Best Practices in Sustainable Urban Planning
可持续城市规划的实践

- China Mayor's Sustainable Development Conference November 15-16, 2007

中国市长可持续发展会议
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中国，天津

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Best Practices in Sustainable Urban Planning – Overview
可持续城市规划的实践——综述

- 城市规划发展趋势及节能背景
- 最佳实践：可持续城市规划
- 城市建设项目中的最佳实践及未来前景

- Background of Urban Planning Movements and Energy Conservation
- Best Practices: Sustainable City Planning
- Best Practices and Future Prospects in Urban Sector Projects

Background – Urban Planning Movements and Energy Conservation
城市规划发展趋势及节能背景

Urban Planning Movements and Energy Conservation
城市规划发展趋势及节能

- 城市规划的发展描述了选择建筑方式及地点的方法
- 最佳实践为能源节约提供了解决方案。
- 然而……
- 城市规划和节能没有有效的整合

- Urban Planning Movements describe approaches to how and where we build
- The best practices also provide solutions for conserving energy
- But...
- Urban Planning and Energy Efficiency Movements have operated separately

Urban Planning Movements and Energy Conservation
美国及欧洲的城市规划发展趋势

- 新都市主义
- 精明增长
- 公共交通引导城市发展（TOD）
- 可步行的，混合功能的社区
- 对社区公共交通进行投资
- 减少对汽车的依赖

- New Urbanism
- Smart Growth
- Transit-Oriented Development (TOD)
- Walkable, mixed use communities
- Invest in community transit
- Reduce dependence on automobiles

Energy Use and Urban Planning
能源利用及城市规划

US Energy Use

- 38% - Industrial
- 29% - Transportation
- 19% - Residential
- 16% - Commercial

Higher Density
+
Mixed Land Uses
=
Lower per capita energy use and Lower vehicle miles

美国能源利用情况

- 38% - 工业
- 29% - 交通
- 19% - 住宅
- 16% - 商业

较高密度
+
土地（功能）混合开发利用
=
人均较低的能源消费以及较低的机动车行驶里程

Urban Planning Movements – Smart Growth Principles
城市规划发展趋势-精明增长原则

- **土地混合开发利用**
- **楼宇设计紧凑化**
- **不同的住宅类型**
- 良好的社区步行环境
- 地区独特感
- 社区参与决策
- 保护公共空间，农田，自然景观以及关键的环境区域
- **发展并增强现有社区功能**
- 交通选择多样性
- 长效、公正、高效益成本的决策

- Mix land uses
- Compact building design
- Range of housing choices
- Walkable neighborhoods
- Sense of place – uniqueness
- Community collaboration in decisions
- Preserve open space, farmland, natural beauty and critical environmental areas
- Develop in and strengthen existing communities
- Variety of transportation choices
- Predictable, fair, and cost-effective decision

Urban Planning Movements –Better Design
城市规划发展趋势 –优化设计

- Traditional
- 传统型
  - Requires cars between destinations and has no unique character
  - 目的地之间通车,无独特风格

- New
- 新型
  - Walkable, Accessible, Architecture with local context
  - 可步行,交通畅达, 建筑有当地的风格


Urban Planning Movements –Better Design
城市规划发展趋势 – 优化设计

- Traditional
- 传统型
  - Land used for roadways and parking lots
  - 土地用于公路和停车场

- New
- 新型
  - Land used for green spaces productive uses
  - 土地用于高效的创造绿色空间


Urban Planning Movements – Accessibility and Lifestyle
城市规划发展趋势 – 交通畅达及生活方式的改变

- Traditional
- 传统型
  - Single-use residential development, not unique, far from town
  - 单一功能的住宅发展, 无特色,远离市区

- New
- 新型
  - Higher density, walkable, unique design, accessible town center
  - 住宅密度高，可供步行，设计独特，到市中心交通畅达


Urban Planning Movements – Transit Oriented Development (TOD)
城市规划发展趋势 – 公交引导城市发展 (TOD)

- Transit station is prominent feature in town
- Mixed uses cluster near transit

- 公交站是市区的突出特色
- 公交站点附近混合使用集群建筑


Urban Planning Movements - TOD and Efficient Land Use
城市规划发展趋势 - 公共引导发展和土地有效利用

- Bulls-Eye Concept with Transit Node
- Pedestrian is highest priority – 10 minute walk circle

- 公交节点的牛眼理论
- 行人最大优先通行权-十分钟步行圈

Moving Urban Planning toward Sustainable City Planning
将传统规划转化为可持续的城市规划

- The Urban Planning Movements provide new, efficient alternatives to traditional development models

But…

- They do not address all aspects of energy conservation and are focused on local impacts

The next step…

- Sustainable City Planning - a broader approach to address multiple elements of planning and governance

- 城市规划发展的趋势是提供新的，高效的规划以替代传统的发展模式

但是…

- 他们没有考虑到能源问题的方方面面，而主要侧重对当地的影响

下一步…

- 可持续城市规划- 是解决规划和治理多种因素的更全面的方法

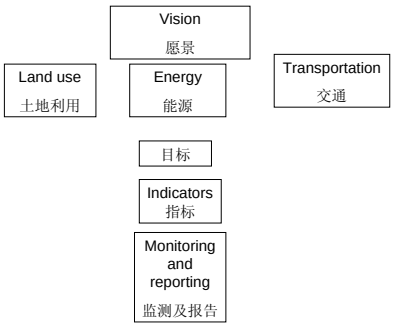
Best Practices:
Sustainable City Planning
最佳实践:
可持续城市规划

Sustainable City Planning
可持续城市规划

- 认识到所有的决策都会影响到我们为子孙后代创造可持续的社会，环境，和经济系统的能力
- 整合全市范围各部门及决策的可持续性
- 通过可持续规划及政策，推行城市区域及全球性影响的问责制

- Recognizes that all decisions affect our ability to sustain social, environmental and economic systems for future generations
- Integrates sustainability city-wide across all departments and decisions
- Promotes a city's accountability for its regional and global impacts through sustainability plans and policies

Sustainable City Plan Structure
可持续城市规划结构



Cities with Sustainability Plans
进行可持续性规划的城市

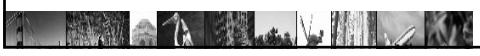
- 加利福尼州亚旧金山
- 加利福尼亚州圣莫尼卡
- 俄勒冈州波特兰
- 西雅图，华盛顿

- City of San Francisco, California
- City of Santa Monica, California
- City of Portland, Oregon
- City of Seattle, Washington

San Francisco Sustainable City – A Comprehensive Policy Framework
可持续城市-旧金山-全面政策框架

- 空气质量
- 生物多样化
- 能源，气候变化和臭氧消耗
- 粮食及农业
- 有害材料
- 经济发展
- 环境公正
- 风险管理
- 人类健康
- 公园，空地，街道设施
- 固体废弃物
- 交通运输
- 水和废水
- 市政支出
- 宣传教育

- Air Quality
- Biodiversity
- Energy, Climate Change and Ozone Depletion
- Food and Agriculture
- Hazardous Materials
- Economic Development
- Environmental Justice
- Risk Management
- Human Health
- Parks, Open Space, Streetscapes
- Solid Waste
- Transportation
- Water and Wastewater
- Municipal Expenditure
- Public Information and Education



San Francisco Successes
旧金山的成果

- $100 million solar bond issue
- Solar Access Zoning Codes
- Climate Action Plan
- Zero Waste Plan
- Plan to phase out fossil fuels
- Housing near employment and retail
- Legislation for Municipal Expenditures and Improvements for
  - Green Building
  - Non-toxic goods

- 发行1亿美元太阳能债券
- 太阳能使用标准
- 保护气候行动计划
- 零垃圾计划
- 逐步淘汰化石燃料的计划
- 房屋附近的就业及零售
- 制市政开支，用来改善
  - 绿色建筑
  - 无害化商品

Santa Monica Sustainability Plan - A Framework for Decision Making
圣莫尼卡市可持续规划-决策制定框架

Policy Areas

- Resource Conservation
- Environmental and Public Health
- Transportation
- Economic Development
- Open Space and Land Use
- Housing
- Community Education and Participation
- Human Dignity

政策范畴

- 资源节约
- 环境及公共健康
- 交通运输
- 经济发展
- 空地及土地利用
- 住宅
- 社区教育及参与
- 人的尊严

Santa Monica Successes
圣莫尼卡市的成果

- 美国第一个全部购买可再生能源来提供城市电力需求的城市。
- 80 %的城市机动车使用替代燃料
- 67 %的固体废物得以处理
- 城市的温室气体排放量保持在1990年1 %以内的水平
- 在美国所有城市中人均绿色建筑最大

- First city in US to purchase all renewable power for all municipal electricity needs
- 80% of the municipal fleet is powered with alternative fuels
- 67% of solid waste diverted
- City's Green House Gas Emissions are within 1% of 1990 levels
- Most Green Buildings per capita of any US city

Portland Office of Sustainability
波特兰可持续发展办公室

Principles

- Support a stable, diverse and equitable economy
- Protect the quality of the air, water, land and other natural resources
- Conserve native vegetation, fish, wildlife habitat and other ecosystems
- Minimize human impacts on local and worldwide ecosystems

Policy Areas

- Solid Waste & Recycling
- Climate change
- Green Building
- Endangered Species
- Natural Resource Protection
- Sustainable Food
- Sustainable Government

原则

- 支持稳定的，多元化的和公平的经济
- 保护空气，水，土地和其他自然资源的质量
- 保护天然植被，鱼类，野生动物栖息地和其他生态系统
- 尽量减少人类活动对当地和全世界生态系统的影响

政策范畴

- 固体废物及循环利用
- 气候变化
- 绿色建筑
- 濒危物种
- 自然资源保护
- 可持续的粮食
- 可持续的政府

Portland Successes – 1990-2005
波特兰的成果 – 1990-2005

- Adopted Local Action Plan on Global Warming
- 12.5% decrease in per capita emissions
- 75% growth in transit use
- 54% participation in recycling
- 11% municipal electricity from renewable resources
- Green Building & Eco Roof Policy
  - Mandatory for publicly funded projects
  - Expedited permitting for private development

- 通过了全球变暖地方行动计划
- 人均排放减少了12.5%
- 公交利用增长了75%
- 54% 的人参与回收利用
- 11%的城市用电来自可再生资源
- 绿色建筑 与生态屋顶政策
  - 强制公众资助项目
  - 加快允许私营发展

Seattle – Mayor's Sustainable Initiatives
西雅图 – 市长的可持续发展项目

- Mayor's Environmental Action Agenda 2002 – 4 pillars:
  - Climate Change Initiative
  - Restore our Waters Program
  - Green Seattle Initiative
  - Healthy People & Communities
- 2005 First Mayor in US to sign US Mayor's Climate Protection Agreement
- Adopted Seattle's Climate Action Plan 2006
  - $37 million proposal for voters in November 2007
- Urban Forest Management Plan 2007

- 市长的2002年环保行动纲领 – 4 个支柱:
  - 气候变化项目
  - 恢复我们的水域计划
  - 绿色西雅图倡议
  - 健康的人与社区
- 2005年，第一位签署美国市长气候保护协定的市长
- 实施了西雅图的2006气候行动计划
  - 2007年11月提出了3700万美元的可持续发展选民提案
- 2007年城市森林管理计划

Seattle Successes – 2002-2006
西雅图的成果 – 2002-2006

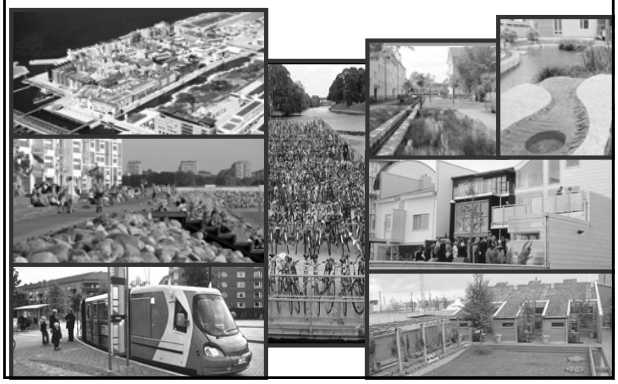
- Municipal Utility achieved zero net emissions of green house gases
- 12% reduction in fleet fossil fuels since 1999
- 4,000 new trees
- Ordinance adopted for Environmentally Critical Areas
- 市政公用事业达到了温室气体的零净排放
- 从1999年以来，机动车化石燃料使用减少了12%
- 新种4,000 棵树
- 为环境敏感地区制订了法令

Seattle Successes – 2002-2006
西雅图的成就 – 2002-2006

- Completed 7 public Green Building projects – plus green roof on City Hall
- Revised Downtown Zoning where new buildings now meet LEED standards and contribute to affordable housing and public amenities
- 完成7项公共绿色建设项目- 加上市政厅的绿色屋顶
- 整改市中心地带，使新建筑物现在能满足杰出节能环保绿色社区认证体系(LEED ND)标准， 并有助于建设经济适用型住房和公共娱乐设施

Best Practices and Future Trends in Urban Sector Projects
城市项目的最佳实践和未来发展趋势

Malmo, Sweden – Eco-city District – West Harbor
瑞典马尔默市 – 生态城区 – 西港区



Malmo, Sweden –Eco-city District – West Harbor
瑞典马尔默市 – 生态城区 – 西港区

A renewed connection with the sea honoring a shipbuilding heritage – Sweden's City of Tomorrow

再度与海洋,以及旧有的造船厂文化遗迹亲密接触，– 明天的瑞典城

Chicago - City-wide Urban Heat Island Mitigation
芝加哥-减缓城市的城市热岛效应

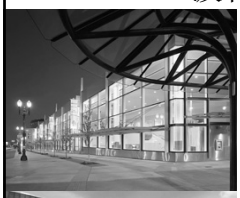
- 2001 年市政厅提出屋顶绿化计划
- 2006 年芝加哥的绿色屋顶已逾2000户
  - -屋顶绿化拨款
  - -景观条例
  - -能源法
  - -开放空间影响费
  - -停车场翻修
  - -绿化项目
- 2001 City Hall leads Green Roof Program
- 2006 Chicago has over 2000 green roofs
  - -Green Roof Grants
  - -Landscape Ordinance
  - -Energy Code
  - -Open space Impact Fee
  - -Parking Lot Resurfacing
  - -Greening Programs

1st Green Convention Center and the World's Largest Green Building – Pittsburgh, Pennsylvania
第1个绿色会议中心和世界上最大的绿色建筑-宾夕法尼亚州匹兹堡市

- 75% of exhibition spaces are naturally lit
- 60% of potable water use is reduced with a water reclamation system water
- 35% annual energy savings
- Facility provides recycling receptacles

- 75%的展览空间是自然照明
- 水回收系统节约了60 %的饮用水
- 每年可节省35%的能源
- 建筑设施提供循环回收容器

Portland Convention Center
波特兰会议中心



- $110,000 annual energy savings
- energy from local wind power
- Composts food waste
- Center operations require recycled materials for office products & publications
- Extensive rain gardens for water retention
- Transit-friendly destination

- 每年节约能源11万美元
- 14 %的能源来自当地的风力发电
- 堆肥食物渣滓
- 会议中心运营部门的办公用品和出版物采用再循环材料
- 开阔的积雨花园以便蓄水
- 公交运输可通达的目的

Future Prospects - LEED ND未来前景-杰出节能环保绿色社区认证体系(LEED ND)
International Design Standards for Community Design
社区设计的国际设计标准

- 理想的位置
  - 公交，住房，就业，居住和基础设施整合
- 街道格局与设计
  - 多样性，经济可负担，交通方便
- 建设与技术
  - 绿色，循环利用，减少热岛效应，太阳能建筑，用户端能源，废物管理
- 创新过程
  - 绩效和创新

- Smart Location
  - Proximities for transit, housing, employment, habitat and infrastructure
- Neighborhood Pattern & Design
  - Diversity, affordability, and access
- Construction & Technology
  - Green, reuse, heat island reduction, solar orientation, on-site energy, waste management
- Innovation Process
  - Performance and Creativity

LEED ND – 238 Pilot Projects
杰出节能环保绿色社区认证体系– 238个试点项目

- 工程范围从不到2英亩到12000余英亩
- 6个试点国家-美国，加拿大，墨西哥，中国，韩国，巴哈马
- 中国有5个项目
  - 重庆 –天地兴城
  - 北京-摩天城 (Silo City)
  - 北京 混合发展项目
  - 武汉– 混合应用

- Projects range from under 2 acres to over 12,000 acres
- 6 countries in pilot - US, Canada, Mexico, China, Korea, Bahamas
- 5 projects in China
  - Chongquin – Tiandi Xingcheng
  - Beijing – Silo City
  - Beijing – Linked Hybrid
  - Wuhan – Tiandi Mixed Use

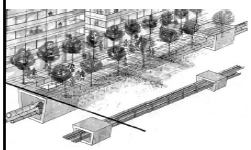
Toronto Waterfront Redevelopment – West Don Lands District LEED ND
多伦多市滨海开发区-西当区绿色建筑环保认证(LEED ND)

- Developing a sustainable community that reclaims the water's edge:
- Transformation through naturalization of the old ship channel, commemoration of the area's industrial character, transit and affordable housing

- 建设一个退地还水的可持续社区：
- 恢复旧航道的改造，保留该区域的工业特色

公共交通，和负担的起的住宅

Toronto Waterfront Redevelopment – West Don Lands District LEED ND
多伦多市滨海开发区-西当区绿色建筑环保认证(LEED ND)



- "District Energy Center" to Heat and Cool
  - Low-emissions central plant distributes hot and cold water through pipes
- "Transit First"
  - Transit lines to be in place to give new businesses and residents a choice from the start

- 供热供冷的"小区能源中心"
  - 低排放的中央设备通过管道输送冷热水
- "公交第一"
  - 一开始公交线路就要设计好，以便于新企业和居民使用

Toronto Waterfront Redevelopment – West Don Lands District LEED ND
多伦多市滨海开发区-西当区绿色建筑环保认证 (LEED ND)


Front Street Neighbourhood


Front Street Esplanade

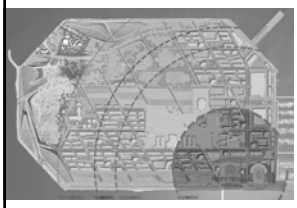

River Square Neighbourhood


Don River Park

San Francisco – Treasure Island LEED ND
旧金山-宝岛绿色建筑环保认证（LEED ND）

- Transforming a Naval Base and San Francisco island icon into a sustainable community
- 将海军基地和象征旧金山岛的地方改造成为可持续发展社区

San Francisco – Treasure Island LEED ND旧金山-宝岛绿色建筑环保认证（LEED ND）



- Transit Oriented
  - All homes within 15 min walk of transit hub and town center
  - Ferry Service
- Alternative Fuels for Fleet
  - Biofuels now
  - Design and funding for first fuel cell ferry in process
- 以公共交通为本
  - 各家各户可步行15分钟抵达交通枢纽和市中心
  - 渡轮服务
- 全部机动车都使用替代燃料
  - 目前使用生物燃料
  - 设计并资助了首个在建燃料电池渡轮

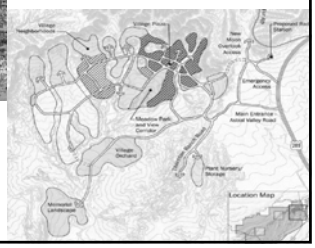
San Francisco – Treasure Island LEED ND
旧金山-宝岛绿色建筑环保认证（LEED ND）

- Solar and Wind Rows
- Photovoltaic and Solar Panels
- Wind Power
- Local District Power using Co-generative technology
- Reflective Roofs
- Use of Heat Rejection from Bay
  - 太阳能和风能设施
  - 光伏电和太阳能板
  - 风电
  - 使用热电联产技术的本地区电力
  - 反射式屋顶
  - 利用池式屋顶 使用从海湾排出的热量

LEED ND – Village at Galisteo Basin Preserve
绿色建筑环保认证–加里斯梯奥盆地村庄的保护

975 housing units, 300 are moderate income

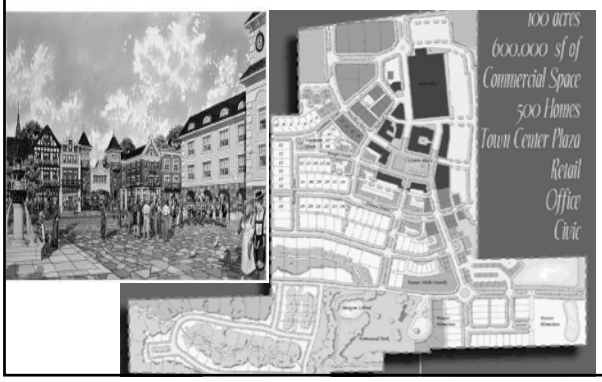
975个住户, 300户为中等收入水平



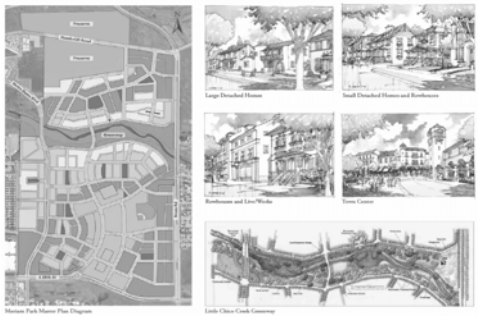
Aggressive water conservation and reclamation systems

大规模的节水和造地制度

LEED ND – North Clayton Village, Ohio
绿色建筑环保认证–俄亥俄州北克莱顿村



LEED ND – Meriam Park, Chico Califronia
绿色建筑环保认证– 加州奇科马瑞母公园

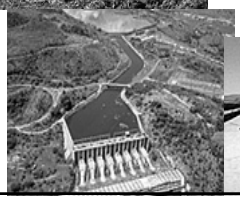


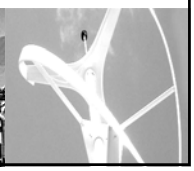
Emerging Trends –Integrating Science, Art, and Technology
新兴趋势–整合科学，艺术及技术

- 再生
- 热电联产
- 生物仿生
- Regeneration
- Cogeneration
- Biomimcry

Regeneration 再生

- 生物质
- 水电/潮汐力
- 太阳能
- 风 能
- Biomass
- Hydropower / Tidal Forces
- Solar
- Wind

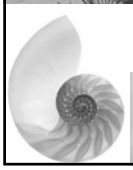
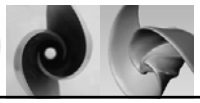




Co-generation - Simultaneous Heat and Power
热电联产–同时产热和发电

- The by-product of heat energy is harnessed, not wasted
- Energy Efficiency at least doubled in a facility – from 30% to 60-90%
- 热能的副产品得以利用，而不是浪费掉
- 一个机构的能源效率至少增加一倍，从30%至6 0–90%


Biomimicry–Nature's Efficiencies
生物仿生-自然的能力

- Tangled Fur- inspired fastening - Velcro
  Termite-inspired air conditioning – 90% savings
- Mollusk-inspired propeller design – over 50% reduction in torque and noise
- 受交错的毛皮启发而产生的扣件-维可牢尼龙搭扣
- 受白蚁启发而发明的空调-节省9 0%
- 受软体动物启发而形成的螺旋桨设计-减少多于5 0%的扭矩和噪音

Integration – The Eden Project, UK - Waste-neutral and Nearly Self-sufficient

整合–伊甸园项目，英国–都可用的废弃物–接近自给自足

- Biomes create tropical climate systems heated by bio-mass boilers
- Pine cone geometry for solar roof reduced depth and materials needed for circular roof support by over 50%
- 生物群落形成的热带气候系统是由生物质加热器加热的
- 应用于太阳能屋顶的松果几何形状为建造圆形屋顶减少了50%以上的用于支撑圆形屋顶所需要的材料