

Planning and Managing Sustainable Industrial Parks



Training Guidelines



United Nations
Industrial Development Organization

in cooperation with



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PREFACE

The purpose of this document is to provide training guidelines for planning and managing industrial parks in developing countries. The guidelines prepared by UNIDO and Michigan State University, aim at helping promoters of industrial parks in developing countries capitalise on the experience and know-how that has been accumulated in developed countries.

In compiling the training guidelines, we have drawn upon first-hand knowledge of best practices developed in United States, who have one of the longest experiences in industrial parks. Over the past decades, UNIDO has contributed to the diffusion of industrial parks in developing countries and these perspectives have been taken into account in the guidelines, as they relate to adapting the concept to suit environments especially relevant to developing countries.

UNIDO has developed experience in assisting the establishment and management of industrial parks & related facilities in developing economies of Africa, Arab Region, Asia, Central & Eastern Europe and Latin America.

Because of its international outreach and worldwide contacts, UNIDO has a comprehensive perspective and understanding of industrial needs of governments and industries in developed countries and in particular in developing countries. BRICS countries, which have now accumulated considerable experience on industrial parks, are also increasingly contributing to assist other Southern countries bilaterally and multilaterally, through UNIDO, in setting-up their facilities. In fact, also in this field, UNIDO has earned a reputation of neutral, honest broker between industrialized and industrializing countries and between industrializing countries themselves.

Since a few years the industrial park phenomenon is receiving increasing attention by African countries. Therefore UNIDO has been requested by several countries of the continent, such as Ethiopia,

Nigeria, Senegal, Zambia, among others, to provide assistance in the development of industrial parks to promote inclusive and sustainable industrial development in Africa.

The cooperation with Michigan State University is an on-going effort to identify and disseminate current best practices and to promote the exchange of ideas to encourage effective industrial park development.

The School of Planning, Design and Construction, the Center for Global Connections, and Michigan State University have a long history of applied research and practice that served as a strong foundation for this course and guidelines on planning and managing industrial parks.

Michigan State University (MSU) was established in 1855, and today is a leading research and educational institution, ranked 82nd in the global evaluation by Times Higher Education and ranking in the top 100 of the major global academic ranking systems. MSU serves over 50,000 students from 138 countries with more than 5,300 academic faculty and staff who teach over 200 degree programs. In 2015, MSU attracted external research funding of USD 528 million. MSU works to advance the common good in uncommon ways.

The School of Planning, Design and Construction has a broad and multidisciplinary research teaching and service focus around sustainability, land use, and the built environment through four programs: Construction Management, Interior Design, Landscape Architecture, and Urban and Regional Planning. Through its Land Policy Institute, the School is a leader in the application of planning theory to practice.

The Center for Global Connections aims to extend the wealth of knowledge and power of discovery embodied in Michigan State University to improve the lives and livelihoods of peoples throughout the developing world. The Center's programs include collaborative research with host country scientists; providing consultant services to international research organizations and foreign government agencies; and hosting faculty and researchers from host country institutions.



MODULE 1: OVERVIEW OF INDUSTRIAL PARKS

1. Introduction to Industrial Parks

Industrial parks offer space and services designed to attract and promote business and economic development. At their simplest, industrial parks provide cost-effective infrastructure, common facilities and services, allowing tenant businesses to benefit from economies of scale, by reducing investment and operational costs. Industrial parks can also provide a broader range of additional benefits, including promotion of innovation, agglomeration benefits, serving as an anchor for the surrounding community, education and training, as well as serving as entry points for new technology and practices. Besides serving a narrow interest in improved economic performance, sustainable industrial parks can operate as a platform to serve a wider range of economic, environmental and social interests. Most importantly, industrial parks are a means to an end: business attraction, greater productivity, employment opportunity, not an end in themselves. The focus should always be on what the park will do to make the economy and community better, not on the construction of a park alone or in isolation.

In the past many initiatives have failed by pursuing the strategy “build a park and the investments will come”. If a government is not able to develop added value support services, an industrial park will not move much a country from real estate investment to economic development.

1.1 Course Overview

This manual accompanies a course on the planning and management of industrial parks in the developing world. The course has many sections that each addresses one element of the development of industrial parks, from history, benefits, design, construction, management and evaluation. The manual includes exercises and additional reading designed to expand the lectures and written material associated with the training workshops.

The goals of the training cover a range of knowledge and skills associated with the

planning, design, management and evaluation of industrial parks. At the end of the course participants will be able to:

- 📍 Identify and argue the economic, social and environmental business case for industrial parks;
- 📍 Analyse the need for an Industrial Park;
- 📍 Facilitate meetings and information gathering to inform decision making;
- 📍 Work with planners and designers to create an Industrial Park;
- 📍 Implement Industrial Park strategies;
- 📍 Build linkages: network, collaboration, partnerships, between all stakeholders, and local communities;
- 📍 Develop a network of resources for successful implementation;
- 📍 Organize the management of operations;
- 📍 Evaluate the performance of the Industrial Park.

This course adopts a system approach by recognizing that industrial parks do not exist in a vacuum, but are physically anchored in a place and linked by infrastructure locally, nationally and globally.

Industrial parks need to be created as an integral part of the whole economic and social structure, developed in a sustainable integrated national support system.

In addition to physical connections, parks are also connected through flows of raw materials, inputs, finance and finished products. Successful industrial parks are sited within their economic and territorial context to achieve maximum synergy and gain agglomeration benefits, accruing to good industrial location decisions.

A holistic approach to industrial park planning and management is often inherent in the professions associated with their development. The decision making and planning process emphasizes analysis of all linkages associated with a park, and recognizing how to leverage assets to improve the business environment.

In particular, modules 4 and 5 of the course introduce a range of techniques that



incorporate holistic and systems thinking, including the ALERT model of technology planning, data driven decision management, the strategic planning process, SWOT analysis and the NCI Charrette system for engagement and decision making.

The course will arm participants with the techniques to understand the role of industrial parks in specific contexts and to use this information to plan and design current and future industrial parks.

1.2 Definition and history of Industrial Parks

According to UNIDO definition: “An industrial park can be defined as a tract of land developed and subdivided into plots according to a comprehensive plan with or without built-up factories, sometimes with common facilities for the use of a group of industries”¹.

Stated simply, an industrial park reserves space, plans and develops facilities, offers a range of services that enable tenant businesses to operate successfully. Parks can serve one or a related set of industries with the advantages of clustering, or offer space for a range of businesses that may not have economic ties or linkages.

The development of industrial parks aims at promoting interaction and synergies between firms, which is not often a spontaneous market phenomenon

Regardless of tenant characteristics, the park should allow higher productivity and efficiency and confer economies of scale and agglomeration. The industrial park should offer cost saving and/or economic benefits that encourage stronger economic activity than otherwise possible. One important function of an industrial park may be to provide incubation services to new businesses that benefit from the cost savings and information available to new businesses sharing resources.

Industrial parks are known by many names, including industrial estates, free and export processing zones, business and technology parks, enterprise or renaissance zones, etc. Despite the different terms, each applies to a policy or development that clusters economic activity as a way to enhance the economic performance of tenant businesses and to provide benefits to host communities.

While industry has a long history of agglomeration economy to benefit from access to raw materials, labour, transportation links, the intentional development of land for clustered industrial use emerged in the 1940s in Western Europe, and more specifically in UK, as cities and businesses sought ways to gain an economic advantage². One of the first references to industrial parks was presented in 1958 at a Conference on Community Building convened by the Urban Land Institute.

An industrial park is a planned or organized industrial district with a comprehensive plan designed to ensure compatibility between the industrial operations therein and the existing activities and character of the community in which the park is located. The industrial park must be of sufficient size and be suitably zoned to protect the areas surrounding it from being devoted to lower uses².

As the concept has evolved and been refined as a development policy, the core elements have remained, including: 1) clustering of businesses; 2) use of common resources and infrastructure; and 3) the management organization, as an entity committed to providing operations of the park. The need for parks grew in response to pressures in European and American cities for manufacturing space that did not conflict with needs for housing. Industrial parks became one approach to manage land use, preserve green space and separate industrial from residential uses.

A. Sharma emphasizes that nowadays one of the driving forces for sustainable industrial parks in the United States is recognition of the damage caused by pollution and the need to

¹ “Industrial estates: Principles and Practices”, UNIDO, 1997

² Sharma, Landscape of Industry: Transformation of (Eco) Industrial Park through history, 2013



manage the toxic by-products of industrial development. The industrial park has become both a policy for economic development as well as a means to manage environmental damage. At their best a sustainable industrial park can achieve both goals, although only an appropriate planning and management can greatly enhance the benefits. More recently in developing countries, industrial parks have proven a popular mechanism to serve as a catalyst for industrial and economic development by providing economies of scale and agglomeration to local and foreign firms.

1.3 Industrial Park typology

Industrial Parks can serve multiple focus areas, depending on the primary industrial activity. For example, a park focused on heavy industry usually caters to large scale manufacturing industries and some warehousing activities, but little to no office buildings.

An industrial park can be classified according to different characteristics:

According to the specialization of the park:

- 📍 Manufacturing park
- 📍 Science or Technology Park
- 📍 Research & Development Park
- 📍 Agro-Industrial Park
- 📍 Eco-Industrial Park
- 📍 Export Processing Zone/ Free Trade Zone

According to the type of ownership:

- 📍 Public
- 📍 Private
- 📍 Mixed (public-private partnership)

According to the type of land where it is established:

- 📍 Brown, established in vacant facilities of former large companies, also called “restructured, or reconstructed park”,
- 📍 Green, developed in a new area, specially aiming at environmental sustainability.

Some common categories are defined as follows:

Manufacturing Parks

The main function is manufacturing a product for distribution. These parks have basic building structures that offer large internal space configurations, adequate transportation networks and adequate basic utilities. They offer minimum design features and landscaping. They are sited in heavy industry zones and buffered from residential neighbourhoods.

Warehouse and Distribution Parks

Warehouse and distribution functions require large, low rise storage buildings with loading bays and easy circulation for truck traffic. They are most often sited close to major road networks and regional access points such as freight railways, cargo seaports and airports. Warehouse Parks are often termed as “jobless industrial parks” due to the low ratio of employees to space. Due to the limited number of employees, aesthetic conditions and amenities are minimal.

Science or Technology Parks

The International Association of Science Parks (IASP) provides an official definition of a science park, stressing the relevance of its contribution to the enhancement of innovation culture and companies’ upgrading and competitiveness through application of technology:

“A Science Park is an organization managed by specialized professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions. To enable these goals to be met, a science park stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities”³.

Tenant companies in science & technology parks focus on product and process innovation and technology

³ IASP International Board, 6 February, 2002



commercialization as opposed to manufacturing parks, which focus on more traditional industry and administration services.

Research and Development Parks

A Research and Development Park (R&D) park focuses on technology and science based industries. They are usually sited close to universities and research centres. Many offer incubator space for smaller innovating start-up companies. These parks are usually multifunctional with space for research, laboratories, offices, conference facilities, light manufacturing, and limited storage. An R&D park offers high paying jobs, showcases innovative products and entertains visitors and scientists from afar.

These parks need sophisticated technologies, state of the art infrastructure and utilities, well designed and equipped buildings and good landscaping. Due to the nature of the workforce and visitors, these parks offer additional amenities such as cafes, workout facilities, day-care and even a small hotel. R&D parks do not cater to much truck traffic and are less likely to need freight transportation networks. They are usually located in business and educational settings. This approach is more diffused in Japan to promote technology development in large industrial conglomerates, so called zaibatsu and keiretsu.

Mixed Use Business Parks

While industrial parks of the past were typically confined to industrial-related uses, related uses such as manufacturing support facilities, office and office support, and research related uses should be allowed in industrial parks.

There are instances where hotels and small retail activities can be sited in the industrial park. If they are desired, these uses should be placed on the periphery of the district or in places that enable traffic to easily flow without intermingling with the core activities of the district. Office uses, showrooms, and other ancillary or support functions such as conference and hotel facilities may be placed in the more visible areas of the park.

Telecom Parks or Smart Buildings

“Smart” buildings provide sophisticated telecommunications systems. Broadband and fibre optic infrastructure is not an amenity anymore, but an essential feature that is expected by most tenants. Bandwidth is as important as electricity in an office. Employees need to be able to communicate and exchange information.

Agro-Industrial Parks

These parks are popular where the agricultural sector plays an important role in the local or regional economy. Agro-industrial parks focus on the commercialization of agricultural produce.

Regional farms can bring their products to the park for all types of processing, storage, packaging, marketing, distribution and selling functions. Some parks may provide research and development services and educational activities. Areas to test new crops, fertilizers, and farming technologies may also be present. Agro Parks play a critical role for small and medium sized farming operations through economies of scale for many services and provide beneficial network of agriculture related businesses.

Eco-Industrial Parks

Eco-industrial parks are industrial parks in which tenants seek to minimize or eliminate waste generation, energy use, and other environmental impacts through symbiotic arrangements with other facilities in the park.

Lowe defines eco-industrial Park as⁴: (...) A community of manufacturing and service businesses seeking enhanced environmental and economic performance through collaboration in managing environmental and resource issues including energy, water, and materials. By working together, the community of businesses seeks a collective benefit that is greater than the sum of individual benefits each company would realize if it optimized its individual performance only." Because of the inter-relationships among the tenants, eco-

⁴ Lowe, "The Eco-Industrial Park: A Business Environment for a Sustainable Future", 1995



industrial parks often require a more sophisticated management and support system than a traditional industrial park. There are several eco-industrial parks in operation in the U.S., including Cape Charles, Virginia, and Londonderry, New Hampshire. Because of the reduced impacts of these facilities, they may be more compatible with non-industrial uses than conventional industrial parks.

Eco-industrial parks can be described as generally having the following characteristics:

- 💡 Energy: using existing energy sources efficiently, using waste energy from other facilities, and using renewable energy sources such as wind and solar energy;
- 💡 Material Reuse: waste generated by one facility becomes input material for other facilities in the park or marketed elsewhere. Water used by one facility may be re-used by another, with pre-treatment conducted as needed. Storm-water runoff can be captured and used for certain facility needs. All the facilities work to optimize use of all input materials and to minimize toxic materials use;
- 💡 Natural Systems: facility and park design that minimizes environmental impacts and reduces operating costs by using natural drainage systems, native plantings, and low-impact construction materials;
- 💡 Design and Construction: buildings and infrastructure are designed to be energy efficient, minimize pollution generation, and be durable, easily maintained, and flexible in their use. Established standards such as LEED and ISO14000 can be used to design and develop structures within industrial districts that are more sustainable in their construction and operation.

1.4 Featured Industrial Parks

The industrial park types described above may also incorporate elements associated with the tax status or business generation functions of the park. These functions can be applied to activities in some or all of the land devoted to the range of parks discussed above.

Free Trade Zones and Export Processing Zones

Free Trade Zones (FTZs) are a feature of many parks and have a long history, with the first cases created in Europe during the Middle Ages. Their basic functions were to attract foreign merchant ships and engage in transit trade. They served to import foreign goods and then re-export them to foreign countries without processing and to provide tariff exemptions for the cargo vessels. Their function was to collect and distribute goods, thus contributing to the economic development of the country or region adjacent to the Free Trade Zone.

Over the last 50 years, FTZs have changed from an emphasis on locating next to harbors and airports. FTZs have become export processing zones with three main features. First, they are specially designed for manufacturing, processing, and assembling commodities that are intended for export. Second, they provide a range of preferential treatment in importing, manufacturing, and exporting, such as the reduction of tariffs and other operating conveniences. Third, they are viewed as an opportunity to develop the manufacturing sector, increase employment, promote technological progress, and upgrade management levels. Overall, the purpose of export processing zones has been to promote production by means of foreign trade, so the tax reductions and exemptions are mainly limited to the processing of raw materials for import and export and are not for all goods. This is an important difference between export processing zones and free ports.

The United States of America has made some improvements to the concept of FTZs and export processing zone. First, any public or non-profit company can apply for the establishment of a foreign trade zone as long as there are customs authorities located within less than a 90-minute ride. Another advantage is flexibility. Both the general-purpose zone and the subzone have a complete entry and exit mechanism which means that they can temporarily "sleep" , namely cease operations, until they are "deactivated", completely abolished. They can also be "reactivated", thus resume operations,



within a certain period, thus eliminating "idle" foreign trade zones.

There are a number of strengths and weaknesses to using the FTZ concept. Strengths include:

- 📍 Lowering the costs of production and transaction;
- 📍 Promoting the international flow of production factors and the efficient allocation of global resources;
- 📍 Increasing consumer welfare;
- 📍 Promoting multilateral trade agreements;
- 📍 Increasing regional employment;
- 📍 Increasing the diversity of regional economy;

Because FTZs reflect economic liberalization, there are a number of weaknesses associated with this concept. They include:

- 📍 Increased dependence on cheaper imported goods that negatively affects domestic industries and causes overconsumption;
- 📍 Increased financial liberalization that causes the flight of capital to offshore tax-heavens;
- 📍 Competition between FTZs;
- 📍 Potential conflict with urban development policy by concentrating growth in one area of a city, region or country.

One solution to these issues would be to adopt a strategy that would implement different development strategies in different FTZs and reduce the competition among FTZs within one country that results from each one having almost the same preferential tax policies

Business Incubators

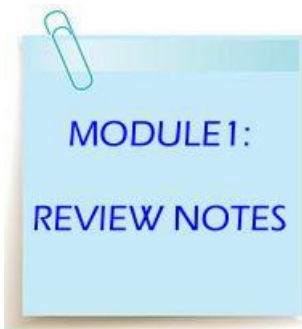
A common element in local economic development is the incubator, which is a facility that nurtures and develops start-up firms in the expectation that some will continue to grow and bring growth to the area. Since the 1990s there has been strong growth supported by information technology

and e-commerce firms that emerged from small start-ups. Firms like Google, Amazon, and Expedia all started as small businesses, so many areas seek to gain growth by encouraging new firms. Incubators have served as vehicles for standardizing new technology and work with universities and research and development organizations to commercialize the results of basic research. Later in this course we will focus on the potential to capture the benefits of R&D and new technology through university incubators and innovation centres.

Incubators have also served small business in traditional industries that seek organizational and financial support. Specialized and craft producers have often been supported by incubators that provide low cost shared services and space. An incubator might also be included in an industrial park devoted to nurturing new businesses. This function requires greater investment in services and expertise to assist new firms, and needs flexible spaces to accommodate different needs. Incubators often have limits on the time a business can use the facility, usually from 1 to 3 years, before moving on and relocate in allotted sheds/space of the industrial park.

1.5 Readings & Review

- 1) UNIDO, 1997
Industrial Estates: Principles and Practice
https://www.unido.org/uploads/tx_temp/avoila/Industrial_estates_principles_and_practice.pdf
- 2) Sharma, A., 2013
"Landscape of Industry: Transformation of (Eco) Industrial Park through History"
Journal of Arts and Humanities
<http://www.theartsjournal.org/index.php/site/article/view/216>,
- 3) UNDP, 2014 "Comparative Study of SEZs in Africa and China"
<http://www.cn.undp.org/content/dam/cn/hina/docs/Publications/UNDP-CH-Comparative%20Study%20on%20SEZs%20in%20Africa%20and%20China%20-%20ENG.pdf>



- a. Were you already familiar with the concept of industrial park and its different typologies? Has the module helped clarify the concept? What issue is not yet clear?

- b. Have you already visited an Industrial Park? Which one/s?

- c. Following this module, do you assess the park modality suitable to the demand requirements of private sector, as well as financial and technical capacities, of your country location?

- d. What typology of park do you assess most suitable to the needs of your country location (export, technology, eco-industry, start-ups, mixed-use)?



MODULE 2: COSTS & BENEFITS OF ESTABLISHING AN INDUSTRIAL PARK

2. Developing Industrial Parks

The process of planning and establishing an industrial park requires clear goals and objectives, and a strategy to link the park to broader goals of the host community. This module will discuss the rationale as well as common features expected in industrial parks along with the economic, social and environmental costs and benefits of related to the establishment of these facilities.

2.1 Objectives of Industrial Parks

Planners of industrial parks have a range of objectives or goals that the facility is designed to meet. Goals can be narrow, such as the creation of a location offering basic services for business, to a broader set of objectives including:

- Establishing manufacturing in regions and countries where the economy is heavily dependent on agriculture or extractive sectors. The mind-set, linkages, and knowledge base for manufacturing needs to be established in many areas, where there may be limited expertise and experience around an economic activity, are fundamental to sustained growth. Industrial parks can become examples and resources of an industrial organization and process aiming to support tenants and also inform entrepreneurs and business owners;
- Incubating new businesses or industries, and creating or reinforcing a sustained enterprise culture for the city and region, where the park is located. Small businesses often face problems when starting up, so parks that offer shared services can reduce costs, while facilitating access to information and business advice, can improve the probability of success for a new business;
- Community development: narrowly defined, an industrial park serves the needs of tenant businesses and workers, but a broader context is useful when planning and evaluating investments in such parks. The park can serve as a platform for broader goals, such as the

development of human capital and the provision of education and training. Parks can also offer a central location for service delivery to the surrounding community, such as a transportation hub, health care, mail and communication services, and branches of government agencies;

- Attract capital and foreign direct investment to a location because of the capacity of tenant businesses, as well as the reassurance an efficient industrial park offers to support businesses and for future industrial development;
- Environmental awareness and practices can be developed efficiently for many firms rather than one, as well as the costs and benefits of introducing green practices can be spread across many firms. Industrial parks that innovate in their practices can also serve as demonstration or pilot projects, with new ideas developed and refined for use elsewhere;
- Contributing to regional and national development is often a primary driver of industrial park establishment and management. The park helps establish new industries, and allows firms to grow, which provides investment and employment for the region. Parks can also address resource bottlenecks and promote import replacement for inputs to further encourage growth.

2.2 Context for Industrial Parks

Industrial parks do not function in isolation, but are part of the broader social, economic and political context of their location. The location, design and planning of an industrial park needs to take into account the communities and regions they serve, to maximize the likelihood of success and the benefits of production and employment. Some of the context elements that need to be considered include:

- Location in relation to the local, regional, national and international economies. Parks need to fit into the geographic layers of the economy by understanding the flows of investment, production, and employment. Location decisions need to incorporate many factors that range from what a location currently offers, plus how



the location can be developed in concert with surrounding communities and regions. The strongest caveat in placing industrial parks is the realization that building a park will not guarantee its success. An industrial park must be located to link to existing and planned industrial infrastructure, because a disconnected park will face far more challenges than one that recognizes and uses location based resources;

- 💡 Supply chains and logistics: the park needs to be aware of the supply chains of inputs used by tenant businesses, the sources of inputs, as well as the destination of outputs, at local, regional, national and international levels. A related factor is the cost and efficiency of transportation. While an isolated park may serve as a catalyst for transport investment and service, park tenant businesses must be able to move materials and information they need to operate with. For this reason, industrial parks often reinforce existing logistics hubs or are built in concert with new infrastructure logistics and transportation investments such as ports, airports, highways etc.;
- 💡 Community linkages will serve the industrial park and also benefit from its operations. Some of the linkages that need to be considered for a park include:
 - Labour, as the workers in an industrial park will need proximity and/or transportation to reach their employers. The park's workforce should live nearby, as parks can be a powerful force building and maintaining the communities around them. Workers with shorter commuting times need less compensation as they face lower time and transport costs;
 - Education and training can be provided or facilitated as a way to serve the needs of the park, and at the same time build human capital of the host community;
 - Policy goals can serve the local community by engaging marginalized populations, providing services such as health and education, and supporting new businesses.

💡 Environmental quality may be affected by the activities of an industrial park so location and operations need to be sensitive to environmental conditions, and how park operations will affect the surrounding communities. Park planners need to be familiar with site and regional topography, climate, groundwater and geology in order to manage the environmental impact of the project. Industrial parks can cause environmental and health damage through their operations, which eco-industrial parks seek to avoid through their design;

💡 Policy can be served using parks as an instrument to advance regional and national goals. Industrial parks can be used for many functions, such as anchoring urban/community development, promoting decentralization from congested areas, enhancing industrial capacity or establishing manufacturing standards. The challenge of industrial parks as a policy instrument is that the target is consistent with the park's capacity to deliver. Expectations about what parks can achieve can be overestimated or unreasonable, leading to a park being expected to achieve far more than is realistic.

The industrial park must represent one step in a series of industrial policy measures and the risk should be avoided to create an artificial support system in a vacuum

2.3 Provision of Business/Tenant Services

One of the advantages of industrial parks is their ability to provide a full range of infrastructure and services to tenant businesses. Some of the major elements of a park are detailed below:

💡 Road/Transport Infrastructure

Transportation serves many purposes including delivery of inputs and final products, and serves the needs of workers



through access to public transport, shared ride or alternate forms of transport able to meet the needs of employees in the park. Among the elements to assess for the establishment of a park are the condition of streets and access points, access to parking, loading and staging space, as well as internal way finding and signage. External factors include the connections between the industrial park and its community and markets, which can range from surrounding street conditions and public transport, to freight systems, including ports and airports. For all these systems, the costs of transportation, including congestion costs, influence the efficiency and competitiveness of the park as an industrial location;

Telecommunications

Telecommunications, such as telephone and internet, are important services for coordinating and marketing production and movement of materials, products and information. Access to telecommunications services may depend on the use of external providers, or actions by park managers to gain physical or cellular services for phones and internet. While most locations can now have mobile phone and internet access, the cost and reliability of services can vary considerably;

Energy

Energy, namely electricity and gas, is an essential element in an industrial park, yet electricity/gas services may be unreliable and/or costly in many areas. Parks able to offer consistent services provide an advantage to firms, as they would not need to have back-up sources, nor suffer lost work time due to energy losses. Energy provision by industrial parks may also adopt new technologies and focus on developing expertise around renewable sources rather than imported or non-renewable generation;

Water

Water is essential for park companies, workers as well as in many processes. Parks need to guarantee the provision of sufficient water appropriate for use by industrial processes for cleaning, by park workers, and for landscape management. Water supplies may need to be obtained, processed, delivered and charged to users by the park. In cases of unreliable supplies or poor quality,

a park may need to undertake its own water provision that may include wells, catchment or desalination;

Waste management

Waste management includes the removal of liquid and solid wastes that may contain toxic or environmental hazards. This would require the development of infrastructure for sewers, as well as processes for handling different forms and conditions of waste. The park may be able to implement recycling procedures to reduce waste flows that can decrease the impact on area treatment and landfill resources;

Public safety

Public safety includes many factors comprising security, fire protection and health/safety services. To meet these needs a park may need facilities from house police and fire services to the provision of specialized security services to tenants' services that can range from park guards, ID management, access control, and surveillance. Health and first aid services can be provided depending on the scale and needs of the park, while siting and planning can take into account access to nearby hospitals and health services;

Park/Tenant Services

Industrial parks can offer a wide range of services to benefit tenants and improve the competitiveness of the location. Some of the actions that a park can undertake include:

- Planning and management services allow tenants to focus on core business operations leaving infrastructure, service and planning functions to a centralized coordinating body. As a major consumer of services, such as utilities and transportation, the park should be able to obtain preferential rates and faster responses to problems than individual consumers;
- Selection/attraction of complementary businesses that serve to build economies of agglomeration and scale for the park. This is especially important for eco-industrial parks seeking symbiotic links between firms and functions;
- High quality space, which is made available on a flexible and affordable basis. The offer of space must be



diversified in terms of size and having a sector or activity focus, if required by park specialization. Once the space offer is not sufficient, additional efforts should be deployed to foster the development of new sheds, either equipping proximate lands or investing in a new park;

- Access to shared business services can be valuable for smaller firms that do not have the scale of work that allows the hiring of their own staff to manage functions from secretarial, human resources, accounting and payroll, maintenance, security, training, or promotion;
- Workforce development can include pre-selection of job candidates and credential verification to active engagement with schools and training facilities to connect park needs to education;
- Services that can promote the start-up and incubation of new and small businesses;
- Assistance with export promotion, including facilitating tenants with regulations, customs procedures, currency controls, and cultural awareness of external markets, as well as facilitating access to tax and export benefits;
- Promotion of the industrial park and tenant businesses through branding, marketing and establishing standards.

2.4 Benefits of Industrial Parks

Industrial parks seek to drive local development through the creation of space that promotes greater efficiency, lower costs and more competitive placement of businesses, while contributing to local community and economic development.

The benefits of an industrial park include the provision of industrial facilities, with access to reliable utilities and services. The park can offer economies of scale and agglomeration economies to tenant businesses.

By providing employment, education and training, the park serves local community needs, while the government can gain tax revenues, through business and higher wages. The park can serve broader interests

through environmental awareness and practices, and serve as a demonstration of processes and practices that can be adopted elsewhere.

Additional benefits can include the attraction of foreign and local investments, attraction of aid or assistance from government and international donors, spin-off businesses, and technology transfer.

Economic Benefits

Industrial parks offer many benefits to their host communities and countries, concerning the economic, social, environmental and public policy spheres, such as:

- Business creation and expansion through improved production conditions, more efficient infrastructure, access to capital, access to labour, and through services and information provided by the industrial park;
- Shared facilities include office space, reception staff, laboratory, language skills, banking and legal services, communications equipment, marketing and promotion, reduced regulatory costs, if central approval is awarded to the park, shared user/licensing fees managed by the park and not paid in full by individual businesses;
- Synergies with local and national planning efforts and investments for infrastructure, transportation, energy, water and waste;
- Industrial parks can serve as a portal to link local and international business ideas and opportunities, so that parks can serve as showcases of new technology, processes and standards for a country. Parks can be vehicles for technology transfer and development;
- Attraction of foreign direct investments, due to high standard facilities, human resource policies, training facilities, the development of the relevant supply chain activities and marketing efforts of industrial park management, all assets that can be joined in the same industrial park;
- Employment creation that can be also associated with education, human capital



development and career paths for workers in the industrial park;

- Economies of scale in production, services and materials provision, in management and in shared facilities;
- Agglomeration economies gained through the clustering of similar or related industries. Industrial parks that are developed in association with cluster projects will also have a more service driven approach by providing a variety of building accommodations to host SMEs and start-up companies, and a resource centre for industrial test or development platforms, as well as to animate the cluster organization. This applies to both new high tech clusters and upgrading of more traditional industrial sectors ;
- Indirect economic benefits can include: a) reduced demand for public social services due to higher and more stable incomes; b) removal of industrial functions from older residential areas; and c) new facilities that cut net pollution.

Social Benefits

While the focus of industrial park development is often on business and economic development, there are also many social benefits that accrue to host communities, such as:

- Improved access to employment and more consistent employment that provides higher and more stable living standards for workers and their families;
- Businesses can benefit from ethical practices endorsed and supported by industrial parks that serve worker interests, and also assure international investors that employment conditions meet basic human rights standards;
- Industrial parks can provide support for local entrepreneurs, and focus on the needs of women and underrepresented groups seeking business opportunities;
- Establish and enforce standards for working conditions that improve employee health and reduce on-the-job accidents;
- Linking education to employment needs to improve work opportunities for the local population. This can be achieved through schools and libraries that are part of the industrial park, or through apprenticeship and co-op programs that link students to work practices and experience;
- Industrial parks can include community services around health and welfare in their design, directly benefiting nearby residents. Parks can offer a central location for medical services, clinics, services for children etc.;
- Tax revenues from industrial parks can serve host communities by providing resources and services that might not be otherwise possible.

Environmental Benefits

Industrial parks can offer strong incentives along with facilities that promote a cleaner environment and better practices that benefit the environment. Some of the benefits include:

- The establishment and enforcement of environmental standards for all park tenants, and the provision of pollution monitoring data, so that the park has accurate information about its environmental impact;
- Easier regulation by authorities because a focus on the entire park is more efficient than evaluating each business separately;
- Isolating noxious or heavily polluting industries away from population centres and managing their pollution;
- Promotion of recycling materials or symbiotic output-input development for eco-industrial parks, such as waste to energy systems or by-product use;
- Parks can promote positive environmental conditions to international firms seeking locations that serve internal corporate guidelines and values for environmental impact;
- Centralized water/waste processing offers efficiencies that, due to scale, could not be achieved by individual businesses;



- Allows small businesses to access large scale pollution control technologies that alone they could not afford;
- Parks can serve as a test-bed for new technologies and processes and through demonstration show the benefits of environmentally sound practices to businesses and communities outside the park.

Public Policy Role

Industrial parks at their most basic can provide space and basic services to tenants, but they can also play a larger role by enabling local and national development policy. In adopting a policy role, the industrial park moves from being a landlord to being an organization that takes on additional functions, by promoting:

- Technology transfer and innovation by park tenants, and by facilitating adoption of new processes and products by resident firms. Firms in developing countries can have a late comer advantage that enhances competitiveness;
- Facilitation and adoption of higher value added processes or attraction of more advanced firms to the location;
- Local, female and indigenous ownership of firms that expands the range of active participants and entrepreneurs in a society;
- Environmental awareness and offering demonstrations and expertise around sustainable energy production such as wind/solar/biomass sources;
- Information channels to policy makers about the interests and needs of firms, especially for new industries seeking to be established.

2.5 Costs of Industrial Parks

Balancing the benefits of industrial parks are the costs of developing and operating parks and any subsidies needed to establish parks and associated infrastructure. Costs include economic, social and environmental costs of an industrial park development:

Economic Costs

Economic costs can be divided into the costs of establishing and subsidizing an industrial park along with indirect economic issues around possible distortion of the local economy. Some of the costs to be considered or mitigated include:

- Direct costs of parks include the initial investment and operating costs to be recovered through fees/leases and subsidies;
- Indirect economic costs may include inefficient use of resources, poor planning and location that does not serve the competitive interests of firms and makes tenant attraction difficult, and crowding out of local industrial land uses;
- Using public funds for park development creates an opportunity cost of resources that can be used for other purposes;
- Parks that offer tax and other benefits may cause firms to relocate from nearby areas without an overall gain in efficiency or productivity, and leave other industrial locations in worse circumstances or less competitive;
- Building a park needs to reflect a viable solution, so an industrial park in a location with limited economic activity may not gain any benefits from the investment. The park is a means to an end, not an end in itself;
- Distortion of the local economy to promote activities that may not have long term economic viability.

Social Costs

In addition to many benefits that an industrial park can provide to local residents, there are also potential negative impacts, such as:

- The location of an industrial park can influence the value of property, so depending on how the park is designed, externalities can affect nearby businesses and residents;
- The compulsory acquisition of land and resettlement of residents to obtain the space needed for an industrial park;



- The location of industrial parks near workers can be a great benefit, especially in areas with costly or congested transport, but locations away from the workforce can increase the burden of cost and time on those employed by the park;
- Distortion of existing comprehensive or master plans to serve the needs of the industrial park. This common tension arises when planning space for both business and social purposes because often the needs are different and planning must decide if the city is a place to live or a place to work, and a combination of both is possible.

Environmental Costs

Environmental issues are significant for most industrial parks. While parks can be forces for sound environmental management and impact, they can also contribute to environmental problems, including:

- Adding or expanding polluting industries can add to overall levels generated in the host city;
- Industrial parks near residential areas can create transportation based congestion and pollution to the surrounding area, as well as noise pollution;
- Failure to undertake and follow environmental impact assessments established by national or international standards.

Industrial parks can be designed to maximize benefits and minimize costs, although there are tensions between commercial demands that place pressure on production at lower costs compared to the cost of following standards that improve environmental and working conditions. In some cases, such as eco-industrial parks, it is possible to gain both economic and environmental benefits through creative and effective management.

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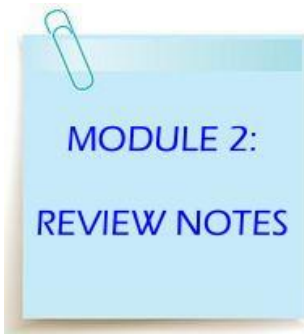
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- a. What will be the objectives you aim at achieving through the establishment of the Industrial Park in your country location? (e.g.: job creation, enterprise creation, commercialization of technologies, real estate investment, environment protection, etc...). Please describe in priority order:

- b. Who will be the target beneficiaries of the Industrial Park planned to be established in your country location? (e.g. per level of education, per working experience, per geographical location /nationally, internationally). Please describe:

- c. Which will be the focus sectors of the Industrial Park planned to be established in your country location?

- d. What you assess being the major benefits and costs in the establishment of the Industrial Park in your country location?



MODULE 3: GOVERNING THE ESTABLISHMENT OF AN INDUSTRIAL PARK

3. Ownership and Governance Models

One of the fundamental decisions to be made when establishing an industrial park is the governance and legal structure for its operations. The terms and definitions of industrial parks have evolved over time and may also have different meanings in different countries. This section starts with a discussion of the different ownership models for industrial parks, followed by the analysis of the legal context for parks and tenant businesses.

3.1 Introduction

An “industrial park”, as a term, has been subject to legal issues from the outset of its use in the early 1900s. A park is a highly planned district with attention paid to aesthetics and community capability that is subdivided and developed according to a comprehensive plan that provides for adequate streets and all necessary public utilities. Adequate control of the land, buildings and industrial operations is provided through zoning or private restrictions, e.g. covenants, incorporated as legal requirements in deeds of sale or lease. In addition, these regulations require continuing management and updating to assure an attractive and continuous use of land.

There are several commonly used models for ownership and governance of industrial parks including public ownership, private or public-private partnerships. Each form has its advantages and disadvantages, but in order to be successful all must choose strategic locations, be integrated into local infrastructure and supply chains, select or attract an appropriate set of firms and sectors, and be able to access the capital needed for park development.

After discussion of management models, this section will analyze the development process: ownership of the land prior to development; type of industry that will be allowed in the industrial park, public or private land use controls, licenses, environmental regulations

and ownership of the land after initial development.

3.2 Public Ownership

Public ownership usually requires the establishment of a specialized authority to own and operate the industrial park. Often, authority devolves from the national, regional or city government through existing national entities. These entities, such as airport/port operators, economic development agencies, universities, or public agricultural/manufacturing producers, then extend their own responsibilities to create an industrial park, or establish a new entity. The authority exercised by a public industrial park reflects its position in the governmental decision making hierarchy and specific rights as well as responsibilities detailed in the legislation used to create them.

Public ownership carries a number of advantages, including the ability to access finance, engage with public infrastructure decision making and development, incorporate social goals of community development, and to take a long term planning horizon that private owners may not be able to assure due to short term pressures for a positive return on investment. Public industrial parks also have access to governmental decision making, planning, and leadership to integrate park plans with broader economic and social goals. As a public entity, the industrial park would follow government guidelines and offer transparency compared to the greater privacy afforded by a privately owned industrial park.

Challenges of public ownership may include slower decision making due to its position within the governmental hierarchy, claims of unfair competition or greater benefits to tenants, compared to the private market for land and industrial support, slower reactions to market forces, and compliance with civil service or government rules for employment that may not serve the needs of a market based operation.

It is also critical to possess expertise in the industrial sectors and firms expected to operate in the industrial park that may differ from the skills needed in local and regional economic planning.



3.3 Private Ownership

Ownership by a private entity may allow faster reactions to market conditions, access to private capital markets, and low risk for the public sector. Among the challenges for private industrial parks is access to decision making around infrastructure, competition for investment funds with other firms and projects, and the ability to operate at an economically feasible scale to serve tenant industries. A challenge for government is that private industrial parks may not operate at a scale or direction preferred to meet government development goals. The government can also assist private industrial parks through business and industry incentives, supporting legislation, access to public land and capital.

3.4 Public-Private Partnership

Public-private partnership (PPP) is the most popular ownership model for industrial parks because it combines the public advantages of access to capital, linking directly to government development goals, along with private advantages of market experience and shared risk. Public-private partnerships also internalize the collaboration of public and private interests essential to industrial park development that may be harder for solely public or private owners.

The World Bank⁵ identifies a number of advantages and disadvantages of the PPP model that can be applied to industrial parks:

Advantages of PPPs include:

- 💡 Commercial expertise in site selection, tenant and sector selection, and marketing/promotion;
- 💡 Access to new technologies and commercial processes;
- 💡 Private sector focus on delivering on time and on budget;
- 💡 Developing local private capacity through joint ventures and sub-contracting to local firms ;

⁵ World Bank, 2016, Public-Private Partnership in Infrastructure Resource Centre for Contracts, Laws and Regulations

- 💡 Exposing public sector firms to private management culture.

Challenges of PPPs include:

- 💡 Nature of some PPPs may take longer and cost more to launch, because of the necessary communication and partner engagement;
- 💡 Political and social acceptance of the industrial park, especially if there are existing public parks that could be threatened by a new PPP;
- 💡 Need for government to guarantee rules and conditions as applicable to the park;
- 💡 Government may be held accountable for the PPP that could politicize the park;
- 💡 Government and private partners may have different tolerance for risk and failure and face different internal decision making environments.

Before embarking on a public-private partnership for industrial parks the government needs to be aware of the economic, legal and mindset needs of such initiatives. When government and private market assumptions, cultures, and practices diverge, the PPP will need to reconcile multiple sets of practices in order to be effective. To prepare for a PPP, government needs to build the capacity of its departments and agencies to deliver a PPP, it must also have in place the legal environment to sustain a PPP, as well as financing for related infrastructure development to serve the PPP.

It is important that the person and/or institution leading the establishment of an industrial park inspires trust in the local community

3.5 Ownership of Land prior to Development

After the initial decision has been made to develop the industrial park and an ownership model has been identified and the appropriate legal entity created, the question of land ownership must be answered. Preferably, a single ownership or relatively



few owners are considered to be the best alternative because there are coordination problems, time and expenses associated to acquisitions involving multiple ownerships.

The first issue involves the question of whether the initial developer of the industrial park will retain ownership of the land when the end user, e.g. the company manufacturing a product, occupies a park plot/shed. If the objective of the industrial park is the quick sale of available property, then it is important that the initial developer keep the legal form of ownership as simple as possible.

An owner whose property is being acquired may want an interest in the property thus allowing the developer to acquire the property at a much lower outlay than an initial purchase price. This would suggest that a partnership between the landowner and the developer would be the best form of ownership. There would be two options for this type of ownership; either a permanent arrangement or a lease arrangement partnership with an option to purchase.

In cases where multiple property owners are unwilling to sell or all wish to participate in the venture to acquire the park property, it may be possible to form a corporation. Shares of stock in the corporation are issued to the owners in proportion to the value of the land holdings and to the developer for investment and services. The appropriate legal form best suited to acquire land for an industrial park depends on the financial resources of the individual developer, the extent of participation by others in the project, the resources and profit desires of a community group, if any are involved in the project, and the policies of any governmental group interested in the project.

The amount of capital required as well as the difficulty in obtaining loans to purchase a sizeable site suitable for an appropriate park is frequently too great for an individual to bear alone. Consequently, the corporate form is usually the most common form of legal ownership. Private individuals will organize as a for-profit business corporation, while civic and governmental counterparts will organize a non-profit corporation to purchase the property.

3.6 Type of Industry allowed in the Industrial Park

An important issue, which involves legal permits for industrial parks, concerns the definition of “manufacturing” that is contemplated by the various documents that govern the establishment and operation of the park. The industrial economy has become much more than traditional manufacturing uses. A goal for this development has been characterized as “sustainable”.

The second issue deals with the legal description of the industrial uses contemplated in an industrial park. Rather than traditional manufacturing, the allowable land uses will consist of production, distribution and repair functions. While production activities are the main component of the industrial sector, they will not be successful without strong distribution and repair functions.

Production

This term is essentially the same as manufacturing. Sometimes, industrial parks wish to differ in their appeal to the manufacturing of durable goods, e.g. appliances, furniture and cars, as opposed to nondurable goods, e.g. food, pharmaceuticals or clothing. A way to distinguish these products is to require that anything produced in the industrial park have an anticipated “life” of three years or more, e.g. the difference between durable and non-durable goods. Industrial parks often appeal to smaller businesses, e.g. those with less than 50 employees, since these businesses often are responsible for the majority of new job creation. The types of production enterprise that will be attracted to an industrial park may be also different than those of the past. Instead of a vertically integrated operation, e.g. materials, manufacturing and distribution, contained in one structure, many businesses concentrate only on one aspect of this process. This suggests that new organizations will be smaller and may be interested in adopting new technologies.

Distribution

Producers need to deliver goods to their customers quickly and at the lowest cost by



having affordable access to raw materials. This suggests that various distribution businesses, e.g. wholesaling, warehousing, shipping and delivery, could be located in an industrial park.

Repair

Although these businesses are normally thought of being “service” industries, they are necessary to maintain an industrial base. These repair firms should be located near the market they serve, which usually includes the production of machines and technical equipment. These firms could also combine production, installation and repair.

3.7 Private Land Use Controls

One of the most important aspects of the development of an industrial park is a set of protective restrictions usually established by contract or in an attached deed between a developer and lessee of the property. These restrictions must be disclosed in advance before the end user of the property makes the decision to establish a business in the industrial park.

The **third issue** concerns the imposition of restrictions between the parties that assures compatibility between the industrial plants and between the industrial park and the surrounding community. The problem is to establish standards that are sufficient to prevent land use problems while retaining flexibility so as not to restrict the type and location of industrial plants. Covenants attached to deeds or leases can protect property values as well fulfilling the expectations of all parties in the development of the property.

There are many types of covenants or private restrictions that can be drafted and inserted into a lease or deed. Each legal system contains different requirements. For example, a covenant based on a set of laws derived from the English system has three requirements: the restriction must run with the land, it must “touch and concern” the land and it must be continually mentioned in the chain of title.

Other legal systems may have different requirements. More importantly, developers

of the property must consider the subject matter of these covenants:

Types of Operations Permitted

Residences and most commercial retail operations are prohibited. An exception to this might be those service facilities that are designed for the convenience of the occupants of the park. Uses may be permitted or prohibited. Standards by which these uses are allowed or denied could be by the product manufactured or by performance standards. These standards would prevent the establishment of “nuisance” land uses. They usually apply to smoke, noise, odor, waste, vibration, heat, light and so forth.

Size of the Parcel

A minimum parcel size for each structure is often established. Parcel sizes tend to be small in order to include as many industries as possible.

Site Coverage

There are usually restrictions placed on the percentage of the total area of any individual site that may be covered by a structure and/or a paved surface. Applicable percentages often run between 25 and 50 per cent. One of the problems in determining the appropriate percentage is that the higher the number, the less likely that there will be enough room to accommodate an expansion of the structure. This restriction should be coordinated with the size of the parcel provision previously mentioned in order to make sure that the user/purchaser of the property will have enough room to grow.

Building Line Setbacks

Most industrial parks require that buildings be located a certain distance from the front and side lot lines. New parks may require front setbacks of 10 to 30 meters and side yard setbacks of 6 to 10 meters. Another standard is to relate the amount of the building setback as a percentage of the lot depth and width of the frontage street adjacent to the lot. The purpose of these restrictions is to promote fire safety, provide an easier method of building identification and encourage a more efficient traffic flow.



Parking and Loading Areas

Industrial parks require all parking and loading areas to be located away from the street and be paved. There are a variety of provisions that can be implemented. These include requirements that all employee and visitor parking as well as truck loading be accommodated on the plant site. The number of spaces for cars, or other means of transportation, may be based on the number of employees working in the building, based on the two largest working shifts into consideration, or on the number of square meters of floor space in the building. Generally, parking is not permitted in the front yard area unless it is visitor parking that is usually screened. Employee transportation and truck loading areas are placed on the side or in the rear of buildings.

Outdoor Storage

Open outdoor storage is usually prohibited, unless there is adequate screening or fencing. The covenants may also wish to control the amount of indoor storage permitted.

Landscaping

Front and side yards must be landscaped according to predetermined standards. Often times there are requirements for number and types of trees, plants, grasses and so forth. In most cases, owners or occupiers of the property must maintain the original plantings for a certain time period.

Building Construction and Design

Many times developers of the industrial park will specify specific building standards. For example, the covenants would establish a building height, consistent with a one story structure. Other standards may include specifications of building materials, such as wood, masonry, stone, steel, etc., consistent with the approval of the developer's architects. An alternative to mentioning specific materials would be to propose a performance standard that would allow for the use of any material that met those requirements. Then the building owner could take advantage of any new technologies that became popular after the initial development of the industrial park. In this section the developer could insert the requirements for

LEED standards or other energy efficiency rating.

Sign Control

Permitted types and sizes of signs may be specified, usually with the permission of the developer. There are usually distinctions made between permanent and temporary signs.

Definitions of Business to be conducted

While this topic has been covered previously, permanent restrictions on the type of businesses that are allowed in the industrial park may provide investors and government agencies with an assurance that the park will be developed as proposed.

Expansion rights

The restrictions may also contain mechanisms for expanding the area and membership of the industrial park. This may involve provisions that would require the current landowners to approve any new members or businesses.

Other Provisions

There are a limitless number of other provisions that the developer might wish to insert in these conditions. These could relate to such concerns as requiring a specific period of time to begin construction of a building after a property is purchased or after a lease is signed. Of course, there should be provisions containing information on how long the covenants or restrictions should last, how they can be reviewed, changed or terminated as well as enforcement mechanisms. Other provisions might include requirements for waste disposal, traffic circulation and the approval of fences or walls.

3.8 Public Land Use Controls

There are many opportunities for a government to enact regulations that influence the location of an industrial park. These would include specific licenses, industrial policies, zoning for particular properties and environmental regulations. Since most developers want to know that legal requirements will remain in effect for an



extended period of time, e.g. the certainty issue, the question of when to enact or amend these governmental regulations is important.

The fourth issue involves the role of the government regulating the use of land by directly or indirectly allowing the establishment and operation of industrial parks. The extent of government involvement may depend upon whether the ownership and development of these land uses is undertaken by a for-profit or a non-profit entity. Industrial development is no longer the potential nuisance that caused communities to restrict the location of factories through public land use controls. Communities derive many benefits from establishing and maintaining industrial parks. There are a variety of methods a government can use to encourage industrial policy, regardless of whether it operates its own industrial park.

Mandatory Policy

The government agency can adopt a policy pledging future governmental activity that will support the role of industrial parks. This policy could protect the change of industrial land to nonindustrial land as well eliminate future land use incompatibility. An important benefit of an adopted policy is to provide certainty for industrial land owners that their investments in land and infrastructure will be protected.

Exclusive Industrial Zoning

Communities with the power to enact specific regulations on a parcel-by-parcel basis have occasionally enacted and enforced exclusive industrial zoning. Each district would be of a certain size, e.g. 20,000 square meters, and restricted to production, distribution and repair businesses. The problem with using this approach might occur if governments were allowed to permit non-industrial uses in the zone. If this was allowed to occur, it might cause landowners to lose confidence in the certainty and longevity of the zone.

Mandatory Owners Association

There are a variety of mechanisms that have been used to ensure that all owners of an industrial park participate in the decisions

concerning the operation and/or expansion of an area. Governments could mandate the establishment of an "Improvement District" that could be funded by assessments on each property owner and be responsible for such functions as public services, beautification, community services and the collection and dissemination of data about the park. This type of collective approach provides stakeholders with an important role in the management of the industrial park.

Licenses

Some governments may issue licenses for particular industrial parks after reviewing all the prescribed policies and regulations. This unified decision by one government may reduce the time necessary to collect multiple approvals from multiple levels of government in order to build the facility.

Another variation of this process is for a government or quasi-government agency to issue a "development license" in which the owners of the property are given one set list of requirements to meet in order to develop the projects. This list cannot be changed once the project owner has begun significant work on the project. Once all the requirements are met and reviewed by the same or a different organization, an "operating license" is issued.

Environmental Regulations

The development of an industrial park must comply with the government's environmental regulations. It is important to distinguish between those developments that are planned for previously occupied industrial properties, e.g. "Brownfields", and those that are to be developed on previously undeveloped property, e.g. "Greenfields". Industrial parks built on land that is the site of abandoned structures must undergo remediation in order to return the property to a condition that does not comprise an environmental hazard. Once this goal has been achieved, an environmental assessment of an industrial park should be undertaken. This assessment would estimate and analyze the environmental and indirect economic and social effects of development works on land, air and water resources. The organization operating the industrial park may offer incentives to promote additional environmental protection beyond the



minimum required by governmental regulations.

3.9 Ownership of Land after Development

After the initial property has been assembled and the type of development has been determined, the owner of the property satisfies any private and public land use restrictions. The next legal concern will be the type of organization that will operate the park, assuming that individual sites are not sold to individual businesses which will not be responsible to central management.

The fifth issue of ownership and legal topics involves the organizational structure of entities to operate an industrial park, once the initial developer has assembled the property. The type of organization selected will depend on the investment required, the availability of government support and the interest in making a profit.

There are many legal issues to consider when the type of organization to operate the park is analyzed. Many questions need to be answered. Should the organization be incorporated as a legal entity? Should this organization be considered to be profit or non-profit entity, such as a Chamber of Commerce? Should it be considered to be part of a governmental body or should it be private? Should a university be involved? If it is part of a government, should it be part of the executive function or a special district? Finally, should the management entity to the industrial park be part of an existing organization or should it be independent.

The most appropriate way to determine what type of organization would be appropriate to manage an industrial park would be to involve a four part process.

First, the goals and objectives of the industrial park must be satisfied. Second, the criteria for evaluating the organization must be analyzed. Third, there should be an evaluation of existing economic and industrial development organizations against this criterion. Finally, there should be a review of the types of new organizations that can be created to meet the criteria.

📍 Goals and Objectives

It is very common to create organizations for industrial parks and then establish the goals of these organizations. The result is that the goals may not reflect the desires of the end users of the industrial park. Instead goals are selected to fit the constraints of the organizational process, e.g. legal, financial or geographic issues. If the developer establishes the goals first it will be easier to determine the type of organization required to own and manage the industrial park. Obviously, all industrial parks have usually the goal of increasing jobs and incomes through the location of new firms. However additional options should be considered. For example, one industrial park may only want to diversify the industrial base and improve job opportunities.

Another industrial park may be interested in attracting as many firms as possible in order to increase its population. Other types of goals include attracting jobs for new workers, arranging employment for disadvantaged groups, attraction of environmentally sensitive or “sustainable” firms or having an emphasis on high-technology or advanced manufacturing techniques. Examples of specific goals might include: What types of job are to be created? What types of industries does the industrial park wish to attract? Does the industrial park wish to keep to its proposed size or contain room for expansion? Examples of specific objectives would include: build the industrial park; retain existing businesses; and develop a marketing plan.

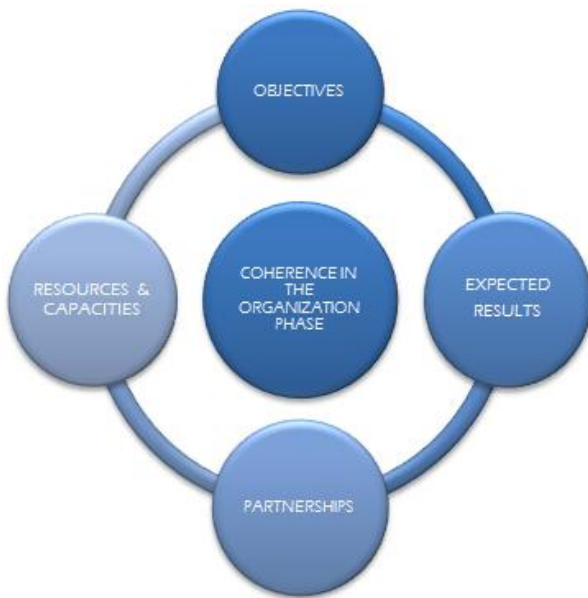
📍 Criteria for Evaluating the Organization

There are a variety of criteria evaluating an organization. These aspects can be prioritized, weighted or ignored depending on the goals of the industrial park. Some of these considerations include:

- Resources, e.g. people and money, or the capability to get them;
- Legal structure necessary to implement the goals and objectives of the industrial park;
- Representatives of the surrounding area including public and private sectors;



- Other programs of the organization that will not interfere with the development of the industrial park;
- Ability to receive government grants and loans that may be necessary to develop the industrial park;
- Available leadership that, if utilized, will not burden existing resources of other organizations;
- Creation of an entity that will not duplicate the work of another organization.



Review of Existing Organizations

Most locations already have an existing industrial or economic development organization. These include governments, public/private/partnerships or private organizations, e.g. Chamber of Commerce. The important point to determine is whether the existing organization is effective. If that is the case, then these organizations can be used to manage a new industrial park. Creating a new organization when an existing organization can manage an industrial park is very inefficient and wasteful. The decision to use an existing organization or create a new legal entity may depend on the following factors:

- Is there a history of ineffectiveness of the existing organization? A bad history is hard to overcome and local support may never materialize;

- An existing organization may only represent certain groups or segments of a community. A new industrial park needs support from the entire community;
- Many groups are in competition for existing resources. Placement of the power to manage an industrial park in one group may cause some groups to withdraw support for the park;
- The current organizational and legal structure may not allow an industrial park to gain the financial support it needs. In this case, the goals and objectives of an industrial park may be altered to fit an existing organization;
- Current organizations already have many activities to keep them occupied. A new industrial park should not be a secondary activity of any organization.

If this review suggests that existing organizations are appropriate for the task of managing a park, then a new organization is unnecessary.

Review of New Organizations

Creating a new organization may offer several advantages. First, a new organization will have as its only purpose the development of a successful industrial park. Second, a new organization can draw community attention and be a focal point for community support. Of course, creation of a new organization would create potential conflicts with other development ones.

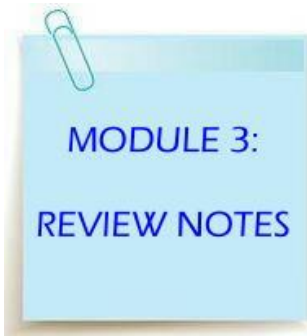
Non-profit corporations may be the most popular type of organization. They are relatively easy to establish and can involve multiple partners, e.g. universities or chambers of commerce. They may not be subject to taxation and they can receive governmental grants and loans. They can be funded through donations, membership fees, fund-raising activities and even the sale of industrial property. It is common for governments to contribute funds for the annual budgets of such organizations. For-profit corporations have a major advantage in that they can raise capital through the sale of stock. This sale can occur through efforts to encourage community members to purchase shares.



A problem with this form of organization is that the for-profit corporation may be subject to income tax. It may also become committed to profit and not to other goals, both economic and non-economic, thus lessening its interest in managing the industrial park for socio-economic objectives. A governmental organization can of course operate the park, it can use tax revenues, grants and other methods of government support to pursue the goals and objectives of the project. A potential problem might be that political problems could become more important than management of the park. In addition, a high turnover of political leaders may cause management issues in this organization.

3.10 Readings & Review

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- a. What promoters and/or sponsors should be involved in the establishment of the Industrial Park in your country location (local authorities, technical institutions, universities, NGOs, chambers of commerce, financial Institutions, business associations, large companies, etc.)?

- b. How is regulated land ownership and transfer in your country location? Can land owned by a public entity be transferred to a profit entity for Industrial Park development?

- c. Can be legally incorporated a partnership between public and private entities for Industrial Park development in your country location, in what form: non-profit organization, association, profit company, etc.?

- d. Has been set an incentive fiscal or financial policy and supporting legislation to access public land and capital for Industrial Park development in your country location?



MODULE 4: STRATEGIC PLANNING OF AN INDUSTRIAL PARK

4. Strategic Analysis & Planning

Industrial Park strategic planning addresses both the establishment and day-to-day operations of an industrial park, including the organization of park management and staff. This module presents a number of models of analysis and decision making to guide choices to be made during the planning and operations of industrial parks.

4.1 Introduction

Industrial parks are the result of many decisions that need to be well informed and data driven, if they are to result in successful projects. This module will introduce several approaches that can be used to inform decision makers around whether or not to proceed with an industrial park investment through to inputs into the design and management of industrial parks. The tools outlined cover a range of approaches to assist in the decision making process, and include:

- 📍 ALERT Model, which establishes a mindset for decision making and understanding that can be used to develop content for some of the later techniques;
- 📍 Data Driven Decision Making (DDDM) recognizes the value of having evidence inform industrial park development, from the decision to build the park, through its design to its daily management operations;
- 📍 SWOT analysis identifies the Strengths, Weaknesses, Opportunities and Threats associated with an organization and informs the strategic planning process;
- 📍 Strategic Planning is a process for an organization to establish its vision, mission, and values to inform decision making. This process results in guidelines that an industrial park can follow as it makes decisions about current operations and future development. Strategic planning should be also used by businesses, as they make decisions about their future operations.

📍 NCI Charrette System™ is a process developed by the National Charrette Institute at Michigan State University, to engage stakeholders in decision making. This approach is particularly valuable when engaging with local residents who may be affected by new development. The NCI Charrette System™ can be followed by industrial parks that are working with surrounding communities to maximize the benefits and minimize the disadvantages of a new development. This model is particularly relevant to enhance cooperation and inclusive partnership in park planning & management and will be presented in detail in the next module.


4.2. ALERT: A Framework for Analysis and Decision Making

There are many ways to process information and manage decision making, so managers of industrial parks need to evaluate different approaches to best meet their needs. One approach designed with urban planning and technology in mind is the ALERT framework (Corey and Wilson, 2006). ALERT is a mindset useful for planning decision making, as it helps planners invent and tailor their own place-specific solutions and processes. The ALERT framework asks planners and communities to raise their Awareness of changing geographic (Layers) and technological (E-Resources) forces and to positively and creatively react (Responsiveness) through information, collaboration and relational planning (Talk).

The elements of the framework in more detail are:

- 📍 Awareness: of existing assets and strengths and of potential opportunities to be competitive. In a rapidly changing global economy, awareness is a constant process that warns against relying on past information and practice for decision making. For example, in just a few years, solar power became competitive with fossil fuels, while mobile phone use rose dramatically. Before embarking on the planning process it is essential to be aware of the context and conditions influencing new development;



 **Layers:** represents the geography shaping planning decisions, not just the landscape of the location, but the position of the district/city/region in the national and global economy. There are many layers that would apply to an industrial park, including the geography or capital, inputs to production, labor force, regulations, transport networks and markets;


 **E-Resources:** is a reminder of the availability and use of technologies that impact production, consumption, and quality of life. In particular, communication and transportation affect the flows of information and materials, with many countries now having high rates of mobile phone use and innovative applications changing how information is used;

Table 4.1: ALERT Model applications to Industrial Park Planning and Management

Stage	Action	Industrial Park Examples
Awareness	Collect and evaluate current information about the state of knowledge	<ul style="list-style-type: none"> ▪ Identify/assess peer industrial parks ▪ Best practice standards for IP planning and management ▪ Identify/assess public policies affecting industrial parks ▪ Experience of current IP tenants/stakeholders ▪ Establish processes for on-going data collection and use in decision making ▪ Draw from SWOT and Strategic Planning ▪ Future expectations for changes in IP operating environment
Layers	Position in relation to geographic location and linkages to the global economy	<ul style="list-style-type: none"> ▪ Industrial location factors ▪ Relationships between IP and its host city, region and country ▪ Logistics and supply chain efficiency ▪ Input sourcing and export destinations ▪ Trade advantages and barriers
E-Resources	Availability and use of technologies that shape the economic and business environment	<ul style="list-style-type: none"> ▪ Application of technology to construction and management of industrial parks ▪ Role of telecommunications and the internet in park and tenant operations ▪ Recognition of bottlenecks in technology applications that hinder IP development
Responsiveness	Ability of institutions to recognize and respond to changing conditions	<ul style="list-style-type: none"> ▪ Talent and decision making ability of the IP management team ▪ Openness to emerging entrepreneurs and new products/industries ▪ Efficiency of government and stakeholders to react to change with meaningful decisions ▪ Management systems that use feedback to refine decisions and operations
Talk	Using communication channels and leveraging social networks to improve engagement and decision making	<ul style="list-style-type: none"> ▪ Quality and frequency of communication between IP stakeholders and management ▪ Inclusiveness of networks: women/minority/young entrepreneurs ▪ Efficiency of networks to inform decision making and react to changing conditions



- 💡 Responsiveness: concerns the ability of district/city/region to recognize foster change. This element addresses the willingness and ability of institutions: government, business, and non-governmental organizations, to understand and react to change. In turn, responsiveness shows the importance of local, city, region, and national leadership in the planning and development process;
- 💡 Talk: is an often ignored element of the planning process; the need to communicate and exchange ideas. This element asks participants and stakeholders in the industrial park planning process to engage in ongoing dialogue and debate about decisions and policies. Talk refers to a continuous process of engagement and collaborative behaviors among stakeholders. This process is especially important for eco-industrial parks where greater integration and collaboration is essential to achieve symbiotic benefits.

4.3 Data Driven Decision Management (DDDM)

Decisions based on intuition or a narrow experience fail to take into account the full breadth of the phenomenon. The absence of accurate data means that decisions are based on incomplete or incorrect information that has the potential to waste resources and jeopardize the viability of a project or business.

The use of information and data is a long standing foundation for decision making, although recently the greater availability of information and demands for accuracy and accountability have promoted this approach. Before continuing it is essential to emphasize that data driven decision management is a process and not a technique used occasionally. The process demands that the business has a mindset recognizing the role of data and using that information in rigorous ways. The need for information and the integration of the process into a management mindset comes at the cost of

collecting and analyzing data that takes money and time to assemble.

DDDM is not a shortcut to save time and money, but an approach to maximize the efficiency and value of decision making. By embarking on a DDDM path, the industrial park needs to recognize the implications for schedules and cost, and to recognize that DDDM is not an end in itself, but a valuable tool to inform decisions by the organization. The end is better decision making, with DDDM simply the vehicle to achieve that end.

In the previous section, the ALERT model has been introduced and the need for information, especially in the initial stages when awareness of conditions is emphasized. In a Harvard Business Review study of decision making, firms that utilized data driven decision management were found to be more productive and profitable (McAfee and Brynjolfsson, 2012).

Determine the decisions that need to be made and work backwards to identify the metrics necessary to inform that decision.

In choosing metrics, the information must be timely, accurate, and easy to collect, informed by factors such as:

- 💡 Data source is trusted;
- 💡 Data represent the information needed for decision making;
- 💡 Knowledge of the assumptions on which data are collected that may shape its meaning.

Once data has been assembled, it needs to be analyzed and understood, with meaning derived from the analysis. The use of basic statistics can provide the tools necessary to understand trends, changes, and associations between factors.

It is always important to note that association does not mean causation, which can lead to erroneous decisions based on poor data analysis. Data are used for a wide range of purposes, and several will be discussed in this section, as the strategic planning process and the use of SWOT analysis are addressed, as both a consumer of data and provider of intelligence for decision making.



One example of data driven decision management is by the Kalundborg Eco-Industrial Park (Denmark), which was founded in 1959 and starting in the early 1970s focused on the sharing of waste products as raw materials.

Recently, Kalundborg wanted to identify and utilize symbioses between businesses in the park, which housed a power plant, oil refinery, pharmaceutical production, cement production and local farmers (Hein et al, 2016). Information on business symbioses was collected using a number of techniques including:

- 📍 Matchmaking events that brought together business leaders from the industrial park to brainstorm and also build trust with each other. The success of this process depended on as many firms as possible participating and being willing to share information;
- 📍 Business association meetings as a forum for the industrial park to gain information about resource needs;
- 📍 Related stakeholders including non-governmental organizations and government agencies that had an interest in the success of the industrial park as well as the potential to provide financial support;

The objectives of the process were identified by Hein et al (2016) as:

- 📍 Screen large numbers of industrial plants and their input/outputs to form symbioses automatically;
- 📍 Identify technologies for converting a specific waste into a resource automatically;
- 📍 Perform screening under incomplete information: Known - Type of business, size, types of wastes; Unknown - Quantity of resources and wastes.

The result of the analysis was the identification of two new symbioses that had not been previously recognized: the use of refinery flare gas as an input for the power plant, and the use of yeast slurry produced by the pharmaceutical firm, as feed for local pig farms.

The industrial park knew most of the potential symbioses, but taking a methodological and data driven approach allowed it to find new relationships that served the business and environmental needs of the park.

4.4 SWOT Analysis

A SWOT analysis is a simple technique to understand the condition and potential of a business or investment, such as an industrial park. SWOT refers to the four core elements of the analysis: Strengths, Weaknesses, Opportunities and Threats.

Strengths and Weaknesses refer to the internal condition of the subject organization, while Opportunities and Threats consider how external forces might affect the organization. A SWOT analysis can be conducted on a firm in an industrial park, or the park as an organization itself. It is awareness and planning process to inform decision making. The elements of the analysis are:

- 📍 Strengths – positive characteristics that can be controlled by the organization;
- 📍 Weaknesses – negative characteristics that can be controlled by the organization;
- 📍 Opportunities – advantages the organization can access;
- 📍 Threats – external challenges to organizational success;

An example of a SWOT analysis for an eco-industrial park in India has been conducted by Patnaik and Poyyamoli (2015). Their results are presented in the following matrix form (Table 4.2), a format commonly used for SWOT analyses. Note that in this case, the strengths and opportunities stem from the capacity and responsiveness of the park and its tenants, while the threats and weaknesses often relate to attitudes/mindset of the host, the planning process, along with resource and information limitations.

Undertaking a SWOT analysis provides a framework for assessing the organizational, economic, and resource forces shaping an industrial park's development.



Table 4.2: Country Case: SWOT analysis for developing an EIP in Puducherry region, India

Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Regional development agencies and authorities ▪ Proactive government ▪ Close proximity of industrial units ▪ Good social and financial infrastructure ▪ Existing academic base and expertise on Industrial Park ▪ Effective work culture ▪ Increasing awareness 	<ul style="list-style-type: none"> ▪ Reluctant and conventional mindset ▪ Lack of reliable data and information ▪ Insufficient management system and pro-active policies and planning ▪ Limited decision-making power ▪ Lack of financial resources ▪ Lack of trained manpower in the industries, who can plan and implement Industrial Park strategies
Opportunities	Threats
<ul style="list-style-type: none"> ▪ Industrial diversity ▪ Compatible tenants ▪ Anchor tenants ▪ Anticipated demand to initiate environmentally friendly initiatives ▪ Pre-existing synergy base ▪ National and International Cooperation 	<ul style="list-style-type: none"> ▪ Traditional mindset (apathy, reluctance, etc.) against emerging concepts like Eco-Industrial Park; ▪ Narrow focus on short-term economic benefits over eco-efficiency and long-term benefits; ▪ Lack of policy innovation; ▪ Lack of communication between policy makers and scientists; ▪ Constant need to launch new facilities to meet the needs of companies

4.5 Strategic Planning Process

Another approach to decision making is the strategic planning process, which lays out a vision for a business or organizations and set the values and steps involved in achieving a vision.

Strategic planning is valuable when establishing an industrial park and as a regular activity to review progress and plan for future developments.

The end result should be a concrete plan that clearly lays out direction, tasks, and even units or personnel involved. There are several stages common to the strategic planning process as applied to industrial parks.

The stages of strategic planning can be defined in different ways but all share the common elements listed in next Table 4.3.

The strategic planning process can be time consuming and needs commitment from organization leadership and all stakeholders if it is to be successful. Strategic planning is not an end in itself, but a means to an end, it is a way to establish direction for an organization and to lay out paths to reach agreed upon goals. The stages of the process are:

Stage 1: As discussed earlier concerning data driven decision management, it is essential to have information on which to base decisions. In the absence of information, decisions will be made based on outdated ideas, guesses or even emotion, which may not be accurate assessments of the current state of the organization. At this stage, large organizations may establish a steering committee to undertake many of the tasks that are then later reviewed by all



stakeholders while smaller organizations can engage all stakeholders directly if they wish:

- 📍 Collect data relevant to decision making such as organizational costs and revenues, financial trends, broader economic data for region/country, global economic trends, and projections for future years ;
- 📍 Analyze the current state of the organization based on accurate data (data driven decision management), and develop scenarios of possible future economic, business, social and political conditions that affect the organization;
- 📍 Undertake SWOT analysis to inform decision making and to develop consensus around the different factors influencing the future development of the organization;
- 📍 Identify participants able to take the time to be fully engaged in the process that include or represent the organization and its stakeholders. Organizations may wish to employ an impartial facilitator to create and run the strategic planning process, which is especially useful when there are many participants or when organizational direction is a source of conflicting ideas or tension among participants;

- 📍 Reserve uninterrupted time for discussion because the development of the vision, mission, values and goals for an organization should not be interrupted or seen as a secondary responsibility.

Stage 2: After assembling information and people, the next stage is the development of a strategic framework for the organization. Some of the elements to consider at the stage are:

- 📍 Future vision for organization that incorporates an aspirational yet achievable state of what the organization wants to become. Vision is often determined by an organization’s leadership although it needs to reflect broader culture within the organization if it is to be representative;
- 📍 Define the mission of the organization, which is what the organization currently does or wishes to do in the future. The mission can include why an organization exists and what is would like to achieve in the future.

Government organizations may have a mission defined by the state or legislation, while private organizations have greater flexibility in how they determine their mission.

Table 4.3: The Strategic Planning Process

Stage	Tasks
1. Preparation	<ul style="list-style-type: none"> ▪ Collect data ▪ Analyze current state of organization ▪ Undertake SWOT analysis ▪ Identify participants ▪ Reserve uninterrupted time for discussion
2. Strategic Framework	<ul style="list-style-type: none"> ▪ Future vision for organization ▪ Define mission of the organization ▪ Identify organization values
3. Define Objectives	<ul style="list-style-type: none"> ▪ Set objectives ▪ Establish metrics for evaluation
4. Implementation	<ul style="list-style-type: none"> ▪ Create initiatives ▪ Assign responsibility ▪ Establish timelines for action
5. Evaluation	<ul style="list-style-type: none"> ▪ Review process and outcomes ▪ Refine if needed



Care needs to be taken not to include values and vision in the mission statement as these aspects of the organization have their own role in the process.

- Identify organization values through discussion and information gathering with employees and stakeholders. The result is a statement about how an organization does its work and the characteristics that make it unique.

Stage 3: Having defined a vision, mission and values the next stage focuses on setting objectives that the organization aims for as it develops. Often, the terms goals and objectives are used interchangeably, and if all in the organization understand the meaning there should not be any problems.

Generally, goals are seen as something to achieve as an end point, while objectives have a broader meaning that takes the form of general guidance. Regardless of term, the setting of goals and objectives needs to be measured or widely understood in order to implement a strategic plan.

Stage 4: Once a framework has been established the next stage is to implement the strategic plan. This stage requires that tasks/projects are defined, responsibility assigned and timelines for completion established:

- Create initiatives that will achieve the objectives set out in Stage 3, which may range from simple tasks undertaken quickly to long term projects;
- Assign responsibility to each task, project or initiative and provide the authority to each person to achieve the stated objectives.

Each initiative needs to be endorsed and supported by organization leadership, and resources provided to achieve the stated objectives;

- Establish timelines for action including dates for project review and completion.

Stage 5: Once a strategic plan has been implemented the responsibilities do not end.

Effective strategic planning also includes evaluation of the process and all projects associated with the plan. This allows the measurement of progress and provides feedback for ongoing planning decisions. Finally, a strategic plan is an ongoing process that needs regular review and revision.

An organization may choose to meet annually on its strategic plan to review progress as well as to determine if any conditions have changed to alter the previously determined direction.

A summary of the strategic planning process for the KADDB Industrial Park located in Khalidiyah, 50km north of Amman, Jordan is presented in Table 4.4.

The park focuses on defense and automotive industries offering advanced infrastructure, a secure environment and free trade zone status. The park has an informative website that promotes the location and services for local and international firms: <http://www.kaddb.com/en-us/>

The strategic planning information for the park is listed on its website and clearly establishes the vision, mission and objectives of the park. Transparency of its direction is also a statement of confidence to park businesses and potential investors.

The language and direction are clear and the values and objectives offer actionable tasks and goals that can be assigned and measured.

This result has the elements needed for a future strategy but not all strategic plans need to look like this or have the same type of content. A strategic plan is unique to the organization that produced it.



Table 4.4: Country case: Summary of Strategic Plan for the KADDB Industrial Park, Jordan

<p>Vision</p>	<p>To create a state of the art Industrial Park that specializes in defense and military industries.</p>
<p>Mission</p>	<p>To create a secure and efficient investment-attractive environment at the heart of the Middle East to host investors and manufacturers from defense and military industries. The Park will nourish the development of Industrial clusters, and work to realize the following objectives:</p> <ul style="list-style-type: none"> ▪ Enhance the growth of specialized industries in Jordan; ▪ Provide the means and mechanisms for transfer of advanced technology and creative business models to Jordan; ▪ Help raise the standards of Jordanian manpower to the benefit of citizens and strategic partners.
<p>Values</p>	<p>Partnership with investors:</p> <ul style="list-style-type: none"> ▪ Partnership with customers does not necessarily mean a contractual partnership. It means that the success of investment projects in the Park is the Park's top priority and the principal pillar of its success. ▪ Companies that are in the Park at present are joint ventures between KADDB and one or more international companies. The Park is the natural habitat for the export oriented industrial models that emerge from KADDB's research and development activities. ▪ KADDB Industrial Park is the first and only zone located at the heart of the Middle East that offers an ideal environment for investors who want to invest in defense and automotive industries. Investments in the Park are guided by the objectives of KADDB, which give investors the freedom to establish their projects on their own or as joint ventures. <p>Maintaining a high level of services:</p> <ul style="list-style-type: none"> ▪ Establishing a training center that works to develop trained and qualified human resources to support investors and industrialists in the KADDB Industrial Park and industries in Jordan. ▪ A world class infrastructure consisting of paved roads, electricity generation and supply, water and sanitation networks and advanced telecommunications. ▪ Security surveillance and monitoring 24-7 inside and outside the KADDB Park. <p>High caliber of management and staff:</p> <ul style="list-style-type: none"> ▪ KADDB Industrial Park recruits highly qualified staff who understand the concept and philosophy of Industrial free zones and how to work in them.



	<p>Preserve health & the environment:</p> <ul style="list-style-type: none"> ▪ A firefighting water network is integrated within the Park. ▪ Waste-Water Treatment Plant for the park to maintain the ecological balance of the land. ▪ A 608,500 m² green area planted with trees surrounds the zone, providing a security buffer and an ecologically beneficial belt around the industrial park. <p>Ensure safety through standardization of procedures:</p> <p>KADDB Industrial Park benchmarks itself against:</p> <ul style="list-style-type: none"> ▪ International free industrial zones standards. ▪ International environmental quality standards. ▪ Labor standards. ▪ The highest security standards. ▪ Clear and codified procedures for the administration of the Park in accordance with international best practice. <p>Commitment to excellence through:</p> <ul style="list-style-type: none"> ▪ Computerization to streamline the Park’s procedures, facilitate customs procedures, and ease the flow of goods to and from the Park. ▪ Providing computerized security and control arrangements. ▪ Providing a one-stop-shop. ▪ Providing logistical marketing support to investors in the context of promoting the Park, which includes participation in defense industry fairs in Jordan and abroad.
<p>Objectives</p>	<p>To become the premier defense and automotive dedicated industrial park in the Middle East.</p> <p>To expand the developed area of the Industrial Park according to the Master Plan.</p> <p>To assure that existing investors are satisfied and that their business operations in Jordan succeed.</p>

Dube TradePort is a logistics center, based in South Africa, linked to Durban’s international airport and its port, both significant transportation hubs for southern Africa. The TradePort is an industrial park and special economic zone run by the province of KwaZulu Natal. The park combines many elements including an international airport, dedicated cargo terminal, warehousing, offices, retail outlets, hotels and agricultural

operations spread over 2,940 hectares. Dube TradePort developed a strategic plan in 2015 to address its growth and development, with the results summarized in Table 4.5. Note how the elements are forward looking, aspirational, and asking stakeholders and the organization to seek a more sophisticated and advanced facility in the future that is integrated into the local/national economy and community.



Table 4.5: Country case: Summary of Strategic Plan for Dube TradePort, South Africa

Vision	To be the leading global air logistics platform in Southern Africa, seamlessly integrated with inter-modal road, rail and sea infrastructure
Mission	<p>To enable the development of an aerotropolis by providing leading edge spatial planning and infrastructure</p> <p>To attract investment through the creation and operation of a special economic zone and related commercial zones</p> <p>To grow business and trade through enabling new regional and international air services</p>
Values	<p>Professional Excellence: Being passionate about value-adding professionalism</p> <p>Ubuntu: Creating open, honest relationships, built on trust, mutual respect, dignity and fairness</p> <p>Empowerment: Actively embracing the economic transformational and developmental agenda of stakeholders</p> <p>Innovation and Creativity: Succeeding through innovative, creative and adaptable teams</p> <p>Service Excellence: Providing unsurpassed service excellence of which our clients may be proud</p>

4.6 Readings & Review

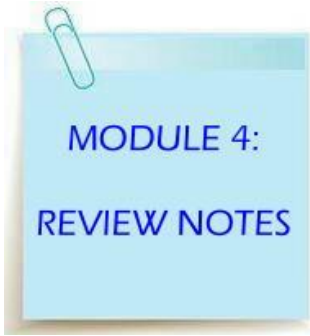
1) Dube TradePort Corporation, 2015
 "Strategic Plan 2016-2020"
<http://www.dubetradeport.co.za/SiteFiles/61119/DTPC%20Strategic%20Plan%20015-2020.pdf>

2) Hein, A.M., Jankovic, M., Farel, R., and Yannou, B., 2016
 "A Data-and Knowledge-Driven Methodology for generating Eco-Industrial Park Architectures." Paper presented at ASME 2016 International Design Engineering Technical Conferences and Computers and

Information in Engineering Conference IDETC 2016 August 21-24, Charlotte, North Carolina.

https://www.researchgate.net/publication/307855130_a_data-and_knowledge-driven_methodology_for_generating_eco-industrial_park_architectures

3) Patnaik, R. and Poyyamoli, G, 2015
 "Developing an eco-industrial park in Puducherry region, India – a SWOT analysis." Journal of Environmental Planning and Management, 58(6): 976-996



- a. Do you apply Strategic Analysis & Planning to your current operations? If yes, in what activity?

- b. Have you ever applied the Strategic Analysis & Planning models presented in this module? If yes, what model and for what purpose? If not, have you applied other models?

- c. Do you find clear the Strategic Analysis & Planning models presented in this module for future application to the establishment and management of industrial parks in your country location? If not, what modules are not clear?

- d. For future use, what model presented in this module you find more appropriate to your need of Strategic Analysis & Planning of industrial parks in your country location?



MODULE 5: MANAGING PARK STAKEHOLDERS ENGAGEMENT & COOPERATION

5. Management Practices to Enhance Collaboration and Cooperation

One valuable set of skills for industrial park and business management is effective collaboration and cooperation. The very nature of an industrial park is based on the collective benefits gained by sharing space and resources to enhance economic development. This module considers ways to undertake collaboration, in some fields, called the Charrette approach.

5.1 Introduction

Planning and building industrial parks can be complicated. These projects involve a large number of people and information variables. Industrial parks propose to bring together an array of businesses, suppliers, transportation networks and support systems. Increasingly, government and business leaders are realizing that the best way to achieve a successful built project is for all of the various parties involved in an industrial park to work collaboratively. However, many people still fear that broad collaboration only leads to endless meetings and long, expensive project time lines without anything ever getting built.

How can collaboration be managed to create success for all stakeholders involved in the project process?

The NCI Charrette System is aimed at getting everyone involved in industrial park projects, from the government to the tenants, to work together to produce a successful project in a timely manner. Benefits of this process include that it saves time and money through compressed work sessions and short feedback loops and increases probability for implementation through an integrated team design approach that includes all decision makers.

A Charrette is multiple-day collaborative design event. A Charrette fosters broad ownership of a project by including stakeholders before the start of design and maintaining inclusion in the process going forward throughout the evolution of the plan

for the industrial park. During a Charrette, a multidisciplinary Charrette team consisting of consultants and sponsor staff produce a project. This is done in close consultation with stakeholders through a series of feedback sessions.

The goal of the Charrette is to create a feasible plan that will require minimal rework through approvals and implementation.

Many Charrette plans result in up to 70% completion of schematic design. This result requires careful Charrette preparation that assures that all the right data and all the right people are involved in the Charrette feedback sessions. Key to the NCI Charrette System™ is the careful orchestration of a series of feedback/ review sessions, or feedback loops, wherein all interested parties are involved at key decision-making points. Involvement in these feedback loops, accomplished through small and large group meetings, promotes understanding, involvement and ownership of the project plan by all Charrette participants.

The NCI Charrette System™ is a three-phase, accelerated, collaborative project management process during which a multiple-day Charrette is held as the central design event. It is a systemized yet flexible approach intended to assure that the right people and the right information are available at the key decision making moments in project planning. The three phases of the NCI Charrette System™ are (1) the Research, Education and Charrette Preparation phase, (2) the Charrette Planning, and (3) the Plan Implementation phase.

5.2 Phase 1: Research, Education and Charrette Preparation

Phase one commences at the project start and can last anywhere from 6 weeks to 4 months on average, depending on the number of stakeholders and the technical complexity of the project.

The goals of phase one are to:

- Gain a shared agreement between project sponsors regarding the project purpose and process;



- 📍 Identify and involve stakeholder viewpoints;
- 📍 Gather necessary base data ;
- 📍 Create a positive political environment ;
- 📍 Complete Charrette logistics preparation.

Project Start-up Intensive

The project start-up intensive is a meeting or series of meetings with the industrial project team: the project sponsor, local government staff, businesses, funders and possibility world organizations.

During the project start-up intensive, project team members develop a shared agreement on the project purpose, scope including guiding principles, objectives and performance measures, stakeholder involvement plan, and the project process roadmap. These agreements describe the basic terms of the project that define the schedule and budget. The purpose of this meeting is to assure a solid basis for project success by gaining a set of shared agreements between the project sponsor, partners, and consultants, creating a collaborative team approach that will carry the project through engineering and implementation. In completing this work, the project team lays the foundation for a shared team approach wherein everyone shares and supports the project process.

📍 Guiding Principles

The project start-up intensive begins at the biggest picture level of work, focusing on the Guiding Principles, which represent core values that guide decision making throughout the planning and implementation of a project.

Guiding Principles keep the project team and Charrette participants on task, are used to resolve conflicts of opinion and help avoid costly rework and unnecessary effort that stems from following tangents to the core purpose of the project. Ideally, Guiding Principles are written in a way that decisions can be tested against them.

Example Guiding Principles are:

- The industrial park will serve as an economic catalyst for the region;

- The industrial park will be a model for sustainable design practice in saving of energy and resources;
- The industrial park will provide easy access to freight transportation.

📍 Project Objectives and Measures

Next, the project team creates a shared agreement on a set of clear, specific, measurable, and achievable objectives for the project. These objectives are directly derived from the Guiding Principles. Establishing a set of measurable objectives helps make the Charrette process more open and builds trust between all parties. The Objectives and Performance Measures ultimately find their way to the Charrette, where they serve as a set of metrics or indicators that are used by the Charrette team to qualify and quantify the performance of alternative plan concepts. It therefore becomes an invaluable document for validating the Charrette decision-making process and explaining it to those who enter the process at a later date.

Example Project Objectives and Measures are:

- Objective: the project will accommodate all storm water on site;
- Measure: the area of on-site water filtration;
- Objective: the project will be located along major transportation routes.
- Measure: the number of transportation modes adjacent to and on the site.

📍 Stakeholder involvement plan

The NCI Charrette System™ identifies three circles of stakeholder involvement. The primary stakeholders are in the inner circle and attend the most meetings. Most commonly these are the project sponsors and key partners such as a funder or the city planning agency. Secondary and general stakeholders attend progressively fewer meetings. These are the local business organizations, transport agencies and companies and potential tenants. While these categories do roughly indicate the amount of involvement, they must not become an elite hierarchy. In order to make the best use of people's expertise and time, some will attend more meetings than others. The point



however, is that all stakeholders are involved at the moments of key decisions, such as the analysis of alternative concepts and review of the preferred plan. Everyone should feel satisfied with their level of involvement and trust that their input can have an impact on the outcome.

Following are the five categories of stakeholders that should be considered for involvement in the Charrette:

1. Decision makers. If decisions are being made in any given meeting, decision makers need to be present. Decision makers might be agency or local elected officials, who approve plans, zoning and public finance. They might be the head of the transport agency with approval power.
2. Those directly affected by the outcome. Anyone whose property or business is affected should be involved throughout the project process. Those living or working within the project area should be also represented.
3. Those who may provide valuable information for the project. This group usually includes people with local knowledge of stakeholders and politics who may not be on the consultant team.
4. Those who have the power to promote the project. Supporters too often sit on the sidelines. Stories of successful projects usually include the active participation of one or several project champions. Supporters might be the elected officials, a University or a local business association.
5. Those with the power to block the project. If there is any hope of gaining the support of opponents, it is better to bring them into the process earlier rather than later. These may include neighbors to the proposed project site.

Base Data Research and Analysis

Base data tasks assure that all relevant analysis and information is available to the team during the Charrette. Any shortcoming in this area may compromise design accuracy

that can result in costly rework and a waste of limited resources. Base Data Research and Analysis is conducted concurrent with the stakeholder outreach as directed by the Charrette System Roadmap. During the Charrette, the Charrette team needs a complete set of accurate base data and studies in order to complete the Charrette products and design the project to the level of detail required to assure feasibility. Members of a Charrette team should be experts on all base data concerning their areas of specialty. Each specialty on the team is responsible for completing, at minimum, an existing conditions analysis prior to the Charrette that serves as a guiding document for the Charrette team.

Stakeholder Engagement

The project team should interview key stakeholders before the Charrette. The interview process can be conducted one-on-one or in small groups. The stakeholder plan identifies the interview format for each stakeholder. These interviews provide the project team with valuable information for the design Charrette. It can be also helpful to conduct one or more educational events before a Charrette. Industrial parks are complex projects and it can take time to properly inform a community about the various subjects they need to understand to be informed participants in the planning process. These educational events can reduce the learning curve and assure a more informed group of participants at the Charrette.

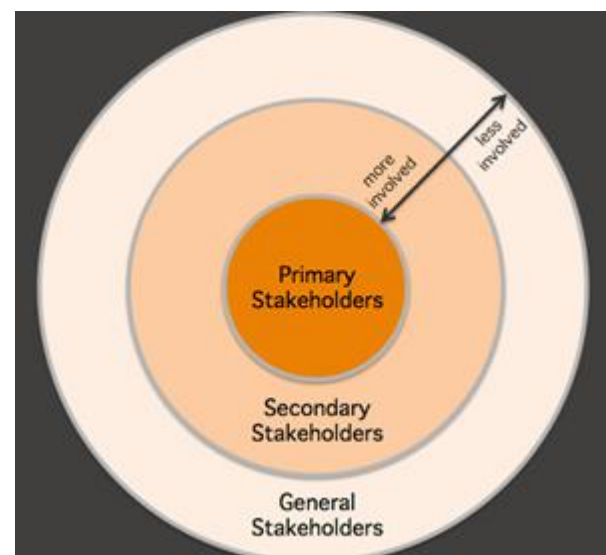


Image courtesy of National Charrette Institute



Charrette Design Team Formation

The Charrette team is the core group of planners, designers, engineers, economists, and others working virtually uninterrupted in the Charrette studio, taking a project from a cold start to a preferred plan in a matter of days. Decisions about whom to include on the Charrette team can mean the difference between success and failure of a Charrette.

These talented professionals must be chosen for their ability to solve the design problems and complete the required Charrette products and documents through an interactive team process.

The Charrette team is commonly chosen and contracted through a publicly offered request for qualifications or proposals (RFQ or RFP). In developing the list of required specialties, the project sponsor refers to the Charrette purpose and product list and the required base data research.

Charrette System Roadmap

The final task during the project start-up intensive is the drafting of the Charrette System Roadmap, a chart that identifies the critical path activities over the course of a project. The Guiding Principles, Objectives and Performance Measures, Stakeholder Analysis and Charrette Purpose and Products provide the content for the organizational, outreach, education, data gathering and analysis, logistical tasks, deliverables, and events that drive the entire project schedule.

An important purpose of this exercise is to assure that the project team has a shared understanding of the project process and timing. There is no better way to accomplish this understanding than for this group to co-author the Charrette System Roadmap.

5.3 Phase 2: The Charrette Planning

The Charrette is the creative, transformative event of the NCI Charrette System. It occurs after the completion of the Research, Education and Charrette Preparation phase. The goal of the Charrette is to produce a feasible plan with minimal rework that benefits from the support of all stakeholders through its implementation. This support is

facilitated by the ability of the Charrette to transform the mind-sets of all stakeholders.

A Charrette for the planning of an industrial park lasts approximately three to five days. A multidisciplinary Charrette team, consisting of consultants and sponsor staff, produces the plan. Stakeholders— meaning anyone who can approve, provide valuable information, promote, or block the project, as well as anyone directly affected by the outcomes— are involved through a series of short feedback loops or meetings. The relationship between the stakeholders and the Charrette team is somewhat like the passenger to the taxi driver. The stakeholders are like the passengers who tell the experienced taxi driver where he or she wants to go. The taxi driver is trusted to know the best way to get there.

The Charrette makes the best use of people's time by involving them when their input will have the greatest impact. No one should feel left behind or undervalued. Some people attend more meetings than others, but all are consulted during open design review sessions at key decision moments. These review sessions are called feedback loops. These feedback loops provide the consultant team with the information necessary to create a feasible plan. Just as importantly, they allow stakeholders to become co-authors of the plan so that they are more likely to support and help implement it. A Charrette has at least three feedback loops.

The experience of many Charrette practitioners has shown that three is the minimum number of interactions necessary to take a group of stakeholders through a complete design process. The first feedback loop is to review a large group of alternatives, the second is to review a preferred plan, and the third is to review the fully developed and tested plan. It takes at least this much interaction with people to gain their input and support for a plan.

The Charrette opens with a meeting with all the project stakeholders. The Charrette team then breaks off to create alternative plans or scenarios, which are presented in a second stakeholder meeting, usually a day or two later. The Charrette is organized as a series of feedback loops through which stakeholders



are engaged at critical decision-making points. After gathering feedback at the second stakeholder meeting, the team synthesizes the best aspects of the alternatives into a preferred plan that is developed in detail and tested for economic, design and political feasibility. The Charrette concludes with a comprehensive presentation at a final stakeholder meeting.

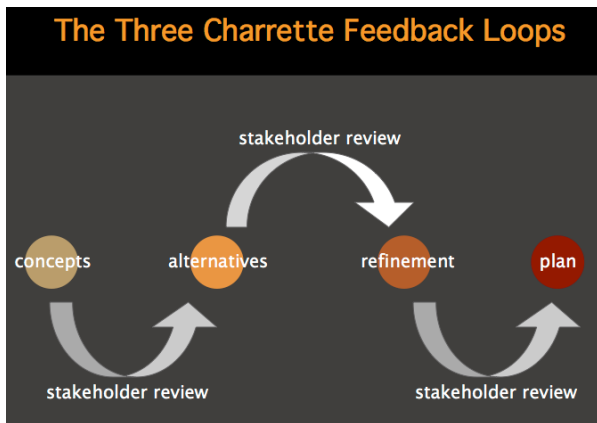


Image courtesy of National Charrette Institute

A key reason that a Charrette needs to be at least three days is to accommodate the three feedback loops. Three to five days are also required to accommodate both the scheduled and the ad hoc meetings when there are a large number of stakeholders. Finally, the complexities involved in designing industrial parks may require extra time to create a feasible design solution.

During the Charrette, the team conducted feasibility analysis and testing of the preferred plan. This work prevents against any fatal project flaws that may hinder the implementation of the plan. However, there is always a need for more in-depth testing to assure the accuracy and feasibility for some of the plan elements after the Charrette.

Once the plan revisions are identified, it is advisable to hold a follow-up stakeholder meeting. This meeting ideally occurs four to six-weeks after the Charrette. This event can be a stand-alone meeting or a pair of meetings occurring one or two-days apart. The two-meeting model is especially effective for projects that remain volatile after the

Charrette or for projects with significant post-Charrette revisions.

This provides an important forum either for those who were absent from the Charrette or for those who maintain serious reservations about the state of the project. The concerns of these people are best accommodated as they are in the Charrette, through a final feedback loop. Following these community meetings, the project team works to finalize all plan revision

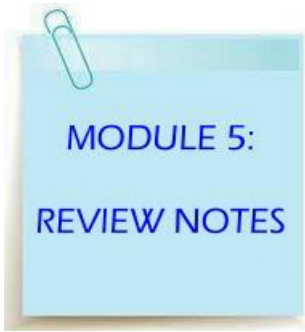
5.4 Phase 3: Plan Implementation

As presented at the final Charrette meeting, the preferred plan is a work-in-progress. During the Charrette, the team conducted feasibility analysis and testing of the preferred plan. This work prevents against any fatal project flaws that may hinder the implementation of the plan. However, there is always a need for more in-depth testing to assure the accuracy and feasibility for some of the plan elements after the Charrette. Once the plan revisions are identified it is advisable to hold a follow-up stakeholder meeting. This meeting ideally occurs four to six-weeks after the Charrette. This event can be a stand-alone meeting or a pair of meetings occurring one or two-days apart. The two-meeting model is especially effective for projects that remain volatile after the Charrette or for projects with significant post-Charrette revisions.

This provides an important forum for those who were either absent from the Charrette or for those who maintain serious reservations about the state of the project. The concerns of these people are best accommodated as they are in the Charrette, through a final feedback loop. Following these community meetings, the project team works to finalize all plan revision and complete the project drawings and documents.

5.5 Readings & Review

- 1) Lennertz and Lutzenhiser, 2014
"The Charrette Handbook"
American Planning Association



a. Have you ever experienced difficulties in fostering cooperation and collaboration between stakeholders in your current operations? If yes, in what activity?

b. Do you apply any practice/methodology in your current operations to enhance collaboration between stakeholders or cooperation depends exclusively on personality traits and leadership of the convener/s?

c. Do you find clear the NCI Charrette System™ presented in this module for future application to enhance cooperation between stakeholders in the establishment and management of industrial parks in your country location? If not, what issues are not clear?

d. For future use, do you intend to apply the NCI Charrette System™ presented in this module to enhance cooperation between stakeholders in the establishment and management of industrial parks in your country location?



MODULE 6: PLANNING THE ESTABLISHMENT OF AN INDUSTRIAL PARK

6.1 Planning an Industrial Park

One element of the industrial park development process is the planning of physical space to achieve the goals of a Sustainable Industrial Park, such as shared facilities, environmental sustainability and tenant interaction. This module considers the location factors associated with industrial parks, along with connections to infrastructure and local communities.

6.1 Introduction

Industrial areas typically fall under two categories: the first is an older industrial area within a community, “Brownfield”, while the second is a newer industrial park facility usually away from densely populated areas “Greenfield”. The older industrial areas are integrated into the fabric of the community. In many cases, the community developed around the industrial facilities and redeveloping these sites can be a complicated and lengthy endeavor.

Industrial parks, on the other hand, are areas on the fringes of a community that are designated for activities associated with industrial development, which can include materials processing, materials assembly, product manufacturing, and storage of finished products. Uses can include manufacturing facilities, warehouse distribution centers, and truck terminals.

Planning of industrial parks needs to consider development around existing industrial areas that are integrated into their community, with established linkages and ancillary services, and with the possible need for brownfield remediation due to past environmental damage.

Greenfield industrial parks, often on the urban periphery, afford advantages of space, new construction and infrastructure, and the potential of designing and building a park from scratch. Possible disadvantages include distance from existing suppliers, workers, and transportation routes, as well as the opportunity costs of using farmland or

displacing current economic activities nearby residents.

This module will address the location, planning and redevelopment issues associated with industrial parks.

6.2 Industrial Park Location Trends

Industrial mobility can be increasingly separated from geographic mobility. Some industries have specific geographic requirements: they must be physically near sources of supply, markets, and so forth. Many, however, have no such requirements. Recent trends in industrial location suggest that the decision about where to set a plant typically has more to do with wage levels, local attitudes, extent of unionization, and the preferences of management rather than strict geographic factors. At the same time, advances in electronic communication and transportation are further liberating industry from dependence on certain locations and have led to an increase in locational choices.

When assessing the locational attributes of any industrial site, there are two distinct aspects that one would look at. The first set of criteria deal with the physical locational suitability of a site. These include topography, access, location, environmental and natural features as well as site condition.

Planning of an industrial park seeks enhanced environmental and economic performance through collaboration between the business and local communities for collective ecological and socio-economic benefits greater than the sum of individual interests

The second set of criteria comes into effect when a site is deemed suitable in terms of the physical locational attributes.

This set of criteria deals with the amenities provided on site such as landscaping, design and architectural standards; use amenities such as on-site hotels, fitness and recreational facilities; convenience shopping; utility amenities such as on site water, sewer, gas,



telecommunication networks; and organizational management structure.

It is this second set of criteria that classifies an industrial, office and/or research park. A "Class A" Park would be one that has optimal amenities in place. A "Class B" Park is one that has the potential of being a Class A park with improvement to existing amenities and/or incorporating additional amenities. A "Class C" Park is a utilitarian park that serves a basic function well without indulging in "nice to have" amenities.

The same classification system would apply to office or industrial space in existing buildings. Well designed and maintained space in close proximity to desired amenities would rank higher than inexpensive space for incubator or starter industries. There is a need for different classes of space for successful economic development. Not all industry desires, or can afford, "Class A" space. A diversified economy is certainly a healthy economy.

When a company looks to locate or relocate in an area, it assesses some basic factors. The following is an explanation of the most common factors studied by relocation experts. Some of these factors have regional significance while others are more site specific.

6.3 Factors of Regional Significance

- 📍 **Attractive Market Outlook:** This includes demand and access to domestic and export markets;
- 📍 **Quality of Life:** A number of issues can be grouped under the heading of "quality of life". Most often, these would include the commuting times and distances, job opportunities for spouses, cost of living, the availability of affordable housing, a low crime rate, a good school system, presence of amenities for active and passive recreation, etc. ;
- 📍 **Tax Incentives, Financial Institutions and Programs:** Subsidies through the tax code, usually in the form of investment tax credits and accelerated depreciation allowances, provide added incentives to companies looking to relocate. Financial

assistance in the form of greater access to risk capital or venture capital in the innovation generation and retooling phases can be of great help to a small company with rapid growth potential;

- 📍 **Access to academic and/or research environments:** The proximity of training schools and universities is crucial because the current level of education as well as the opportunity for continued professional training is emerging as an important factor.

The presence of active participation from universities is increasingly important to research based industries.

6.4 Site Specific Factors

Fair Market Land and Construction Costs

Estimating costs accurately is another vital element in the site selection process. The land acquisition, or base price, is the single largest element. Other costs would include site engineering, utilities and infrastructure, construction materials and labor, maintenance costs, and taxes.

Transportation

Industrial parks should be located in close proximity to major transportation systems, including regional and interstate highway systems. There should be an efficient system of local roadways between the industrial park and the highway system. Access to other types of transportation systems, such as rail, port, and air freight, should be available, if they are characteristic of the region and in demand by the industry. Availability of mass-transit will be an important factor in developing countries.

Utilities and Infrastructure

Industrial parks districts require dependable utility systems. There should be sufficient supplies of water for domestic fire protection and for use in industrial processes. Sanitary sewer systems need to have sufficient capacity to support waste generated in the park. Adequate supplies of natural gas and electricity at competitive prices are necessary. Assuring minimal brownouts for power supply will be important in developing



countries. In most cases telecommunication services should be available.

Consideration should be given to developing regional storm-water management facilities to support the industrial park. Best management practices for storm-water quality and quantity are best developed on a district or region-wide basis, ideally based on the watershed of the area. If this approach is not available, on-site storm-water management facilities need to be provided.

Open storm-water management facilities should be allowed within perimeter buffer areas and planted areas, to preserve other land areas for industrial development.

Land Area

The land area needed for an industrial park can range from 20 acres to hundreds of acres. An area between 50 and 100 acres in size allows for flexibility for parcels, planting, and internal transportation and parking systems. Large, rectangular tracts of land that are available for development at competitive prices in the region should be considered as sites. Land should have minimal impediments to development, to make them competitive in the marketplace. Conditions such as steep topography, exposed bedrock, wetlands, sensitive environmental areas, and irregular shaped parcels can contribute to site development costs and inefficient use of the land.

Current Land Use and Compatibility with Adjacent Areas

Evaluation of the suitability of specific park sites is influenced by the nature of the current use of the land and the compatibility of the prospective park activities with those in adjoining areas. While there is an increased acceptance of mixed uses in industrial and business parks, not all activities are compatible with residential uses. The compatibility of industrial uses with adjacent uses will depend highly on the type of industry that locates in the area.

When considering an industrial park, the following are among the types of typical impacts from industrial uses.

- 📍 Transportation: Increased traffic volume and overall impacts on local and regional transportation systems;
- 📍 Community services: Increased demand for community services, including utilities, police, fire and rescue, emergency services, and medical facilities ;
- 📍 Pollution: Specifically air pollution generated from increased traffic and/or processes carried out throughout the industrial district. Can also include light pollution, water quality impacts, and noise;
- 📍 Aesthetics: Ensuring the design and operation of the district is compatible with the character of the community.

Governmental Jurisdiction Regulatory Control

Regardless of the kind of permitting process a state or local government requires, companies would like it to be predictable. Industry wants to know what to expect and prefers regulation to open-ended policy statements. Lengthy approval processes or uncoordinated permitting procedures will be detrimental. Local governments that provide "one stop shopping" or have pre-cleared industrial lands are at a distinct advantage. Another key element would be a pro-business climate. The attitudes of the State government, its regulatory agencies, local companies, community leaders and residents are usually good indicators of the business climate.

Industrial parks will need to follow local rules and regulations. Appropriate zoning is often the first step. Depending on the nature of the park, see park typology discussion on module 1, zoning can vary from heavy industrial to mixed use areas. In the case of R&D parks, special zones or Planned Unit Development (PUD) or floating zones may be created. Subdivision regulations may control building design, internal street networks and landscaping features. Other regulations could include noise, vibration and light ordinances and environmental standards for air and ground pollution.

Environmental Issues

Industrial/business sites must conform to a wide range of federally and locally mandated



restrictions designed to maintain a healthy environment. Sites with few or no environmental constraints are at a distinct advantage.

Labor Force

Development of the industrial park will be directly related to the ability to attract labor from proximate areas to the park to serve the industry within the facility. The available labor force is directly related to the type of industry that can be attracted and the likely success of the park. Among the labor force considerations to assess are:

- 📍 Location of the labor force;
- 📍 Characteristics of the labor force, skilled or unskilled;
- 📍 Relative cost of labor in the region;
- 📍 Transportation systems available to bring the labor force to the district.

6.5 Site Design Considerations

Organizational Systems

Industrial parks tend to be organized according to a grid system, to optimize flexibility in parcel shape and size. Internal street patterns also follow a grid, to accommodate heavy truck traffic. Newer industrial parks, which often include office space and require less excessive truck use, may use more curvilinear road systems that follow the natural contours of the land. Parcel sizes often vary, to capture changing market conditions. Most parcels are between 200 and 300 feet deep and allow for land to be re-subdivided to create larger lots, if desired.

Circulation and Parking

Traffic, road, and parking standards depend on the uses allowed in the industrial park. Country specific Institute of Transportation Engineers (ITE) standards should be reviewed when developing the circulation and parking system for the area. These standards include road width and bearing capacity, truck loading and turning requirements, traffic generation guidelines, and parking requirements based on type of use.

Major access points should not conflict with pedestrian movement or adjacent residential areas, and local traffic flow should not be disrupted as a result of truck movement.

Buffers and Open Space

Most industrial parks require planted buffers to separate them from residential uses. They also require sites to be planted and to retain tree cover. Modern industrial parks are often lower in density than older industrial areas; some require between 70 to 80 percent open space. Height and bulk standards, floor area ratios, and other density standards for structures should be compatible with competing industrial areas throughout the region, yet still provide for land to be set aside for buffer zones, greenbelts, and protection of environmentally sensitive areas.

Structural Elements

While utilitarian districts with inexpensive structures and minimum site improvements are often required for competitive reasons, enhanced design adds value to the industrial park, the community, the owners, and the employees. Among the elements of enhanced industrial park design are underground utilities, architecturally harmonious structures, planted areas, and road systems that allow for safe and efficient movement.

6.6 Older Industrial Regions

The revitalization of older industrial districts brings a different set of issues to the planner and developer. Older areas frequently predate zoning and buildings codes, fail to meet state of the art industrial operation standards, are intermingled with residential uses along narrow streets, and have some environmental degradation. In developing countries these usually take the form of small factories, in poorly constructed buildings, in poor neighbourhoods with limited infrastructure.

Revitalizing older industrial areas is more than finding a new use for the existing buildings. It often requires gutting and redesigning the building itself with telecommunications networks, infrastructure and utilities, bringing



the building up to current health and safety codes and reconfiguring internal space. As for the site, this will invariably require new transportation and parking networks, upgraded utilities and some amount of landscaping and buffering.

Successful revitalization depends on four basic focus areas. All four of these areas, while independent, are linked together. For successful revitalization efforts, each of these four focus areas needs to be integrated. The first deals with the industrial site and the factory building. Location, physical condition and previous use history will all play a critical role. Building characteristics would include the age and size of the factory, the ease with which it can be divided into smaller spaces, the number of floors and, the condition of heating and ventilation systems.

Past and present uses provide a quick indication of structural qualities such as load bearing capacity and the versatility of space. However more importantly, the previous uses are a good preliminary indicator for environmental contamination possibilities. New uses will typically need the subdivision of space, upgrades in utility systems and introduction of smart technologies. Structural upgrades to bring the buildings up to code will also be required. Site characteristics are equally important. Adequate circulation and parking, upgraded roads, enhanced landscapes and additional buffers are just some of the typical improvements that will be required.

Thus, the reuse or revitalization evaluation begins with the structure and site. It needs to be assessed from both a planning as well as an engineering perspective. If the building is in reasonably good shape from a structural standpoint, and environmental concerns don't appear too daunting, revitalization makes good sense from a land use perspective.

The second focus area revolves around the values of the neighborhood and its commitment to revitalization efforts. Successful revitalization efforts are anchored by effective public-private partnerships.

Revitalizing old factories is far more complicated and difficult than building a new

structure in a Greenfield site. The benefits of revitalization, however, can be immense for a community. These range from financial advantages, returning property to the tax rolls, on the one hand, to qualitative factors such as environmental clean-up, quality of life, perceptions of vitality and sometimes fulfillment of a social need on the other. It is important to analyze where the mill complex fits in terms of a community's development plan and zoning as well. The town's plan will provide a strong signal to a developer that revitalization is desired, and whether the community is willing to provide resources to help it. The attitudes of a community and commitment from the local leadership in terms of time, money and staff resources are critical. It is not uncommon for revitalization efforts to require changes in zoning and accommodations with regard to other local regulations.

Furthermore, it is virtually impossible today to revitalize an old industrial site without a public-private partnership. On the public side, this can take many forms ranging from master planning to zoning to tax breaks and tax increment financing agreements. It can also mean a governmental agency guaranteeing the long term rental of space. In a final analysis, when a community is willing to be flexible and work with the developers in insuring a mutually beneficial project, the success rate for the revitalization effort will increase dramatically.

The third focus area deals with market conditions and regional trends. Like the assessment of the mill site itself, one needs to carefully examine market factors in order to determine what uses will be sustained, and at what costs. Old factory sites may lend themselves to several reuse options including industrial, commercial, retail, educational, cultural and residential uses. Not only will the location and flexibility of the space matter, but demand for uses will play a critical role as well. A study of market absorption, vacancy rates and market saturation is in order. Reuse options will be a combination of market demand and versatility of the structure and site. An analysis of market feasibility also needs to address cost-benefit assessments for different reuse scenarios. It is quite common to find that there isn't adequate demand for a single use and the structures are best suited



to mixed-use developments. For example, retail activities on the first floor and offices on upper floors.

Regional growth strategies and policy also impact market conditions. For example, does the planning agency have a plan that promotes brownfield redevelopment? Are smart growth principles advocated with benefits for revitalization proposals? Most successful revitalization efforts are market driven and satisfy a market niche. Once this market niche is identified and we know that the structure and site lends itself to the reuse option specified, it is time to implement the process of revitalization.

The fourth area focuses on the development entity and management interests. Whether it is a private developer or a quasi-public development entity, successful revitalization depends on several factors ranging from available capital to experience and innovation. As with the community leadership, the developer or development entity should be committed to building an effective public-private partnership. They need to be flexible in their demands and have realistic expectations of the process and the project. The developer needs to understand and target the market, create a project that the community would be proud of, work in an ethical manner and be flexible in terms of process and outcome. An innovative developer who understands and respects the history of the industrial site, the larger context and the values of a community, will invariably develop a good project in keeping with local values. In turn, the developer will be able to draw on the goodwill, commitment and shared efforts from the host community.

Revitalization of older industrial areas is one of the most challenging and difficult tasks facing local planners. They will be challenged, confronted, provided with conflicting information, and faced with emotionally charged people. Planning for old industrial districts requires great sensitivity on the part of the planner. It is critical that there be maximum citizen involvement, maximum environmental protection and continuous monitoring of these areas.

Not all older industrial areas lend themselves to successful revitalization efforts, but when they do, it's well worth the effort.

6.7 Emerging Trends

Research conducted on office/ industrial/ business/ multi-use parks suggests that suburban office/industrial parks are on the decline. Millennials prefer to have walkability, access to transit stops and active environments where they work and those are increasingly found in the urban centers rather than suburban places. The Urban Land Institute (ULI) has published a handbook on Business/Industrial Parks (Frej, 2001) where it lists the main design elements that contribute to the success of a Business Park. Furthermore, the National Real Estate Investor's online platform has published the top 10 features/amenities that are sought after in a business park.

Combined, these elements are:

Flexible Master Plan

Areas should be planned in general terms so that there is allowance for adjustments of requirements and so that prospective tenants may be able to build to suit. It does not have to be all commercial use. Mixed-use development often reduces trip generation, spreads traffic flows on main roads, makes transit provision a more realistic option, and allows more people the option of living closer to their place of employment;

Attractive landscaping and public spaces

On-site retention ponds and storm-water treatment areas have become common requirements for parks. Some other sustainable features include landscaping with native plants that do not require extensive watering, and shading buildings with trees and shrubs to keep them cooler during the hot summers. Open space along the perimeter of the site enhances value.

On-site amenities and services



These are becoming increasingly critical to the success of parks and are in the Top 10 amenities for business parks listed by NREI (Piperato, 2015), i.e. any specific space for employees to unplug for a bit, whether it is a roof-top deck, a tenant lounge, café, or a patio. For example, AT&T's lab campus in New Jersey has some amenities that include office support spaces, such as open team areas, huddle rooms, conference rooms, while other amenities include cafeteria, food court, mall services, training facility, fitness center, vision center, central information resource center (Klamut, 2000).

Accessible food options also features in the Top 10 amenities in Business Parks with the thought that good quality food at reasonable prices is a big draw for business park tenants. Yet other services, if allowed, include barber shops, beauty salons, drycleaners, travel agencies, daycare centers, office supply stores, copy centers, mailing and delivery service, and the like.

Projects that have had a “wellness” intention have had considerable success recently with the push to not only provide a fun space that fosters worker creativity, but also a space that encourages employee wellness goals. Seven general wellness strategies as outlined in ULI's “Building for Wellness – The Business Case” relate to:

- Clean indoor air with non-smoking policies, ductless heating and cooling systems, green walls and the use of non-VOC materials;
- General physical activity through project design. Some features include active staircase, interconnected sidewalks and trails, car-free site, shaded/covered sidewalks, and jogging tracks;
- Support for bicycling by providing for bike lanes, bicycle stations, shops, bike-share program and bike-share facilities;
- Structured fitness activity through built amenities such as fitness/wellness centers, gardens and

trails, roof-top/open air workout space and pools;

- Structured fitness/wellness activities through programming such as classes, walking groups, seminars, runs, and walking school buses;
- Encouraging social interaction through community gardens, urban agriculture, courtyards, and block parties;
- Other intentions such as chemical-free outdoors through native vegetation and saltwater pools, natural light and LED lighting for office spaces, aging-in-place condo units, and universal design principles.

Flexible building design

Flexible building design allows for customization to tenants' needs. For example, AT&T's lab campus in New Jersey has conventionally designed office buildings planned while lab space would be added as and when needed. Allowing office space to be converted to other uses reduces development costs (Klamut, 2000).

Appropriate parking

With general trends moving from heavy industrial to specialized and high tech uses, parking requirements are changing as well. Smaller office spaces with more employees require more parking facilities. Parking tucked behind and to the sides of buildings and broken up with landscaping buffers ensures that it is not the physical and visual focal point of the site.

Performance Standards

Industrial parks are increasingly governed by performance standards. In addition to the typical setbacks, buffers, and landscape planting requirements, these standards govern light and glare, noise, vibration, air pollution, odor, heat and humidity, electric interference, radiation, outdoor storage and waste disposal, traffic, fire and explosive hazards, and toxic and hazardous materials. Consult local regulations or published



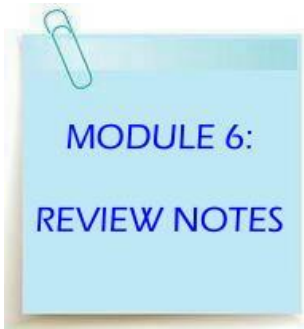
materials on industrial performance standards to develop specific standards.

Park Covenants

In addition to zoning regulations, covenants can also be used to guide industrial park development. Such covenants can describe the type and character of industry allowed within the district, general guidelines for building construction, environmental considerations, buffer zones, and overall general aesthetics. This allows potential users to be assured that their investment will be protected by similar development within the district. Covenants can also be written so that existing users within the park have input into the approval of future users locating within the park. However, like zoning regulations, park covenants should be clear and should result in a positive conclusion when all conditions are complied with.

6.8 Readings & Review

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- 6) Kotval, Zenia and John Mullin, 2011 "IBA Emscher Park: An American Perspective", in IBA Emscher Park: Impulse – National, Regional and International, by Rhista Reicher, Lars Niemann and Angela Uttke (Eds.). Klartext Verlag: Essen. pp 200-209.
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- a. Do you envisage planning an industrial park in a “Brownfield” or “Greenfield” industrial area? What is the reason behind this decision (i.e. use of old industrial buildings and environmental remediation or green industrial development and relocation of industrial areas)?

- b. Is Park planning part of a larger urban or regional planning & development in the country location? Are the responsible authorities for urban or regional planning involved in park planning?

- c. How the location has been chosen for the establishment of the park? Is the Park being planned close to suppliers, workers, and transportation infrastructure facilities and services?

- d. Are utility amenities such as on site water, sewer, gas, telecommunication networks and leisure amenities, such as on-site hotels, fitness and recreational facilities; convenience shopping, are already available or being planned in the establishment of the park?



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ODULE 7: MANAGING THE CONSTRUCTION OF AN INDUSTRIAL PARK

7. Designing and Building an Industrial Park

Once decisions have been made about location, detailed plans are needed for the design of the industrial park and decisions made about the construction of facilities given expected business tenants. This module considers the construction aspects of building an industrial park, with emphasis on the construction management process.

7.1 Introduction

This module will expose participants to core techniques and steps of construction project management including the nature of construction project management, scheduling of construction operations, calculating project cost estimates, understanding construction contracts and specifications, and techniques necessary to complete projects on time and on budget. The main categories and topics are summarized below. Various topics will be initially presented in the context of practices in the United States, but will be discussed and compared with similar practices in the developing countries.

7.2 The Construction Industry and Construction Project Management

The construction industry is an important industry globally. Effective management of construction projects leading them to their execution is a critical expertise area to ensure the success of the construction industry. This module provides a comprehensive understanding of the construction industry and the construction project management from a global perspective.

The construction industry is an important industry for almost every country in the world irrespective of their economic development status. It serves as a key indicator of economic growth as evident by the focus on this industry in rapidly developing economies of China, India, Brazil, etc. The construction industry contributes around 10% of the global gross domestic product (GDP).

It is also a major employment generator and provides employment to almost seven percent of the working population worldwide (Economy Watch 2010a).

Construction project management is defined as the process of applying project management principles in managing construction projects leading to their successful execution. In the United States, the tremendous growth in construction projects during the 1940's and 1950's led to the development of construction project management, as an independent and well-defined field. The field of business project management was well-established at that time due to its focus on the manufacturing industry. The main reason for the evolution of construction project management was due to the unique nature of every construction project as compared to the repetitive nature of manufactured products.

This module will include topics related to the overview of the construction industry and managing the construction projects. In order to expose the participants to the practice oriented details, the participants will be given details of a sample industrial park project that is ready to enter the construction phase. This sample project will be used for practical hands-on exercises for different sections of this training module. For this module, the participants will be guided through a class exercise of identifying various project participants and their roles.

The potential participants will come from various categories including: Owners/Users, Designers /Consultants, General Contractor's /Construction Manager's Organization, Subcontractors and Suppliers, Governmental/Regulatory/Inspection, and others such as, Financial, Insurance, Bonding, Historical Society, Neighborhood Groups, Special Interest Groups, etc. The following topics will be covered in this module:

- 📍 Introduction to Construction Industry
 - Current state of U.S. and global construction industry including its size and growth
- 📍 Project Management Cycle
 - Various stages of construction project management



📍 Project Life-Cycle & Participants

- Life of a project from concept to completion and various parties involved

📍 Project Planning Process

- Project management stages during preconstruction

📍 Project Controlling Process

- Project management stages during construction

- Coordination meeting among owner, designers and Contractors at the start of the project

📍 Project Manager and Resident Representative

- Roles of key personnel from the contractor on the project

📍 Quality in Construction

- Various aspects of project quality

📍 Safety in Construction

- Various aspects of site safety

7.3 Project Organization and Startup

The organization of a construction project varies greatly based on both the size of the project and the setup of the construction company responsible for its execution. After a project is awarded to the contractor and the notice to proceed is received, the initial measures and procedures that are followed have a profound effect on the success of the project. Before work begins on a new project, the first step is to devise a project start-up strategy.

The organization of a construction project varies greatly based on both the size of the project and the setup of the construction company responsible for its execution. In order to expose participants to practical aspects of project organization, they will be guided through a class exercise on identifying and outlining the responsibilities of the project manager in-charge of the construction of the sample industrial park project. The sample project scenario will be the same as the one explained in the previous module on the construction industry.

This module section will include following topics:

📍 Pre-job Planning Meeting

- Contractor's internal meeting after bidding the project

📍 Project Start Up/Mobilization/Initial Setup

- Various steps to get the project started

📍 Pre-construction Conference

7.4 Cost Estimating

Cost estimation is probably the most important function of construction project management. It establishes the project cost based on the design development. It represents a prediction of the work to be done and the cost of doing the work. The accuracy of the estimated cost depends upon the level of details available about the project. The participants will be given a practical hands-on exercise in order to understand cost estimating. They will be guided through a class exercise on developing quantity take-off of the sample industrial park project. The sample project scenario will be the same as the one explained in the Construction Industry module section.

Based on market analysis it is advisable to propose different alternatives and options of industrial park floor plans, sketches and related infrastructure development to prepare options of cost estimates for industrial park construction

This module section will include the following topics:

📍 Types of Estimates:

- Various types of estimates and their accuracy levels

📍 Conceptual / Quick estimate

- Quick estimate based on area and/or volume



- 📍 Work breakdown structure
 - Dividing a project into manageable parts to come up with estimating items
- 📍 Quantity takeoff
 - Process of measuring quantities from drawings
- 📍 Estimating development steps
 - Steps to follow to develop a complete estimate
- 📍 Crews and productivities
 - Assigning workers for various work items and calculating their output
- 📍 Direct and overhead costs

7.5 Project Scheduling

Project schedule is a key function of construction project management and it complements the information in a cost estimate. The cost estimate and project schedule are interdependent on each other because the duration of an activity directly impacts its cost and the resources selected for the corresponding work item directly impact its duration.

A project schedule is a projected timetable of construction operations. In addition to establishing project duration and milestones, a good schedule assists with aligning the resource usage over the activity durations, coordinating work among various trades, monitoring and measuring progress and planning for contingencies by providing “what-if” scenarios.

There are two main types of scheduling tools used in the construction industry. For smaller projects and for projects where limited scheduling information is desired, Bar or Gantt Charts are used. On larger projects and for projects where detailed scheduling information is desired, Critical Path Method networks are used. Participants will be given a practical hands-on exercise in order to understand project scheduling.

They will be guided through a class exercise on developing a milestone schedule in bar chart as well as in the Critical Path Method (CPM) format for the sample industrial park

project. The sample project scenario will be the same as the one explained in the first part of this section. This section will include following topics:

Work breakdown structure

- 📍 Dividing a project into manageable parts to come up with scheduling activities
 - Type of activities
- 📍 Details of various activity types
 - Critical path method and bar charts
- 📍 Types of scheduling techniques
 - Logic diagram
- 📍 Developing a scheduling sequence diagram
 - Scheduling calculations
- 📍 Calculations to identify the critical path
 - ES, EF, LS, LF and Floats
- 📍 Time attributes of activities
 - Labor loading on schedule
- 📍 Linking workers aspects of the estimate with the schedule
 - Cost loading on schedule
- 📍 Linking cost aspects of the estimate with the schedule

7.6 Construction Administration and Documentation

A typical construction project has several types of documentation that are required to be maintained. The purpose of project documentation is to record information of the project that can assist with the management of the project. Documents need to be in legal format, factual and consistent so that comparisons can be made to previous reports. In order to expose participants to practical aspects of project administration and documentation, they will be guided through a class exercise on identifying and compiling a list of documents maintained during the construction phase of the sample industrial park project. We will continue to work on the same sample project scenario.

This module section will include the following topics:



- 📍 Project Documentation
 - Various documents needed to manage a construction project
- 📍 Control Formats
 - Various formats needed to ensure that the project is completed within time and cost
- 📍 Computer applications to handle documentation
 - Computer tools available to handle vast amount of paperwork on a construction project

7.7 Contracts and Specifications

There are a number of parties involved in a construction project and all have a vested interest in the project. Additionally, there are risks involved in a construction project for all parties. Therefore, a legal contract is executed among parties. It assigns responsibilities and shares recognized risks. Construction contracts are based on the way a contractor's services are procured. In order to expose participants to practical aspects of contracts and specifications, they will be guided through a class exercise on analyzing a standard contract document relevant to the sample industrial park project.

This module section will include following topics:

- 📍 Project Delivery Systems
 - Various contractual systems of project delivery
- 📍 Prime and sub contract agreements
 - Standard contract agreements between owner and contractor, and between contractor and subcontractor
- 📍 Specifications
 - Specifications of work items and materials

7.8 Project Control/Completion Techniques

📍 Related to Time and Cost

Project controls ensure the implementation of project plans during the execution of the

project by continuous monitoring of project progress and performance against the plan, reporting of deviations from the plan, enabling management to initiate corrections, and updating the plan. The construction project management cycle is an iterative approach of applying project controls and updating the project plan. The participants will be given a practical hands-on exercise in order to understand the critical aspects of completing projects within planned time and budget. They will be guided through a class exercise on performing time and cost control exercises for the sample industrial park project.

This module section will include the following topics:

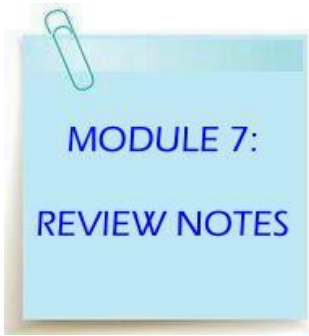
- 📍 Resource Management
 - Management of labor, material, equipment and subcontractors
- 📍 Project Time Reduction
 - No-cost and least-cost reduction of project duration
- 📍 Project Time/Progress Controls
 - Measurement and analysis of time variation
- 📍 Project Cost Controls
 - Measurement and analysis of cost variation
- 📍 Cash Flow Analysis
 - Forecasting of cash flow on a project and for a construction organization
- 📍 Project Closeout
 - Steps for substantial and absolute completion of project

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- a. Is your department/institution/organization responsible of the design, bidding, awarding, or execution of the construction of the industrial park?

- b. Would you be using internal resources to carry out the above activity/ies or would it/they be outsourced?

- c. Do you estimate that local available capacities, internal and/or outsourced, would require ad-hoc trainings in one or more steps of the construction process, as learned in this module?

- d. Following the lessons learnt in this module, could you describe the different steps to proceed from concept to execution of the construction of the industrial park in your country location? What are possible the bottlenecks that can delay or obstacle this process?



MODULE 8: POSITIONING AND MARKETING OF AN INDUSTRIAL PARK

8. Branding, Positioning and Promotion

Having established an industrial park, the ongoing management needs to position and market the park to attract and maintain tenants, as well as promoting the products made in the park and the businesses that make them.

8.1 Introduction

This module will address issues related to the branding, positioning, marketing, and promotion of industrial parks, detailing the strategic components necessary to attract tenant businesses to the parks and outlining how to develop those components.

Emphasis will be placed on:

- 📌 Understanding the recommended approaches to branding an industrial park;
- 📌 Appreciating the importance of identifying consistent key messages that align with brand;
- 📌 Learning about the components involved in creating and implementing a public relations strategy; and
- 📌 Understanding how to develop promotional resources (e.g., website, social media and events).

Branding and promotion of industrial parks is a bi-directional proposition with two distinct target audiences: potential business tenants and the community or region where the park is located. The strategies are targeted at existing business, new businesses, local governments, and other stakeholders.

The aim of the marketing initiatives outlined and recommended here is to recruit business to the region, project the business-friendly characteristics of the region both inside and outside of the locality, help retain and grow local business, maintain positive relations with funding groups, and generally raise the

awareness of economic development initiatives.

The branding and marketing tactics examined in this module include:

- 📌 Marketing materials for consistent imaging and tenant recruitment;
- 📌 Ongoing public relations strategies for internal and external communication;
- 📌 A website and supplemental content that conveys a consistent image;
- 📌 Events and award programs that highlight success and heighten regional awareness.

8.2 Branding

Establishing a strong brand identity that resonates with potential tenants and the surrounding community and region is a critical first step in building an effective marketing and promotion strategy.

Qualified businesses – or at least the seeds of qualified business ideas – are the life blood of any successful industrial park. The best programs, training and culture means nothing without a constant flow of committed business owners willing to utilize those resources and turn them into positive business growth. Industrial parks and business incubators are often mission-driven, and must communicate to multiple stakeholders simultaneously.

Here are some guidelines to follow in developing a brand strategy:

Communicate the unique value and purpose of the initiative: There is no guarantee that an industrial park’s target audiences – including business owners that are prospective tenants – will inherently understand that the underlying purpose of a given initiative is to provide specific resources that have the potential to cultivate and incubate their businesses. An effective brand should specifically define the problem solved for those businesses and outline what the prospective tenants stand to gain. For example, a given initiative might “help innovators create prototypes and develop business strategies to move those prototypes



to market”. Even more specific to business sector, another might “provide actionable strategies for businesses in the creative realm.” The language used should be familiar to the target audiences, define a unique value proposition, and specifically identify ways programs help them;

Identify and communicate competitive differentiators: An important step for any organization identifying and establishing a brand and marketing position is to determine what it is up against. For industrial parks, that might be similar initiatives in other, perhaps more desirable, parts of a community, or it might simply be other properties that are distinguished by characteristics such as lower rent or better perceived location. Whatever the competitive landscape, it’s critical for an industrial park to identify its key competitive differentiators so that those can be leveraged in developing and communicating a brand;

In a growing “glocal” competition to attract investments, technologies and new jobs, marketing is a main leverage of an industrial park to succeed and integrate itself into global production networks

Establish and practice brand consistency: Brand consistency becomes even more important in communications-related practices such as message development and outbound public relations that will be covered in subsequent sections of this module, but it’s worth noting in the context of brand development that consistency and cohesion is critical. One important step to setting and achieving brand consistency is creating of set of branding guidelines.

This can encompass everything from communications tone and naming convention (e.g., if the initiative name translates to an acronym, when is it acceptable to use only the acronym in communication) to logo usage and color scheme. Branding guidelines should be considered a working document, especially in the early stages, and subject to adaptation.

When ultimately finalized, however, the branding guidelines will be an effective tool and example for tenants that likely are in the early stages of establishing their own brands.

8.3 Messaging

Following the initial identification of brand identity, the next step in developing a marketing plan for an industrial park is messaging. Put simply, message development is the process of telling the simple story of a business, organization, or initiative, encompassing the services or products offered.

Once messaging is developed, it is put to practical use in:

- 📢 Pitches to prospective tenants;
- 📢 Presentations;
- 📢 Communications collateral;
- 📢 Advertising concepts;
- 📢 Website.

Similar to the early stages of brand development, it’s important in this phase of the marketing process to have a solid understanding of what the target audience needs to know about the initiative. To that end, there are several relatively simple recommended steps to follow to begin the process of message development:

Discovery: This step in the process involves research and information-gathering. It should include a thorough review of the business plan, interviews with key stakeholders involved in the initiative, in-depth discussions with any current or prospective tenants, an audit of available data on business development trends in the region, a competitive analysis, and a review of any external assets that may exist, such as media coverage.

Message creation: Following the discovery process, create a basic template that outlines the business park’s story, keeping to a maximum of five key points with supporting information. One potential approach to shaping key messages is to answer a series of questions succinctly:



- 🗣️ Why does this initiative matter to prospective tenants and/or the community?
- 🗣️ What business problem is it trying to solve?
- 🗣️ What is the proposed approach to solving that problem?
- 🗣️ What industries are the best targets of the industrial park's marketing outreach?
- 🗣️ What existing companies presently have branches or headquarters in the region that fit the target profiles?
- 🗣️ What are their primary motivations for site selection?
- 🗣️ How will this initiative evolve over time?
- 🗣️ Are surrounding regions successfully courting the same targets?
- 🗣️ What are the weaknesses in those regions' offerings?

Story development: Once the elements of the story have been established, the next step is to translate those messages into a concise, one-paragraph story. This story will serve as the mission statement of the industrial park, and will be leveraged in various ways as marketing collateral is created and distributed. In this stage of the process, key messages may be adapted and refined to ensure that the voice fits with the brand identity established earlier. This helps stakeholders understand the context and what a message might actually look like in use, and helps refine the story.

8.4 Public Relations

Public relations (PR) campaigns build a positive reputation for a community over time. Effective public relations serve to boost an industrial park's reputation as business- and community-friendly in the long term. Good PR will get the attention of prospective tenants, as well as educate the local population on the industrial park's mission and how its presence can contribute to economic development. Public relations is one of the most underutilized – and most effective – forms of marketing. It is also relatively inexpensive when compared to traditional advertising. Prospective tenants

and members of the community consume local media coverage via websites, newspapers, newsletters and TV news. Stories on the successes of local business initiatives will help with business retention. Frequent local publicity is critical to gaining local awareness and support.

Public relation strategies typically include the following tactics:

Press releases: A press release is an easy-to-write, clear and short news story, written in the third person that seeks to demonstrate to an editor or reporter the newsworthiness of a particular event. The components of a press release include:

- 🗣️ **Headline** (it will catch the attention of an editor or reporter);
- 🗣️ **Dateline** (Place, Date) ;
- 🗣️ **Introduction** to the topic;
- 🗣️ **A quote** from a park's principal or local/regional representative;
- 🗣️ **Conclusion**;
- 🗣️ **Contact information.**

An industrial park should aim to distribute at least one press release, one page or less, at least every six to eight weeks to local, regional, and statewide media. This content would include any economic development-related information that helps advance the image the initiative. Topics could include relocation and expansion announcements, development news, tourism news, new tenants, new municipal initiatives related to helping support local business, etc. Some may be for local education and consumption only. These releases should be written to have news value, not as advertisements. A database of local, regional, and statewide media should be developed. Press releases should be distributed directly to media via e-mail and, if budget allows, via an electronic distribution service. Press releases should also be posted on the industrial park's own website and distributed via social media outlets.

Thought leadership articles: Many editorial outlets will accept articles on various subjects



written by experts. The director of an industrial park initiative could pitch contributed articles on local and regional business development to local, regional, and statewide media outlets. Contributing expertise in the form of content is a proven tactic for brand-building and promotion. Articles should be non-promotional, informative, and instructional. The best contributed articles – and those most likely to be accepted – are those based on expertise and experience that share valuable knowledge with the reader. Links to these articles should be posted on the industrial park’s own website and distributed via social media outlets.

Face-to-face media interaction: An industrial park’s principals should build relationships with local, regional, and statewide media representatives by scheduling regularly meetings. This builds a foundation for both getting out the good word and dealing with negative news, in the event the latter becomes necessary.

Annual report: The report can be distributed locally, online, and to local and regional government agencies. The report also should be posted on the industrial park’s own website and distributed via social media outlets.

8.5 Promotional Resources

Within the last 15 to 20 years, there has been a global shift from traditional marketing material, i.e. print-based media) towards marketing materials and information that can be accessed electronically. The internet is now a centralized and primary source for virtually all information. As such, a primary component of an industrial park’s marketing and branding strategy is its website – the first point of contact for most prospective tenants and other audiences.

Website: An industrial park’s website should be professionally designed and can be comprised of multiple components, including:

- 📍 A navigation bar at the top of the site that pop-up or dropdown menus for major information headings. Those headings should include, at minimum, categories that provide basic but thorough information about the initiative, community and regional information, a

listing of tenants with links to their own websites, location information, contact information, and published content (press releases, links to thought leadership articles, etc.).

- 📍 A location map of the industrial park in proximity to the surrounding area. The map should identify highways and roads. In addition, the map needs to be functional and allow site visitors to zoom in and out of the industrial park area;
- 📍 Information about infrastructure and servicing, such as electricity, water and wastewater services, and storm water retention;
- 📍 Competitive advantages that make the industrial park (see Messaging section 8.3);
- 📍 Downloadable and printable informational data sheets (or “email a pdf site sheet” calls to action);
- 📍 A page for news with a brief summary of current stories, along with links to relevant third-party reports and other information;
- 📍 A downloadable and printable prospectus (see Promotional Resources section 8.5);
- 📍 Tenant testimonials;
- 📍 Photography of the region;
- 📍 Partner links.

All website data and content should be regularly updated. A website’s layout should be simple, language should be direct and informative, and the site should be easy to navigate. Industrial park information should be easy to find using a Google search, which means websites should be optimized for search engines. This is a function most website developers can either provide or recommend.

Content: Equally important is the content that comprises the website, as well as every other promotional and marketing resource developed and leveraged by an industrial park. Relevant, meaningful, authentic content is a core component of marketing. It is paramount to attracting tenants, as well as garnering local/regional support and media interest and coverage. Content can be leveraged to share new ideas, reinforce



learning, promote valuable programs, and encourage connections within the community. Content components can include:

- 📍 Articles, original and repurposed;
- 📍 Blog posts;
- 📍 Infographics;
- 📍 Position pieces.

By thoughtfully creating, curating, and sharing content across a variety of electronic platforms, an industrial park can enhance its visibility and perceptions in the community and in the media.

Prospectus: The purpose of a prospectus is to provide interested parties who wish to print information with a quick way to download relevant information in one document. A prospectus is a standard document that realtors, site selection professionals, and business owners can easily review. This prospectus must be designed in a printer-ready format and made available online. It should include:

- 📍 Business park promotional information that highlights key messages;
- 📍 Zoning, servicing, and other relevant information;
- 📍 A local/regional profile containing detailed community information;
- 📍 Sector-specific information with one or two tenant success stories.

Social Media: Industrial parks should create and implement a simple but frequent social media strategy across multiple channels (Twitter, LinkedIn, Facebook, Instagram) and leverage the outlets as avenues for distribution of content and intelligence, as well as mechanisms for releasing timely information, e.g. press releases.

E-Newsletters: Developing a contact list through a subscription-based regular email message, at least monthly if not twice per month or even more frequently, is highly valuable because it builds a network of contacts and communicates with them directly. A subscription list allows industrial park managers to track contacts, stay current in the minds of target audiences, and invite individual communications that can turn into

potential tenants and other contacts. E-newsletters should contain:

- 📍 A graphic banner;
- 📍 A compelling subject line;
- 📍 A brief welcome message;
- 📍 Images (photography);
- 📍 One-paragraph summaries of news articles with links to the news page of the organization's website.

Events: Another opportunity to build awareness and generate media attention when promoting an industrial park is to hold regular events. This effort should commence with a launch event that can be used as a celebration of the official grand opening of the park. People involved in creating and managing the park can speak about opportunities for businesses, and tenant or prospective tenant businesses also can be invited to speak. Over time, the event can become an annual, or even more frequent, event at which business leaders gather to network with one another and celebrate the recent accomplishments of innovators and entrepreneurs in the community. Events of this type can comprise keynote addresses, award presentations, and are likely to become popular networking opportunities for local businesses.

Awards: Established industrial and business parks should consider creating and sponsoring an annual "Innovator of the Year"-type award to be presented to a local business owner. Over time, the coveted and much-anticipated award can become an annual highlight of an event, and recipients will publicize the award on their own websites and via social media outlets.

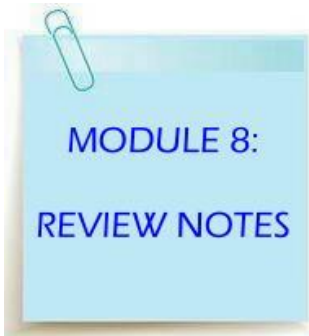
Photography: Websites, press releases and other promotional materials are much more effective if they include professional-quality photos. A set of professional photos that depict scenes in the community and reinforce key messages is an important investment. Photos with people in them have more character and appeal. Spokespeople should be recruited to participate in photo shoots, or models should be used to add interest. When photos are taken, a photographer should be equipped with release forms to ensure that



the rights of those who are photographed are respected, and that names and titles are recorded correctly.

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- a. Outline the core brand components of an industrial park initiative (real or fictional, as determined by the instructor), identifying unique value and purpose, competitive differentiators, and branding guidelines:

- b. Write three to five key messages for an industrial park initiative (real or fictional, as determined by the instructor). Create a sample story that contains each message, and list key phrases relevant to each message:

- c. Outline the components of a public relations strategic plan for an industrial park initiative (real or fictional, as determined by the instructor) that includes one sample press release and a schedule for media engagement:

- d. Outline the components of a marketing plan for an industrial park initiative (real or fictional, as determined by the instructor) that includes strategies for website development, content creation, social media distribution, and live events:



MODULE 9: MANAGEMENT GUIDANCE OF INDUSTRIAL PARK OPERATIONS

9. Management Practices for Sustainability of Industrial Parks

This module will introduce management practices to operate an industrial park and guidance on daily procedures structured on the basis of sustainability criteria. Due to the specificity of park objective/s as well as local context and complexity of its operations, detailed management of park services cannot be fully described within the context of this course. The scope of this module is primarily to provide guidance on practical basic elements necessary for the successful start of functioning and operations of parks, following common experiences in the management of industrial parks both in developed and developing countries.

9.1 Legal Incorporation

The legal incorporation of the industrial park will determine the type of entity, reflecting the members supporting it and to which the Management Team will be responsible. In general, the suitable legal incorporation will vary according to local commercial laws and attention should be paid to decisions regarding limited or unlimited responsibility of share-holders or members, the possibility of involving profit and non-profit organizations, for example through an association as opposed to a company, profit aims for venture capital activity, special status required by national and international or banking funds and loans, the legal conditions of real estate operations, etc.

A comprehensive legal study must be conducted in the country of park establishment in order to evolve a legal structure, which will facilitate the work of park promoters, park activities, and tenants' development. The legal structure should reflect a broad range of interests and in particular those of the park's financial backers.

As required by the selected type of legal incorporation, the Board of Directors or Steering Committee will consider

representatives from both the public and private sectors, local and foreign partners. This should be completed at an early stage in the implementation phase.

Industrial Parks can be incorporated as profit entities when intend to take an ownership stake in park tenants. This approach is mostly used when large cash flows are expected from rent or lease of land and industrial sheds, provision of highly specialized services as well as buyouts of tenants.

Alternatively, considering that industrial parks have often a social mission, they can be usually established as "non-profit" entities incorporated through public private partnerships with local and foreign partners, as required. Non-profit incorporation is an example of the matching of goals and means, such as facilitating the raising of funds from municipalities, chambers of commerce and universities, nationals and international donors, etc.

9.2 Setting-Up the Organizational Structure

An industrial park must be managed in accordance with the principles governing a private company and, to ensure its sustainability, it must have complete independence in its administrative, financial and accounting management.

The Management is directly responsible to a Board of Directors or Steering Committee and its set-up objective/s, planning and budget of the industrial park.

The Board of Directors or Steering Committee has essentially a guiding and supervising role.

Public ownership of an industrial park is not incompatible in principle with the idea of managing these facilities in a sustainable manner.

However to achieve this, an operational framework needs to be created that maximizes the incentives for management to run the facility in an efficient and effective way. In this way, the industrial park takes into account and responds to the targets sets on it as a result of its socio-economic role, as well as the demand related to the return on



investment, as a result of the use of private funds and public subsidies.

Management for sustainability of the industrial park suggests that the ownership be separated from its management

In order for the Steering Committee to fulfill its role effectively, it should have a manageable number of members, possibly up to nine, to facilitate decision-making.

The organizational structure of the industrial park may include an Advisory Board or Committee. This has the function of assisting both the Steering Committee and the Management team in decision-taking on planning and operations of industrial parks, for example by advising on admissions of tenants, on park strategic directions, providing advice on product development etc. The business plan should indicate the source of membership of the Advisory Committee, for example representatives of local or foreign companies, individual experts in specific fields of interest for the park, representatives of industrial parks and related networks, development agencies and research institutes, banks and financial institutions, business associations and chambers of commerce, etc., whenever not involved already in the Steering Committee.

The Advisory Board or Committee is composed for the most part of organizations and institutions which externally play a promotional and linkage role in the area, and internally provide advice in general policies to the Steering Committee.

The industrial park's levels of staffing will depend on the number of tenants and the type of facilities and services provided. The business plan will define the composition of the Management Team and the number of support staff needed to launch the industrial park, together with projections regarding the likely increase in staffing over the period of the plan. Let's recall that usually a park is established in phases, and staffing should increase according to planned expansion phases.

The staffing of an industrial park can vary greatly depending on its size and needs. Typically, an industrial park will have a management staff/tenant ratio varying from 1:5 to 1:10, according to specialization requirements of the park. The Management Team is likely to consist of a chief executive supported by executives with specific responsibilities for finance and administration, and the various services provided to tenants, in particular advisory and training services.

9.3 Selection and Training Requirements of the Management Team

An industrial park needs to be managed as an enterprise, not as a public service, responding as required to financial sustainability and socio-environmental targets. Ideally the Management Team should be recruited from the business sector, and not the public service sector, as the exposure to the private sector experience is critical to manage daily operations of the park.

The success of industrial parks in developing economies, as in other regions, will ultimately depend on the quality of the Management Team appointed to operate them.



Personal qualities are clearly critical and the person chosen to lead the Management Team needs to possess entrepreneurial skills and a flair for leadership, organization and management skills.

It is also recommended that the Manager is capable of gaining the confidence of the local community and



CEOs of companies, financiers, political authorities, personnel, etc., in the Region. The Manager must be also capable of providing tenant companies with professional contacts on a regional, national and international level.

The Management Team should be contracted to operate the industrial park for a limited period of time and given measurable objectives against which their performance can be subsequently monitored and evaluated.

Incentives should be offered to managers so that outstanding performance is encouraged and duly rewarded.

Training is also important and in this respect it is suggested that prospective industrial park managers in developing countries are seconded to parks in countries with experienced management to gain first-hand knowledge of how they operate.

Staff to support the manager of the industrial park will also need to be recruited and trained. An option with regard to training is to arrange for a secondment of the key staff to a successful industrial park or to organize on-the-job trainings in site by teams of foreign industrial park management staff.

All trainings should be aligned to the work program aiming to establish the industrial park. More particularly, whilst the time needed to complete the planning stages can be usually estimated fairly precisely, there can be long delays in proceeding to implementation of the business plan, caused usually by complications with regard to raising funds. Accordingly, the implementation phase itself can be protracted.

Usual risks experienced in organizing trainings to prospective industrial park management teams, are related to targeting local staff, who for delays in the park implementation program, either are not yet recruited for the scope, either are changing responsibility/position, if seconded from other institutions, or thanks to the newly acquired skills are moving to other jobs, before the industrial park's operations are started.

9.4. Setting and Managing the Support Network

Experience in prior UNIDO assistance on industrial parks to developing countries suggests that a support experts' team combining foreign and local expertise is best placed to implement the operational program of the industrial park.

Industrial parks promoters in developing economies are likely to need technical assistance from abroad for some time to come during the start-up phase of the industrial park. This should not, however, lead to overdependence on external assistance, and steps should be taken to ensure that a transfer of know-how takes place and, at least Regional knowledge is developed for mutual assistance between countries in the developing world.

The role of foreign experts should be to:

- 🗨️ Assist the preparation of the terms of reference for the operational work program, including a detailed specification of the tasks to be undertaken by the staff and various consultancy team members;
- 🗨️ Provide advice with regard to promotional activities aimed at building up local support for the industrial park;
- 🗨️ Assist on methodological issues, including the design of marketing questionnaires and sampling frames for the fieldwork, market testing methods, questionnaires for admission procedures, etc.;
- 🗨️ Assist the preparation of financial planning;
- 🗨️ Coordinate the preparation of reports and ensure quality assurance;
- 🗨️ Define an evaluation framework for the industrial park to help monitor its performance against planned targets once it is operational;
- 🗨️ Provide advice on practical issues relating to day-to-day industrial park operations;



The extent of foreign technical support that is needed will depend on the capabilities of the local staff appointed to the industrial park.

Local staff should be able to:

- 📍 Update information needed to help draw up financial planning, for example the rent/lease levels that could be charged given prevailing market rates for business premises;
- 📍 Conduct the survey work and interview program needed to determine the likely level of demand in quantity and quality for industrial park services;
- 📍 Identify the sources of expertise in the area to undertake specialized support to tenants and industrial park management, as required by economic development priorities and sector specialization of the industrial park;
- 📍 Help promote the industrial park and identify potential sponsors;
- 📍 Identify candidates for tenancy and assist in assessing compatibility with admission criteria in accordance with the Steering Committee objectives, business plan, location, infrastructure, and operational strategies.

Once the industrial park is set up, local experts may be engaged in helping support specialized activities and services and advise in the assessment of technical results to insure consistency with the industrial park strategy and policies. They may also be incorporated into the Advisory Committee.

9.5. Financial Management for Park Sustainability

Industrial parks should follow a financial sustainability approach in implementing their operations, to ensure that operating costs are covered by income. Industrial parks that occupy attractive “Greenfield” premises are able to charge above market lease and rents, as well as specialized services, which gives them a far better chance of reaching an early breakeven point.

Calculations of financial estimates are one of the key components in planning and operating an industrial park.

The capital expenditure required to establish the industrial park will be largely determined by the type of premises chosen for it. Opting for a “Greenfield” purpose built industrial park is likely to be more expensive than refurbishing existing “Brownfield” premises for its use. The main category of capital expenditure, other than the cost of acquiring premises, will be equipment.

Financial estimates should be provided for:

- 📍 Capital investment required to establish the industrial park, and sources of funding;
- 📍 Feasibility studies and business plans;
- 📍 Engineering studies and technical specifications;
- 📍 Construction of the building;
- 📍 Official launch and publicity;
- 📍 Promotion;
- 📍 Selection of tenants;
- 📍 Cash flow forecasts based on estimated operating income and expenditure.

To prepare the cash flow forecasts for the industrial park, estimates should be made with regard to operating expenditures and incomes.

Typical common expenditures items to most industrial parks include:

- 📍 The salaries and wages of the industrial park staff;
- 📍 The cost of providing common services that are not incurred directly by tenants, for example the operation and maintenance of office equipment, cleaning of premises, telecommunications charges, gardening, security etc.;
- 📍 The charges for utilities, namely electricity, water, fuel, waste treatment, and maintenance charges etc.;
- 📍 Other overhead costs, such as general upkeep of the industrial park's premises, insurance and contingency items;

A major expenditure item that may need to be taken into account in financial planning is the cost of servicing loans. The extent of such borrowings will, however, largely depend on how the capital investment required to



establish the industrial park is raised and this may be in the form of grants and donations in which case no interest charges will be incurred.

With regard to operating incomes, estimates should be provided for rent/lease that will be received from industrial park units and charges for common services and utilities. Lease and rental income from tenants is generally the most recurrent source of income for an industrial park, typically accounting for 40-60% of all revenues.

Experience shows that subsidized rates create unhealthy tenants. It is better to support tenants investing in their venture through an investment fund and ask market prices for facilities and services. Possible financial support from the government should be used to add value to the park, or to support projects, not to subsidize the rent.

Fundamental to the industrial park concept is the notion that the relationship between the Management Team and its clients should not be that of a landlord and tenant. In this respect, being able to generate income from diverse sources, and in particular from advisory services, is an indication of success in fulfilling the broader and more comprehensive role prescribed by the model.

Other sources of income generation that might be taken into account in the cash flow forecasts include:

- 📍 Organization of events and seminars, commercialization services, reward fees, reference fees for external service providers;
- 📍 Royalties enabling the industrial park to obtain a percentage of the sales income from its tenants. Where such schemes have been operated, it is usually on a sliding scale basis with the royalty gradually increasing over time;
- 📍 Charges for the provision of outreach services to businesses not necessarily located in the industrial park. These services might, for example, include the provision of specialized counseling, technology brokerage, training courses, and the hire of common equipment and laboratories;

- 📍 Returns from venture capital funds are unlikely to constitute a significant source of income in the short term, but a number of industrial parks have succeeded in generating fee income by helping to manage seed and venture capital funds, and in some cases have been able to obtain considerable returns on direct investments made in their own name.

Forecasts regarding income and expenditure will depend on a number of basic assumptions, in particular with regard to the utilization of industrial park space and common services.

Assumptions that need to be made include:

- 📍 The maximum number of tenants that can be accommodated in the industrial park units and whether or not tenants will be ultimately offered a rent/lease incentive;
- 📍 Occupancy rates which, in turn, will depend on the level of demand for industrial park land or sheds and how strictly the admission and exit criteria are applied;
- 📍 Business failure rates which, unless kept at a minimum, could have a significant effect on rent/lease income and cash flow;
- 📍 The level of charges that will be levied by the industrial park for common facilities and services, and the extent to which these are likely to be recovered from tenants.

Whether or not industrial parks in the region should charge for the facilities and services they provide over and above the rent for industrial park units is a decision that will be largely determined by the level of available support from the public authorities and international agencies. In principle, some form of incentive for the provision of services can be suggested, however small and decreasing with time, so that tenants are slightly encouraged to benefit of services to improve the performance of their companies. Free of charge provision should be avoided, as services will not be usually appreciated and will be over-subscribed.

The cash flow forecast for the industrial park should be subjected to a sensitivity analysis



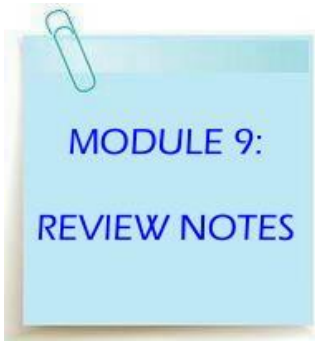
by varying these key assumptions to test for best and worst case scenarios.

There are a number of possible approaches to financial modeling for industrial parks.

In prior development assistance, UNIDO software applications such as Computer Model for Feasibility Analysis and Reporting (COMFAR) have been applied for the preparation of balances and cash-flow projections related to the establishment and operation of industrial parks.

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- a. Could you name the promoters and/or sponsors, who are or will be involved in the legal incorporation of the industrial park (local authorities, technical institutions, universities, non-profit organizations, chambers of commerce, financial Institutions, business associations, etc.)?

- b. According to the above-proposed members of the industrial park and the current legislation in your country, do you envisage to set-up a profit or non-profit entity to manage the industrial park? What are the reasons behind this decision?

- c. Please describe where the management team of the industrial park will be recruited from

- d. In how many years do you expect that the industrial park will become sustainable, i.e. fixed and variable costs will be covered by estimated incomes?



MODULE 10: PROMOTING INNOVATION THROUGH AN INDUSTRIAL PARK

10. Innovation, Technology Transfer and Commercialization

One function of industrial parks is to serve as a portal for local businesses to access new ideas, processes and products. Innovation can draw on local talent, work through the international linkages of the industrial park, or translate university research into products. This module considers the ways that universities and research centers can work with industrial parks to promote new or better products.

10.1 Introduction

Innovation and technology transfer can be an important operational and policy feature of industrial parks because they can serve as a portal between a country or region and wider economic and industrial practice. This section will discuss a number of factors associated with industrial parks and innovation.

First, the application of technology transfer principles:

- 🔊 To explain how universities develop new companies;
- 🔊 To determine if technologies have potential in the market place as a new company; as a licensed product/feature for an existing company; or no market viability.

Next, the analysis of a model for setting up the ideal startup company based on an intellectual property and how to use business concepts to determine how a company gets from startup to full scale operations.

The third section considers how startup firms expand and overcome growth hurdles, and how parks can use business incubators for scaling business and achieving more probable success. The concluding module section develops an understanding of the role of technology transfer initiatives as a catalyst for developing innovation districts.

This module section will delve into Licensing, Technology Commercialization Strategies, New Business Creation, Product Development and Production, Business Incubation, and Business Expansion.

Based on the learning objectives stated above, this half/one day module will expose participants to core techniques and steps of construction project management. The main categories and topics are summarized below. Various topics will be initially presented in the context of practices in the USA, but will be discussed and compared with similar practices in the developing countries. In addition, examples and case studies from USA and developing countries will be used, where appropriate.

10.2 The Innovation Process

In this module section, we learn how to transfer knowledge and intellectual property into commercially-viable products and processes that are attractive to industry, federal government, and investors. Learn how to communicate technology's commercial potential for future grant applications and funding opportunities, and quickly acquire business tools, savvy, and vernacular – valuable for grant applications, licensing, and company creation. The overall purpose of this program is to move technologies forward that address poorly met market needs and demands into viable commercial applications.

This section will include the following topics:

- 🔊 Ideation and Discovery
- 🔊 Disclosure
- 🔊 Intellectual Property Determination
- 🔊 Translational Research
- 🔊 Licensing vs. Commercialization

10.3 Technology Transfer

Governmental, academic, and institutional entities will often find that the sponsored, applied, and basic research being conducted will yield a new technology of some kind. The technology can reflect a process, a method, skill, product, or sampling.



These newly discovered technologies and the process by which they are discovered is considered technology transfer. However, in developing regions, discovery is led by necessity.

If enough of these discoveries occur, multiple businesses form around that specific research, and soon specialized buildings and resources are needed. Industrial Parks, Innovation Districts, Research Parks, etc. are all designed around the basic element of unique resources for unique companies, based off of some unique research or competitive local advantage.

This section will include following topics:

- 💡 Technology Transfer Basics
 - Various types of estimates and their accuracy levels
- 💡 Barriers to Technology Transfer
 - Those that discover do not always make good business people
- 💡 The Social Value to Technology Transfer
 - Do well by doing good
- 💡 Quantifying the Value
 - What is the technology worth?

10.4 Commercialization

In certain cases, technology discoveries have commercial merit. In few cases the commercialization feasibility is open and obvious. However, in majority of the situations, the technology needs to be filtered and vetted by industry experts to determine the target market fit.

In this module section, participants will be looking at available technologies, applying filters to those technologies, and determining the commercialization strategy for those technologies. Participants will also evaluate case studies that illustrate successful and unsuccessful outcomes of commercialization to better determine the cause of unsuccessful market strategies.

This module section will include the following topics:

- 💡 Ideation and idea filtering
 - Gathering ideas, and Garnering Ideas (Brainstorming Solutions to Problems)
- 💡 Translational Research
 - How to pick winners from the stack
- 💡 Roadblocks to commercialization
 - What gets in the way
- 💡 Determining Target Market Size and Market Fit
 - How large/narrow and how specific is the market?
- 💡 Utilizing Focus Groups to Determine Outcomes
 - Time to test the sample size to find first customer

10.5 Business Incubators

In this module section, the participants will learn about building the innovation ecosystem and the use of business incubators, as tools for the business development process. Typically, business incubators have a focus that fits the unique economic characteristics of the market they are in. For example, a market with a strong concentration of rice fields may have a business incubator that is focused on commercializing technologies with rice involved in the product or service.

Business Incubators provide space and resources to start-up businesses, helping them to grow and prosper during their first three years, when statistically, businesses are most vulnerable and prone to failure.

The primary purpose of a low-rent shared office space is to cut down on the overhead costs of a small company, allowing early entrepreneurs to invest more of their money into their business. A few amenities that are often included are access to secretarial services, conference rooms, printing and faxing services, a business mailing address, business support services, and subsidized rent.

Businesses typically pay rent, and are given a fixed timeline for occupancy to “graduate” from the program. During their time in the



program, entrepreneurs/businesses formally set goals and objectives and meet regularly with program administrators to evaluate their overall business development. Entrepreneurs are typically required to create a business plan and show continued efforts to meet milestones within the plan. At the time of graduation, business tenants are encouraged to expand their business in the local region.

This module section will include the following topics:

- 📍 Introduction to Business Incubators
 - Business Incubation Basics and Various Types of Programs
- 📍 Trends in Business Incubation
 - Current state of U.S. and global statistics for business incubation
- 📍 Success stories from Incubators and Incubator Companies
 - Example operations from existing business incubators
 - Example companies that are growing successfully
- 📍 International Business Incubation
 - Example incubators from around the world
- 📍 Private vs. Public vs. University/College Incubators

10.6 Innovation Districts

In this module session, the participants will learn the innovation districts and their role in the innovation ecosystem. Innovation districts are a relatively new term given to clusters of land that include elements of higher education, technology, transit, retail, housing, events, and entrepreneurship. Many of these elements are found in Business Parks as well, however the Innovation District incorporates these elements more effectively in the urban fabric. While business parks tend to focus heavily on the businesses and the technologies specifically, the innovation district focuses on satisfying the talent and the knowledgeable individual needs and wants.

This module section will focus on trends in the development industry, where the

innovation district is different from a traditional business or industrial park, and examples of successful implementations in the United States.

This module section will include the following topics:

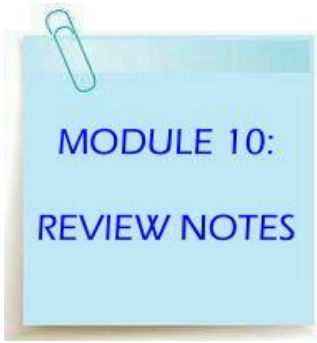
- 📍 Assets of the Innovation District
 - What key elements to include in the design of an Innovation District
- 📍 Innovation Drivers
 - Are the people or the places more important
- 📍 Innovations Cultivators
 - Champions and key personnel for successful innovation districts
- 📍 Community Building Amenities
 - Beyond bricks and mortar, events and “third places”

10.7 Readings & Review

- 1) Phyllis L. Speser, 2006
“The Art and Science of Technology Transfer,
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- 2) Samantha R. Bradley and Christopher S. Hayter, 2013
“Models and Methods of University Technology Transfer”
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- 3) Alexander Osterwalder and Yves Pigneur, 2010
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- 4) Steve Blank and Bob Dorf,
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- 5) Geoffrey A. Moore, 2014
"Crossing the Chasm"
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- 6) Clayton M. Christensen, 2011
"The Innovator's Dilemma"
http://www.amazon.com/The-Innovators-Dilemma-Revolutionary-Business/dp/0062060244/ref=pd_bxgy_14_img_2?ie=UTF8&refRID=1C07WHT0H6TOKT24ZFJB
- 7) Clayton M. Christensen, 2013
"The Innovator's Solution: Creating and Sustaining Successful Growth"
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- 8) Enrico Moretti, 2012
"The New Geography of Jobs"
<https://www.amazon.com/dp/B008035H0Q/ref=dp-kindle-redirect?encoding=UTF8&btkr=1>
- 9) Bruce Katz and Julie Wagner, 2014
"The Rise of Innovation Districts"
<http://www.brookings.edu/about/programs/metro/innovation-districts>



a. Investigate and communicate the commercial potential of a publically available technology

b. Leverage local natural resources to produce new commercial technology

c. Technology Commercialization Case Study

d. Identify up to 10 unique business incubators and detail their program approach

e. Develop a model for expanding existing resources to create an innovation district in your community



MODULE 11: ENHANCING THE SUSTAINABILITY OF AN INDUSTRIAL PARK

11. Green Construction and Sustainability

Industrial parks often aim to promote sustainable production and practices, but environmentally sound approaches can be also used in the site development and construction process. This module examines green construction, “Leadership in Energy and Environmental Design (LEED)” guidelines for construction, the most widely used green building certification program in the world, and related standards applicable to industrial parks in developing countries.

11.1 Introduction

This module addresses sustainable development of industrial parks in developing countries. Key parameters for developing modern facilities and projects today include consideration of impact on environment, energy use, health impact on occupants and overall sustainability of such developments in addition to economic, business and technical concerns. This module will focus on sustainable development practices and examples, which can be employed on development projects.

This module will address several elements of green construction with goals to:

- 🗨️ Foster an understanding among participants of sustainability principles and standards, which are being applied to projects throughout the world;
- 🗨️ Present the background on the United States Green Building Council (USGBC) LEED system;
- 🗨️ Present details of specific LEED Credits and Prerequisites; and
- 🗨️ Foster discussion on opportunities and barriers for use of LEED concepts to sustainable industrial park development in developing nations.

11.2 Sustainability Context

“Sustainable construction poses certain challenges to developing and developed

countries alike. Often, the only differences lies in the approach to finding solutions to these challenges that are appropriate to the specific contextual conditions, and the resources that are available to pursue these solutions. However, while these challenges are the main focus of sustainable construction in developed countries, in developing countries they merely constitute another layer in an already complex problem. Furthermore, while developed countries have made some progress in addressing the challenges of sustainable construction, developing countries are only now beginning to consider how to address these challenges from within the broader developmental challenges they are facing.”⁶

While the Agenda 21 for Sustainable Construction in Developing Countries (2012) addresses the many challenges of implementing sustainability into projects in developing countries including contextual conditions, economic factors, political, social and cultural factors and technology gaps, there are a number of examples of successful projects.

The United Nations Environment Programme (UNEP) Green Economy Document⁷ highlights a range of successful sustainability projects including renewable energy, solar energy, sustainable urban planning, infrastructure and agricultural projects in developing countries.

UNIDO also highlights a number of successful completed sustainability oriented projects⁸.

11.3 Sustainability Standards

Many organizations and individuals have defined sustainability and most involve some aspect of reducing negative impacts of endeavors for the purpose of ensuring the continued existence of an inhabitable planet.

Achieving this broad goal should be the objective of every project, but that is not always the case. Many individual or collective project development design and construction

⁶ Agenda 21 for Sustainable Construction in Developing Countries (2012)

⁷ Ref: Readings & Review Section n. 5

⁸ Ref: Readings & Review Section n. 6



decisions either work toward or against this broad goal of sustainability.

Knowing and assessing whether a particular design and construction decision will support sustainability requires insight, knowledge, research, setting performance objectives and assessment. Beradi lays out the importance of standards systems in being able to define sustainability objectives and assessing achievement (Beradi 2012). Furthermore, he compares several international standards and assessment systems used for sustainable design and construction projects throughout the world.

Building Research Establishment Environmental Assessment Method (BREEAM), Comprehensive Assessment System for Built Environment Efficiency (CASBEE) and LEED are several examples of standards systems used to assess environmental aspects of projects.

For this training module the focus will be on LEED, but there are similarities and benefits of each of the assessment systems. LEED may currently have the broadest international use and therefore is used as the platform for this educational module.

11.4 United States Green Building Council LEED System

The United States Green Building Council (USGBC) has developed and maintains a system of standards referred to as LEED Standards (Leadership in Energy and Environmental Design), which are accepted as international standards for use with sustainable building projects.

First formed in 1993 USGBC rolled out its first LEED standard in 2000, which addressed new construction and major renovations.⁹ Since that time a number of new standards have been developed, which address specific building types such as LEED for Schools, LEED for homes, Building Operations and Maintenance, Neighborhood Development and a number of others. Today there are twenty three standards sets or guidance documents available.¹⁰

LEED standards undergo continuous updating through proposals by USGBC scientific committees, which are voted on by its membership. Standards are updated as new sustainability concepts and new technologies are identified. LEED standards are closely tied to cutting edge sustainability standards of a number of external organizations and adopt those external standards as part of its credits system. Consequently, LEED standards change frequently and “pull” and “lead” design and construction to increasingly sustainable projects.

LEED has had a significant impact on design and construction of sustainable projects throughout the world. Today there are projects in over 150 countries and over 69,000 projects worldwide are either registered or certified¹¹.

USGBC hosts an international roundtable of twelve countries, which advises USGBC on issues relevant to the international context. The roundtable includes Green Building Councils from Jordan, Sweden, United Arab Emirates, Columbia, Peru, Romania, Turkey, India, Brazil, Argentina, Italy and Canada¹². Additionally, Canada, India and Italy have country specific LEED standards developed under the oversight of USGBC.

The LEED credit systems consist of voluntary sets of credits and prerequisites, which project teams adopt. Requirements for each credit and prerequisite are clearly laid out, and each credit has supporting discussion of its sustainability and environmental objectives and benefits as well as reference standards and documentation requirements. Once a credit has been selected, the design and construction team proceeds in compliance with the credit and documents compliance for submission, review and approval. Through this process, project teams earn credits toward one of four levels of certification including Platinum, Gold, Silver and Certified.

Documentation for LEED certification is extensive and is developed at both the design and construction stage.

⁹ Ref: Readings & Review Section n. 8

¹⁰ Ref: Readings & Review Section n. 9

¹¹ Ref: Readings & Review Section n. 10

¹² Ref: Readings & Review Section n. 11



Multiple parties on the project team including the LEED accredited Professional (LEED AP), designers, contractors and owners may have responsibility for credit documentation. Documentation is submitted to the Green Building Certification Institute (GBCI), which is a sister organization of USGBC. GBCI has a system of credit reviewers and review processes, which are used to determine compliance with individual credits.

USGBC also has a two-step system of accrediting professionals, which includes the Green Associate credential followed by the LEED Accredited Professional (LEED AP). LEED APs may also earn specialty credentials in various standards types. Accreditation of professionals is managed by GBCI.

Lastly, in addition to creating standards systems, USGBC promotes education through many programs on use of the standards and sustainability in general to its members and industry participants. USGBC's multi-faceted approach to developing standards, scientific committees, membership of industry practitioners, certification of buildings, accreditation of industry professionals and education has led it to be an accepted leader in promoting sustainability in buildings throughout the world.

11.5 Elements of LEED

Among the LEED Standards systems, three may be the most applicable to the UNIDO objective of promoting development of sustainable industrial parks and include: LEED v.4.0 for New Construction and Major Renovations, LEED Buildings Operation and Maintenance (OM) and LEED Neighborhood Development (ND). Applicable concepts from these standards systems will be explored in this project.

LEED for New Construction and Major Renovations v.4 addresses individual building projects, LEED OM addresses the ongoing sustainable operation of buildings after completion and LEED ND addresses land development and redevelopment projects.

LEED for New Construction and Major Renovations v.4 consists of a credit and prerequisite library, which addresses a number of fundamental sustainability

concepts. The library consists of the following broad categories: Location and Transportation, Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation and Regional Priority.¹³

LEED OM provides criteria for the ongoing operation of sustainable projects and addresses the same fundamental areas as LEED NC, but also includes a variety of credits that address operational elements such as ongoing energy metering, existing building commissioning, purchasing practices and green cleaning¹⁴.

LEED ND is targeted towards planning and implementation of land development projects and includes fundamental areas of "Smart Location and Linkages", "Neighborhood Pattern and Design", "Green Infrastructure and Buildings", "Innovation and Design Process" and Regional Priority Credits.¹⁵

Within each fundamental area of a LEED standard system there are varying numbers of prerequisites and optional credits. Project teams must meet all prerequisites and threshold levels of optional credits to achieve certification of a project. LEED encourages collaboration and integrative processes among project team participants in selecting which credits to pursue for any given project.

At project inception, the team first commits to include sustainable elements, and then identifies appropriate credits to pursue. Once credits are selected, design and construction are carried out in compliance with the credit requirements. For projects pursuing LEED certification, projects must be registered and documentation collected and developed and submitted to GBCI for review and acceptance.

The LEED systems allow for project teams to select a portfolio of credits that are appropriate for a specific project, location and context. Rarely would all credits apply to a given project. This ability of project teams to select appropriate credits provides flexibility to tailor design and construction solutions. LEED systems also provide for innovations in

¹³ Ref: Readings & Review Section n. 12

¹⁴ Ref: Readings & Review Section n. 13

¹⁵ Ref: Readings & Review Section n. 14



solving sustainability problems in unique ways through “Innovation & Design” credits. One of the major benefits of LEED is that it creates a definition and common language of sustainable building design and construction practices with specific criteria and standards for compliance. Applying these criteria aids a project team to include and plan for sustainable aspects of the project.

Combined, the three LEED standard systems identified above include over 150 prerequisites and credits. For the purpose of this UNIDO module on development of sustainable industrial parks, the credits and prerequisites should be considered as “sets of ideas”, which can be explored for application on projects when appropriate, based on project context and conditions. While some of the credits may not have relevancy in a specific context, many of the underlying concepts of the credits such as saving energy, saving and protecting water, use of local sourced materials, use of safe materials and promoting human health surely will.

During the UNIDO sustainability training, an overview of the three LEED standards systems will be presented and the fundamental credit categories, credits and prerequisites will be identified. Following the overview, a limited number of credits that may be most applicable will be presented in detail. Case study examples will be used to demonstrate design and construction examples for site considerations, energy efficiency examples, water efficiency, materials and resources, health, indoor environmental quality, development infrastructure and operations.

11.6 LEED Case Study

In order to demonstrate the application of LEED credits in a new international context a LEED Platinum School project in Italy will be used in the sustainability module. This case study will be supplemented by additional examples for industrial and warehouse buildings. The Plesso Scolastico Loc. Romarzollo, Arco school project is an elementary school recently constructed in the city of Arco located in the Trentino Province in Northern Italy.



The School of Romarzollo awarded Platinum LEED

In 2012, the project was awarded LEED® Platinum under the LEED for Schools Standards v2.0 by the U.S. Green Building Council. LEED Platinum is the highest level of achievement in the LEED Rating System, and the Arco School was the first school project to achieve this rating in Italy and outside of the US. Faculty and students from the Michigan State University School of Planning, Design and Construction (SPDC), worked from 2007-2012 under a consulting contract with the Comune Di Arco to provide LEED AP coordination and technical services to the project.



Working Teams at the Municipality of Arco

The SPDC was directly responsible for LEED AP services, LEED compliance, coordination, management and oversight of all aspects of LEED and LEED documentation for the project. The overall project team included more than 20 Italian contractors, architects, engineers, agencies and university faculty along with students who worked on the project. The Plesso Scolastico Loc. Romarzollo is an elementary school for 250 students owned by the Comune di Arco.

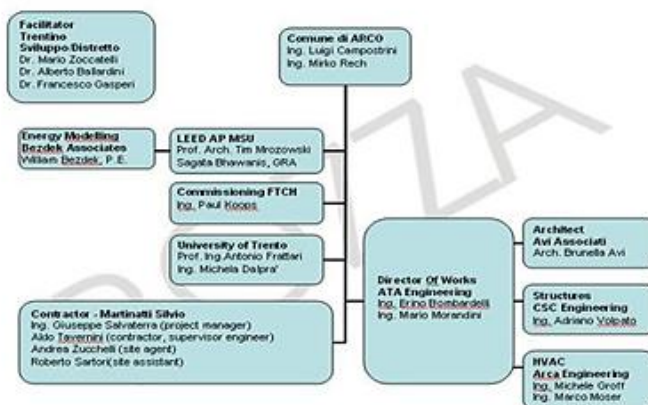


School of Romarzollo under construction

It is a three-story reinforced concrete building, which features photovoltaic systems, high performance glass and shading systems, integral weather station climate controlled systems, green roof, green parking, rain water collection, green materials, site and water features and many indoor environmental

and development agency and business incubator, SPDC faculty and students worked to promote LEED in Italy, consulted in forming the Green Building Council of Italy (GBC Italia), conducted educational sessions and acted as a liaison with USGBC and GBC Italia. As a result of efforts by many Italian professionals, there is now an active GBC Italia with substantial membership, a separate set of Italian LEED standards, which are approved and available for projects by USGBC and GBC Italia, scientific committees and educational programs. The case study will be used to present specific LEED credits, design solutions that were implemented and the documentation developed to provide a real world example for attendees, of a project where there was little LEED experience within a country prior to starting the project.

Prior to the start of the Arco project the Italian project team had no prior experience with LEED standards and many of the reference standards cited in the LEED certification system were not applicable in Italy. Experiences and lessons gained from this project including using collaborative approaches among project participants, the need to research equivalencies between local standards and laws and the LEED reference standards, language differences and building a community of building commissioning and sustainability professionals will be presented.



Arco Project Organizational Chart 2007

quality systems. The project achieved 61 LEED credits plus prerequisites under the LEED v2.0 system of standards qualifying it for LEED Platinum.

Concurrent with the Arco School project, under a second consulting contract with the Agenzia per lo Sviluppo, a Trentino business

11.7 Proposed Sustainability Module

This module section will focus on sustainability and environmental concepts from several standards systems of USGBC including LEED v4.0 for New Construction, LEED OM (Buildings Operation and Maintenance) and LEED ND (Neighborhood Development), which may be applicable to the development of industrial parks in developing countries.

The presentation help in identifying those standards and their underlying sustainability benefits which can be implemented and offer benefit in the context of local conditions.

While LEED certification has been pursued by over 69,000 projects in some 150 countries¹⁶ full LEED certification may or may not be

¹⁶ Ref: Readings & Review Section n. 15

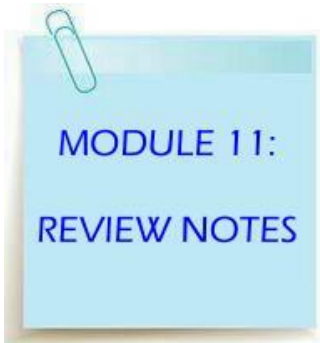


appropriate for an individual project in a local context based on economic, resource, political, technological and social conditions, however many of the underlying sustainability principles that form the basis of the standards can be applicable to any context in which sustainable development is an objective.

This training module on sustainable development of industrial parks in developing countries includes an overview of sustainability standards, and describes the USGBC LEED system and its possible application to these projects. Elements of LEED and a limited number of LEED credits and their underlying sustainable principles will be presented. Credits and prerequisites, which have greater potential for application to these development projects, will be emphasized. A case study project will be used to present design solutions and strategies. Finally, through group discussion, opportunities and barriers will be identified by participants.

11.8 Readings & Review

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<http://www.unep.or.jp/ietc/Focus/Agenda%202021%20BOOK.pdf>
- 2) BREEAM, the world's leading sustainability assessment method for master planning projects, infrastructure and buildings
(WEB site)
<http://www.breeam.com>
- 3) Laura Mark, 2013
LEED outstrips BREEAM across the globe – including Europe
<http://www.architectsjournal.co.uk/news/leed-outstrips-breeam-across-the-globe-including-europe/8643464.article>
- 4) Comprehensive Assessment System for Built Environment Efficiency (CASBEE), Japan
(WEB site)
<http://www.ibec.or.jp/CASBEE/english>
- 5) Green Economy Success Stories
http://www.unep.org/pdf/GreenEconomy_SuccessStories.pdf
- 6) UNIDO Platform – Global Environment facility Programme (GEF) Projects
(WEB site)
<https://open.unido.org/donors/GEF/>
- 7) The U.S. Green Building Council (USGBC)
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- 8) First LEED standard 2000, addressing new construction and major renovations
(WEB site)
<http://www.usgbc.org/about>
- 9) LEED v4 Rating System Selection Guidance
(WEB site)
<http://www.usgbc.org/articles/rating-system-selection-guidance>
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<http://www.usgbc.org/press>
- 11) LEED International Advisory Group
(WEB site)
<http://www.usgbc.org/organizations/members/international-roundtable-member>
- 12) LEED Credits Library
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<http://www.usgbc.org/credits>
- 13) LEED v4 Checklist for Building Operations and Maintenance
(WEB site)
<https://www.usgbc.org/resources/checklist-leed-v4-building-operations-and-maintenance>
- 14) LEED v4 Checklist for Neighborhood Development
(WEB site)
<http://www.usgbc.org/resources/leed-v4-neighborhood-development-checklist>
- 15) LEED List of projects
(WEB site)
<http://www.usgbc.org/projects>
- 16) The U.S. General Services Administration (GSA), Sustainable Design
(WEB site)
<http://www.gsa.gov/portal/content/104462>



- a. Are local standards, laws and regulations currently stringent on application of sustainable principles of social architecture, namely in construction of community buildings, such as schools, hospitals, industrial factories/parks, etc. in your country location?

- b. Would you consider following the recommended actions of “Agenda 21 for Sustainable Construction in Developing Countries” in your field of competence?

- c. Following the presentation of this module, do you consider the application of sustainable construction standards a priority in the construction/renovation of industrial parks in your country location?

- d. Would you consider pursuing LEED or other international certifications to enhance the sustainability of industrial park construction/renovation and operations?



MODULE 12: MONITORING THE PERFORMANCE OF AN INDUSTRIAL PARK

12. Monitoring results based performance

Industrial park has a tendency to be considered a panacea for addressing and solving all the economic problems of a region or location where being established. It is therefore necessary to warn against exaggerated or unrealistic expectations of success. Experience carried out on industrial parks in developed countries, which have been longer involved in their set-up and operations, show that it can take many years before the benefits of an industrial park can be observed. Therefore to achieve the expected results in a medium-long term, the planning of an industrial park should clearly specify the targets against which the performance of the industrial park can be yearly monitored and evaluated. Performance targets cannot be measured against rigid and universally applicable indicators. Each industrial park has different objective/s, sponsors, location and available capacities, thus performance monitoring must be planned, organized and carried out with a flexible approach, related to the peculiarities of the park. Time is an additional variable. The age of an industrial park is of critical importance. After a number of years of operation, certain targets, which might have been achieved after five-ten years, should be also modified, due to an overall change of the external and probably internal environment of the industrial park. Then a re-engineering process should be established in order to achieve further socio-economic, environmental and financial results.

12.1. Developing criteria and indicators for park assessment

Due to the relative longer experience in operating industrial parks, more and more critical attitudes have been raising towards their effectiveness in developed countries. Nowadays public funds require more and more justifications for their utilization, especially when dealing with private sector development.

Industrial parks have been often criticized as being “white elephants” and not effective tools for regional development; therefore increasing attention should be paid towards measuring and possibly justifying their effectiveness. There are a number of indicators that can be used to monitor and evaluate an industrial park’s performance in short and medium-long term. The list of indicators provided below does not pretend to be exhaustive, rather to provide a general overview of the criteria to manage performance monitoring. Some examples of performance indicators developed and applied in industrial parks are provided in Readings section. In the short term, some measurements of the industrial park’s economic impact can be inferred from its success in creating new businesses. The comprehensive assessment of its impact, including job creation, R&D commercialization, import substitution, and economic development in general, can only be achieved in the medium-long term.

Performance indicators can relate to:

Local impact: The measurements of an industrial park’s local impact are usually enterprise development, job and wealth creation:

- 📍 Enterprise creation and development, which consists of the number of companies and new business startups operational in the park over a given period;
- 📍 Employment creation, which is the number of new jobs, particularly the amount of skilled labor in tenant firms. In assessing employment effects, some attempts should be made to calculate net job creation by taking into account displacement, that is jobs lost in competitor firms, and multiplier effects, such as jobs created in supplier firms;
- 📍 Wealth creation for added value of tenant firms, ensuring that companies match admission criteria and their businesses contribute to regional industrial development priorities. These measurements can include tax revenues from tenants or R&D indicators, such as the total number of domestic patent applications or registrations, or R&D expenditures of tenants.



Operational efficiency: In this case performance indicators to measure it, may include:

- 📍 Number of enquiries received by the industrial park from potential entrepreneur detection;
- 📍 The rate at which these are converted into applications for admission;
- 📍 The number and type of tenants admitted to the industrial park, as specified in the admission criteria;
- 📍 The efficiency of provision of facilities and services measured against satisfaction rate by tenants;
- 📍 The amount of access to capital obtained by tenants from any source: commercial/development banks, national or international donors, private investors, venture capitalists, etc.
- 📍 Minimizing the failure rate of tenants over a given period.

Financial performance: The appropriate indicators for measuring this performance will be contained in the industrial park financial plan and include:

- 📍 Rental and other services incomes per year and their growth over a period;
- 📍 The level of operating incomes and expenditures versus budget projections;
- 📍 Success in achieving a positive cash flow target measured against original forecast aiming at financial self-sustainability;
- 📍 Profitability of the industrial park.

Performance indicators are also used to motivate the management team to exceed planned targets and not to merely achieve the minimum results, and allow the use of staff performance-related remuneration packages.

They may be also used as transparent criteria to assess the performance of industrial park management, independently from the decided sourcing of staff, whether selected from private sector or seconded from public sector.

This could be done using some indicators, as suggested for monitoring and evaluating industrial park's performance.

Sustainability: The measurement of environmental impact usually addresses: water contamination, resource conservation, resource security, dust, noise and air emission impact.

The indicators commonly used are:

- 📍 Quantity of resource consumption of direct material inputs, water input, energy input;
- 📍 Amount of use of own resources versus imported,
- 📍 Rate level of eco-efficiency or eco-intensity.

12.2. Assessment of impact, effectiveness and sustainability

The assessment process of impact on economic development is just at the initial stage when applied to developing countries. Available literature on assessments and evaluations of industrial parks cover more often developed countries, with increasing exercises developed in Brazil, China and India.

An assessment of the industrial park's operational and financial performance can be carried out in the short term, i.e. after 3 years, using information that should be readily available from the management team. A more comprehensive evaluation needs considerable higher amount of data collection and fieldwork, and is usually deferred for at least 5 years.

The analysis should firstly aim at categorizing the typology of park to be assessed. Several models of industrial parks have been developed in the world, however till now no international classification has been established to define the specific characteristics of an industrial park. The concept of an industrial park, independently of the country where it has been established, ranges from limited unequipped industrial sheds to last trendy fourth generation parks, involving clean technology, biotechnology, robotics, digital platforms, etc. A variety of other models stay within these categories and far more difficult is to assess categories involving different levels of technological, management and infrastructure support.



Another consideration in the evaluation of impact and effectiveness is whether to weigh higher the measurement of the internal park performance, or rather to understand whether an industrial park can be or has been a useful tool for regional development. As mentioned, many industrial parks have been developed worldwide especially in a period when public expenditure is under strict control and limited to necessary interventions, thus it is of extreme importance to justify the investment in private sector development institutions.

An industrial park has multiple stakeholders with diverse goals: university or research institutes, regional development agencies and/or other local authorities. The structure and development of tenant activities should be also assessed, by measuring the satisfaction of clients with respect to industrial park activities. It will be difficult to compare data referring to both categories: clients and promoters, and again a specific distinction should be made between the two assessed targets. Furthermore the quality of services in a given industrial park is a function of the quality of the people providing the services; thus specific measurements should be attributed to the quality of industrial park managers.

The age of the industrial park is another variable to take into consideration when carrying out an impact assessment. Certainly the effectiveness of facilities of a 3 or 5-years old industrial park, which is still in the process of fine-tuning its infrastructure and services, cannot be benchmarked with that of 15 years-old one. Long term initiatives like industrial parks need a long time to reach optimum levels; hence evaluating the performance of industrial parks halfway through their development would only provide a partial assessment.

With regard to the question about who should assess the industrial park, the consideration is whether external evaluators should be involved and/or which could be the role of a self-assessment. The independence of external assessors could be useful because they are not involved in local political matters, they do not have direct interests in the initiative, and they are specialized in carrying out such activities.

International agencies, such as UNIDO, have a clear role as external evaluator, having no commercial and bilateral interests. In developing countries, UNIDO assistance to measure the success of existing parks is instrumental to promote research and better analysis to justify industrial park development, to then promote the establishment of additional effective and efficient ones.

It could be further distinguished the assessment of relevance of an industrial park, before it has been established, and the monitoring and evaluation, *ex post*. An independent team of assessors might conduct the first; the second could be based on a self-assessment accompanied by an external panel yearly review, for example each three years.

The criteria being used to perform an assessment of an industrial park, involving different actors, different clients, and established in different environments cannot be the same in all respect. If we assess an industrial park, the cost of quality is relevant too, since most of the tenants in an industrial park tend to be small and medium firms, which choose a park due, among other things, to affordable costs of facilities and services. When we consider the amount of investment in an industrial park and related indicators, such as cost per enterprise created and cost per job generated, costs need to be weighed using Purchasing Power Parity or other measures.

Even more difficult will be to assess the quality of certain indicators such as added value of the industrial park to its tenants firm, the number of firms started with active support off-the industrial park organization, level of political satisfaction of the promoter, social wealth in the community, etc.

Different initiatives belong to different environments and even if we arrive at an exhaustive list of performance indicators, a mechanical application of these indicators to any industrial park may not be very helpful. We need to take into account the impact of the overall environment on the performance of the industrial park. The economic and technological milieu, where an industrial park is operating in, will have a bearing on its different facets. The hypothesis often



assumed is that “successful” industrial parks are more often located in “successful regions”. Even if the quality of facilities and services in a particular industrial park is rather different, the tenants will still be better off-the industrial park located in a region with highly developed infrastructure facilities and support services.

To sum up, the step towards designing a methodology for impact assessment of industrial parks in developing countries is to attempt to position them in appropriate slots to take into account their focus, their age, their promoters, their clients, the region - developed countries, newly industrialized countries, least developed countries, etc.

The evaluation process needs necessarily to examine the strategic aims of the industrial park and determine how far the choice of location, the facilities planned and the package of services provided are in conformity with predetermined goals of the industrial park.

For instance if an industrial park sets for itself the goal of promoting small and medium firms in knowledge based industries like software and biotechnology, it has to satisfy a set of conditions like: proximity to a centre of excellence, university or research institute, appropriate physical facilities with advance telecommunication, library, conference halls at affordable prices, industry specific infrastructure, full range of professional business development support, such as feasibility studies, business planning, patent licensing, funding options, internal and external networking of clients and proximity to a urban centre. Having considered an assessment mainly during the process of an industrial park establishment, a further consideration, ex post, should be done for its impact to surrounding social and economic environments.

The objective of the ex-post evaluation is to measure the impact of an industrial park on the regional socio-economic environment, i.e. to verify the efficiency of its actions with regard to the strengthening of innovative performance of the country or Region. In particular, the ex post evaluation should assess the results against the initial, and possibly modified during the on-going

monitoring, objectives set for the industrial park.

Ex post evaluation should answer to questions related to regional development indicators, such as: how many jobs have been created in the companies, which have benefited directly and indirectly of the existence of the industrial park? Have they triggered the development of activities outside the industrial park, in the Region? Has the co-ordination of support organizations and other regional players, achieved through the industrial park, resulted in a better visibility, an improved use of their competencies from companies' point of view?

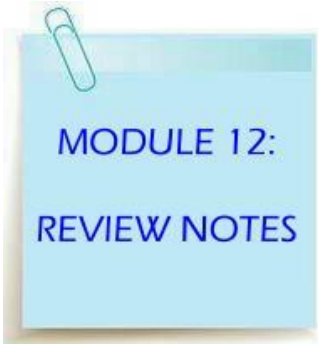
Nevertheless such indicators are notoriously difficult to create, as one cannot attribute effects to sole causes. A compromise needs to be found between the need for precise data, as required by policy makers and the feasibility of indicators to be created and the cost and time to assess them. No matter what type of project /initiative is contemplated, the time to lay the foundations for a useful follow-up is early on, preferably at the planning stage, before the implementation starts. This is the period when objectives and targets are defined, and monitoring and evaluation arrangements can be established, so that appropriate information can be collected and used strategically.

12.3 Readings & Review

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a. What do you consider being the economic justification to invest public funds in an industrial park in your country location?

b. For what reasons would you consider that industrial park achievements could contribute to the success of regional or national economy of your country?

c. What are your expected targets of industrial park development in your country location and in how many years would you expect to achieve them?

d. Do you consider that an external evaluator specialized in industrial park development from the same Region, from a developed country, or an international organization should assess the performance of the industrial park in your country location or the evaluation should be carried out through self-assessment?



Authors Biographies

Fabrizio Condorelli, Senior Expert of United Nations and European Union organizations for more than 25 years in the design, planning and implementation of industrial and technology parks, innovation centres and incubation facilities in some 30 countries of Africa, Asia, Arab Region, Central & Eastern Europe and Latin America, including the development of methodological and financial tools to plan and manage parks & incubators. He has contributed to international assessments and benchmarking of parks and incubators in Brazil, China, Czech Republic, Mexico, Nigeria, Poland, Turkey with the United Nations Industrial Development Organization, the United Nations Development Programme and the Organization of American States, in the Arab Region with UN Economic and Social Commission for Western Asia, in Central Asia with the Eurasian Economic Community; authoring publications on planning and evaluation of business incubation and parks and serving as trainer on business incubation at the UN International Labour Organization.

Zenia Kotval PhD FAICP is a professor of urban and regional planning at Michigan State University. She has twenty-five years of planning experience. She holds a bachelor's degree in architecture and masters and Ph.D. degrees in urban and regional planning from the University of Massachusetts. Dr. Kotval's expertise lies in comprehensive economic development plans, economic impact studies, fiscal impact analyses, revitalization of older areas, specifically industrial areas, waterfronts and port areas and downtown commercial areas. She has taught extensively in Europe and Eastern European countries. She is a Fulbright Scholar and a Fellow of the American Institute of Certified Planners.

Zeenat Kotval- Karamchandani PhD is an Assistant Professor of Urban and Regional Planning with the School of Planning, Design and Construction at Michigan State University. Her research interests lie in the environmental and health impacts of the built environment and human behaviour. Additionally her recent research areas extend transportation and travel accessibility to food

security (focusing on India specifically) and well-being through increased mobility for older adults (focus specifically on U.S. cities).

Bill Lennertz, AIA, is Executive Director of the National Charrette Institute. Bill is a principal author and lead trainer of the NCI Charrette System™, the first structured approach to design-based collaborative community planning. Since he co-founded NCI in 2001, Bill has trained top staff from various organizations including the US Environmental Protection Agency, US General Services Administration, US Department of Housing and Urban Development, Fannie Mae Foundation, and Departments of Transportation in Oregon, New York, and Arizona, as well as many private planning firms across the country. Bill co-authored *The Charrette Handbook*, published by the American Planning Association, is the co-editor and essayist of *Towns and Town-Making Principles*, a monograph on DPZ, and a contributor to the *Charter of the New Urbanism*. Bill has taught at various universities including Harvard, where he received his Masters of Architecture in Urban Design and now annually teaches the NCI Charrette System™ certificate course.

Jason Meyers is a content, event, and marketing expert with more than 20 years of experience in a broad range of business sectors. Meyers currently is the director of content strategy for Chicago-based association management firm SmithBucklin. His professional journalism career spans roles as executive editor of *Entrepreneur* magazine, executive editor of online business community *Light Reading*, and editor-in-chief of the business-to-business media outlets *Telephony* and *Wireless Review*. In the content marketing realm, Meyers was managing director of the custom media division of Penton Media, overseeing custom content development, research operations, and global content licensing for business-to-business media brands in more than 30 vertical industries. Since 2008, Meyers has owned and operated Live Concepts, a media company that produces content and events in partnership with media companies, marketing and PR firms, associations, and other organizations. Live Concepts was conceived and launched in the Technology Innovation Center, a



business accelerator based in East Lansing, Michigan. He has a bachelor's degree in journalism from Michigan State University.

Tim Mrozowski A.I.A., LEED® AP BDC, is a practicing architect and Professor of Construction Management in SPDC at MSU where he Co-Directs the MSU Construction Industry Research and Education Center (CIREC). He conducts research on sustainability, application of LEED® to design and construction, energy codes, energy audits, energy modeling and construction project management. Mrozowski has traveled to Italy extensively over the last 10 years and provided LEED® AP services for the LEED® Platinum Plesso scolastico Loc. Romarollo, Arco (TN), Italy and educational consultancy to the Green Building Council Italia, as it was being formed. His recent research and outreach projects include: Deep Energy Retrofit research sponsored by the U.S. Department of Energy, the Michigan Energy Code Training and Implementation Project, Great Lakes High Performance Building Conference, application of LEED standards to Northern Climates, a study of a biomass fuel storage facility for the T.B. Simon Power Plant, energy assessments for the 15,000 student MSU Residence Hall System, adoption of LEED® construction standards at MSU, and construction project management research and outreach on change orders, construction project closeout, post occupancy evaluation and project management of steel construction.

Matt Syal PhD LEED® AP CPC CGP serves as a Professor of Construction Management in the School of Planning, Design and Construction at Michigan State University. He is a LEED® accredited professional and received his Ph.D. in Civil Engineering (Construction Engineering and Management) from Penn State University in 1992. Prior to joining the academic world in 1988, he worked as an estimator and project manager for a general contracting firm in the Boston area and earlier, with construction companies in India, Middle East and Africa. Prof. Seal has conducted research and published extensively in the areas of Construction Project Management, Housing, and Sustainable Built Environment. He has been involved in around 50 research/outreach

projects funded by the industry, U.S. state and national government agencies, foundations and international agencies. He authored the module on Construction Project Management in the Encyclopaedia of Life Support Systems (EOLSS) sponsored by UNESCO. Overall, he has published over 100 refereed/professional papers and over 50 project reports/monographs. In addition, he has served as an advisor or consultant to over 25 industry, academic and government organizations in the U.S. and worldwide.

Jeff Smith MURP is Director of the University Corporate Research Park at MSU Foundation. In this role, Jeff facilitates opportunities for corporate innovation with the University, and develops opportunities and resources for companies commercializing University technologies into the marketplace. Prior to this role, Jeff was the Director of the New Economy Division of LEAP in Lansing, Michigan. The division's mission was to create and support the culture of entrepreneurship and innovation in the Lansing Region, thru Business Incubation, Acceleration, Programs and Events, Jeff has been involved in the launch of the East Lansing Technology Innovation Center, The Hatch, Lansing Startup Weekend, Ignite Lansing, The Hatching, Launched, as well as manager of the Lansing Regional Smartzone. Smith has served as a board member on the Entrepreneur Institute of Mid-Michigan, the Downtown Lansing YMCA, Prima Civitas Foundation, and the Capitol Collective. He received the Lansing "10 Over the Next Ten" award and "Volunteer of the Year" by the YMCA of Metro Lansing. Jeff currently sits on the Michigan Economic Development Corporation Advisory Board for Redevelopment Ready Communities, as well as Government Relations Chair of the Friends of the Lansing River Trail Board. Jeff is a proud graduate of Michigan State University, earning both a Bachelor's Degree in telecommunications and a Master's Degree in Urban and Regional Planning.

Eric J. Strauss, PhD, JD, AICP is a Professor of Urban and Regional Planning in the School of Planning, Design and Construction at Michigan State University. He has taught at universities in Kansas, Indiana Mississippi as well as Wisconsin. He has lectured in universities in Ireland, England, Germany,



Romania, Turkey, South Korea and China. He was a Fulbright Specialist to the Municipality of Panama City, Panama. He has over 45 years' experience in planning practice in the public and private sector. He has been a planner for federal and state governments, a City and County Planning Director, a City Attorney and a consultant to over 50 organizations, both public and private on a wide variety of planning related issues. He has prepared many comprehensive plans and land use regulations at all levels of detail for many communities. His most recent book is "Planning for Wicked Problems: A Planner's Guide to Land Use Law" (with Dawn Jourdan, Routledge: 2015).

Mark Wilson, PhD is Professor of Urban and Regional Planning in the School of Planning, Design and Construction at Michigan State University. He recently ended an eight year term as Chair of the International Geographical Union Commission on the Geography of Global Information Society. Research and teaching interests address urban planning, urban and regional economic development, information technology, public policy, and non-profit organizations. Current projects include planning for industrial parks in Africa and the Middle East, mega event planning for world's fairs and Olympics, innovation and information technology access in Michigan, and the planning of knowledge and innovation clusters.

