan my Skepper.
Dankie Ilse, Arthur, Hennie, Talita, Danica en my ouers.



30-50% loss of global biodiversity [2100]¹

39% of world population exposed to rising sea levels²

50% less rain fed agriculture in Africa [2020]³

250 million exposed to water shortages in Eastern Africa [2020]⁴

150 million Environmental refugees [2050]⁵

60% increase in CO₂eq to 430 ppm [<1900 to 2006]⁶

Hottest years ever recorded
[1998, 2002, 2003, 2004, 2005]⁷

1.[Walker & King 2008:41] 2. [Roaf et al 2009:119] 3+4. [Ramos & Kahla 2009:262] 5. [Roaf et al 2009:135]
6.[Walker & King 2008:22] 7. [Roaf et al 2009:51]



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D E S I G N O F A

Intention:

LINKING STRUCTURE
CONNECTING [place/movement/people]
CLIMATE CHANGE SENSITIVE
LOW CARBON INTERVENTION

B R T T E R M I N A L

B U I L D I N G

Client:

CITY OF TSHWANE
UNDP/GEF [UP RESEARCH PROPOSAL]

Site:

PRETORIA MAIN STATION

Research field:

Environmental Potential

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