CAMPUS MASTER PLAN PRESENTATION
YUNNAN GARDEN CAMPUS

7 February 2011
Key point: Master Plan Document – the main planning guidance
Key point:
Background Papers
– various specialist information
Key point: Appendix – technical reports
Key point: Principal Ideas – a condensed version of the master plan
Contents

Foreword
Preface

1. Introduction
   1.1 Executive Summary
   1.2 Context
   1.3 Process
   1.4 Master Plan Goals

2. Master Plan – The Vision
   2.1 Establishing a Sense of Place: Introduction
   2.2 Guiding the Place: Key Principles
   2.3 Founding the Place: Natural Systems and Landscape
   2.4 Transforming the Campus: Built Form
   2.5 Lighting the Campus: Illumination
   2.6 Connecting the Campus: Traffic Infrastructure
   2.7 Servicing the Campus: In Ground Services
   2.8 Enacting the Place: Programs
   2.9 Developing the Place: Precincts
   2.10 Implementing the Place: The Future

3. Background Papers
   3.1 Phasing
   3.2 Costing
   3.3 Small Design Projects
   3.4 Landscape Plan
   3.5 Energy and Environmental Design
   3.6 Lighting
   3.7 Traffic Plan
   3.8 Campus Centre Parking
   3.9 Services Infrastructure
   3.10 Signage

4. Appendix
   4.1 Traffic Impact Assessment
   4.2 Tree Management Plan
Key point: *Heritage of traditional and contemporary buildings – sit comfortably together*
Key point: Early plan and topography
Key point: Picture of early days
Key point: Existing campus plan with CleanTech Park – with potential of seamless interrelationship
Master Plan Goals

- **Create** an enduring identity for the campus
- **Support** sustainability when designing infrastructure, buildings, and landscaped spaces
- **Develop** academic teaching facilities that support the pedagogy embraced by the Blue Ribbon Commission
- **Extend** the University’s engagement with the community
- **Create** an extended campus through seamless physical engagement with Clean Tech Park
- **Form** a heritage precinct of buildings, gardens, water bodies and landscapes
- **Locate and define** a new multifunction campus centre
- **Distribute** sporting and cultural facilities throughout the campus
- **Improve** pedestrian safety by upgrading the covered walkway system
- **Diversify** the residential character of the University through introducing new types of accommodation

*Key point: A comprehensive consultative process – resulted in identifiable goals*
Key point: Illustrative master plan
Key point: The Conceptual Design Framework of the Master Plan begins with Natural Systems
Guiding the Plan: **Key Principles**

- **Sustaining** the Natural Environment
- **Connecting** the Campus
- **Preserving** the Open Space
- **Infilling** the Built Environment
- **Reinforcing** the Urban Context

*Key point: Key Principles identify Design Directions*
Key point: Illustration
Key point: The Matrix / Patch / Corridor Planning Strategy – a basis of establishing an ecology supporting bio-diversity
Key point: Drains / Topography – as exist on the campus today (2010)
Key point: Concrete drains take water off campus / Not inviting
Key point: Transformation of Stormwater Management – could recreate aspects of the natural system
Key point: Uniting Chinese Heritage Centre and formal garden – as improvement to both / potential for underground building
Key point: Integrating Buildings and Landscape / green roofs
Key point: Endemic plants / supporting biodiversity
Key point: Attention to Built Form and Passive Design

Transforming the Campus: **Built Form**

Shading
Building Forms
Green Roofs
Underground Structures
Unifying Architecture
Material Selection
Retro-fitting Existing Buildings
Climate
Orientation
Siting
Views
Cross Ventilation
Thermal Comfort
Natural and Artificial Lighting
Key point: Examining existing buildings – as well as planning for new ones
Key point: North Spine potential
Key point: Modifications related to Small Groups / evolving pedagogy
Key point: Lighting the campus / Research 24/7
Key point: Example - Existing Condition
Key point: Night Glare
Key point: Potential to enhance the landscape and provide better lighting
Key point: **Entry Points** – could be individually illuminated for differing character
Key point: Water’s Edge – provide new safe campus environments
Key point: *Existing buildings – can continually be reassessed*
Key point: Identifying Precincts – as a means to establish difference
THE LINEAR CENTRE

A pedestrian link of many uses

Key point: New Central Area – can be a unifying element of the campus
Key point: Broad Zoning with Mixed Uses
Key point: Linear Centre / Connector / Entry
Key point: Welcoming Entry
Key point: Introduction of Shared Bicycle System
Key point: Bicycle Stations – proposed locations
Key point: Centralised Parking – for efficiency and encouragement to use shuttle system
Key point: Examples of Shuttles
Key point: Shuttle Routes
Key point: Primary Road System
Key point: Pedestrian Path 1
Key point: Shared Pedestrian and Bicycle Path 2
Key point: Shared Pedestrian and Bicycle Path 3
Key point: *Corridor provisions for Light Rail – connecting to Boon Lay MRT station*
Key point: Route interconnects CleanTech Park
Key point: Program and Activities / Artworks
Energy & Environmental Design

- **PROMOTE** energy efficiency in new buildings by, for example, endorsing the design of green roofs

- **RETRO-FIT** existing buildings to improve their energy efficiency

- **ENCOURAGE** the use of renewable energy sources wherever possible

- **REUSE & RECYCLE** water through rain water harvesting wherever possible

- **IMPLEMENT** environmental programs such as recycling and onsite composting

- **MINIMISE** waste generation on campus

- **DEVELOP POLICY** such as sustainable procuring & purchasing agreements

- **COMMUNICATE** environmental awareness on campus

- **SUPPORT** biodiversity through nurturing the campus’ natural environment

- **REDUCE** carbon intensive forms of energy consumption by, for example, establishing cycle paths and a fleet of low emission vehicles, to enhance public transport on campus

**Key point:** *Environmental Design – as an ever present experiment and exhibition*
Sustainability Opportunities

Yunnan Garden Campus is entering its next phase of development, and as the site evolves there is growing recognition of its unique park-like character deserves enhancement. Given the strong interest the University and its community has in matters environmental, the latter need not be passive participants but can contribute, not only in terms of feedback during the formulation of the Master Plan, but also through active participation by way of using the campus for research. Research programs can be constructed to investigate issues concerning water, energy and carbon emissions, waste, and biodiversity. Research outcomes can complement the development of the natural systems and built form on campus. Fortuitously, JTC Corporation’s CleanTech Park will be adjoining the University – a location allowing for unprecedented levels of collaboration between the two institutions. Collaborative site planning with CleanTech Park will help establish a larger and more sustainable ecosystem – especially in terms of wild fauna and flora diversity.

The University, CleanTech Park and industry groups will have further opportunity to both collaborate and apply their shared research and development in the wider community. In effect, Nanyang Technological University and CleanTech Park can and will become “test beds” at scales which are already practically real.

Given the nature of Nanyang Technological University and CleanTech Park, green building designs shall be the norm. The need for greater energy efficiency and reduction of carbon footprints will also give rise to research and development opportunities in power generation, alternative energy sources, cooling, lighting and transportation. The need to conserve water resources may lead to investigations in rainwater harvesting, wastewater separation and treatment coupled with resource recovery and wetlands for polishing water quality. The latter is interesting as it may allow extension into studies on biodiversity. Biological degradation to generate energy and composting of horticultural residues may be investigated, potentially combined with the food wastes arising from dining facilities on both the Nanyang Technological University and CleanTech Park campuses to enhance energy generation. Perhaps less obvious, there may also be the possibility for projects such as those which will utilize the substantial grounds for microbial carbon capture and so extend applications into rural areas and the hinterland of cities.

These are indeed exciting times as the NTU Master Plan is translated and implemented. Yunnan Garden Campus can itself become a vast laboratory allowing research on a scale which will be difficult to replicate elsewhere. There is every possibility these investigations will not only address the University’s and Singapore’s environmental issues but can also be applicable elsewhere in a world with rapidly growing urban centres and stressed rural areas. Given the rare confluence of sustained effort in matters environmental, capability, capacity in research and development, manpower and infrastructure (both within laboratories and considering the campus itself as a laboratory), there is every likelihood Nanyang Technological University will develop as a leader in sustainability education and research.

Contextually, the growth of urban centres across the world places increasing demands on resources, and the shift to alternative and renewable resources is inevitable. This shift is all the more important when viewed together with the need to mitigate climate change – the latter being a consequence of modes of resource utilization which strain Earth’s ecosystems. There is clearly a need to develop in a sustainable manner and reverse as much of the “damage” which has already been caused.

For Singapore, sustainable development means achieving both a more dynamic economy and a better quality living environment, for Singaporeans now and in the future.

IMGD, “Sustainable Singapore Blueprint”, April 2009

Notwithstanding the obvious direction towards addressing national needs, conscious sustainable development at a particular locale contributes to the global effort. Furthermore, Singapore is a high-density urban centre and its efforts and solutions are likely to find relevance in other urban centres around the world.

Alternative approaches leading to sustainable development require efforts in research and development, and an enlightened approach towards the assessment and adoption of new technologies. Singapore and Nanyang Technological University in particular, has been party to many of these initiatives. The University’s commitment to environmental science and engineering has been sustained for over two decades. The culmination of this sustained effort is the campus-wide “Sustainable Earth Peak of Excellence” in the NTU 2033 Strategic Plan. This includes within its overarching framework major interactive research entities such as the Research Centres of Excellence, the Earth Observatory of Singapore and the Singapore Centre for Environmental Life Sciences and Engineering. In addition to these are the Nanyang Environment and Water Research Institute and the Energy Research Institute at NTU. Together, they form a large number of ‘centres of competence’, recognized for their excellence in particular scientific and engineering niches.

As a leader of the Sustainability Task Force, Nanyang Technological University will be one of the ‘Guardians of Green’, committed to achieving the ‘Four Zero’s’:


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Key point: Precincts
Precinct 5: South Hill

Establishing a New Residential Community

South Hill precinct is situated on the south-east edge of Yunnan Garden Campus, adjacent to the Pan Island Parkway. The precinct topography rises to the south of Lien Ying Chow Drive, forming a hill which offers good views over Yunnan Gardens. A number of undergraduate residential halls, the predominant building type in the precinct, are situated on the lower slopes of South Hill, while the President's Lodge, staff bungalows and a small amount of faculty housing are located at the top. To the north-east of Lien Ying Chew Drive, the land falls to a narrow valley containing a small water body, before rising and levelling into a broad expanse of open space shared with the Sports Centre precinct beyond.

Collectively, these new residential buildings will form a distinctive backdrop to the Sports and Recreation  

precinct beyond. Their north-elevation will help to  

define the boundary of the open space above the  

landscaped roofs of the Sports Centre's underground  

buildings, and terminate the southern vista afforded  

by the new vehicular approach into campus further  

north. It is expected that individual houses established  

for the residential halls in this location will be  

inclusive of extra-aademic facilities, diversifying  

building use within the precinct and encouraging  

students, who may otherwise have no reason to  

frequent this part of campus, to spend time with their  

colleagues while engaging in the University's various  

social, cultural and academic programs.

The street entrance to South Hill precinct will require  

minor alteration as a consequence of the introduction  

of the new entry road into campus further north,  

through the removal of the road link currently  

connecting Nanyang Green and Lien Ying Chew  

Drive.
Key point: Illustrations / Guidelines
Key point: Building Sites / Illustrations of existing precinct context
Key point: Sketch of natural system and landscape
Key point: *The New Campus Centre*

**THE CAMPUS CENTRE**

Linking the Campus
Key point: Sketch showing views across campus centre terrace to the east
Key point: Night Time Destination
Key point: Major Elements utilizing the topography to advantage
Key point: **Walkway and Activities and mixed use facilities**
Key point: Explanatory Sections
Key point: Sketch
Key point: New campus welcoming entry
Key point: Overview