STRATEGIC PLAN

for Ashdod's Industrial Areas

Tali Hatuka | Sunny Menozzi Peterson | Einat Pragier

TEL AVIV UNIVERSITY אוניברסיטת תל אביב

LCUD Laboratory of Contemporary Urban Design

Strategic Plan for Ashdod's Industrial Areas
was written and compiled by:

Tali Hatuka
Sunny Menozzi Peterson
Einat Pragier

We thank the following organizations for their generous support:
Vice President for Research, Tel Aviv University
Industry Development Division, Ashdod Municipality

Graphic Design: Rachel Freedman

July, 2017, Tel Aviv

Introduction and Goals

In the competition among cities for manufacturers and industrial investment, the functionality and efficiency of a city's industrial areas are decisive factors. Other increasingly decisive factors include geographical proximity and community. The evolution of manufacturing, termed the "Fourth Industrial Revolution" by Klaus Schwab, is altering manufacturers' calculations with regard to site selection. Proximity to suppliers and markets, to the city center and its varied resources, and to residential areas is increasingly important. A sense of community and social relationships are also seen as core resources. The increasing importance of these factors has made flexible and innovative land use regulations and building codes highly desirable. While policymakers are responding to the trending importance of these factors, especially through economic development strategies that aim to cultivate cross-sector collaborations and partnerships, the field of urban planning is not offering new spatial models that might influence strategic thinking about industrial development and cities' resiliency.

Striving to guarantee Ashdod's competitiveness and resiliency and to make Ashdod a leader in industrial and technological innovation through city design, Yehuda Frankel, City Council Member in charge of Education & Industrial Development, and Dr. Smadar Itzkovich, Head of the Industry Development Division, initiated this project. Recognizing the great economic and social opportunities inherent in the development of a new port, the construction of the Assuta Ashdod University Hospital, and the development of a new industrial area on the city's southern edge, they decided to approach the Academy to develop a cutting-edge vision for the future planning and development of Ashdod's industrial areas. This initiative is unique and signals their great commitment to this endeavor.

This project has two phases.

Phase I, a preliminary study conducted by students from Tel Aviv University and MIT, aims to understand the spatial effects and dynamics of 21st-century manufacturing, and to recommend policies that respond to these effects and dynamics. During a 10-day workshop in Ashdod and at Tel Aviv University, students examined and analyzed Ashdod's industrial areas. The preliminary study is divided into two booklets: the first focuses on the existing conditions of and opportunities for Ashdod's industrial sites, and was written by Tel Aviv University students guided by Dr. Tali Hatuka; and the second focuses on case studies from around the globe and applicable lessons for the city of Ashdod, and was written by MIT students guided by Prof. Eran Ben-Joseph (see also http://www.industrialurbanism.com/ashdod).

Phase II, a strategic plan developed in the Laboratory of Urban Design at Tel Aviv University by Tali Hatuka, Sunny Menozzi Peterson, and Einat Pragier, aims to develop a vision for Ashdod's industrial areas. More specifically, the plan aims to: (1) understand the features and character of Ashdod's industrial areas; (2) develop strategies for physical planning and policy development; and (3) study and highlight the relevancy of ideas and strategies from around the world in the field of industrial planning and development.

For the first time, this plan assesses the role and identity of each industrial area within the city, viewing each as a single, unique entity and, at the same time, an integral part of the whole.

This document consists of three parts: (1) an overview of the industrial areas in the context of Ashdod's defining features, spatial structure, and current city planning and policy initiatives; (2) a suggested framework for further action on the development of the industrial areas; and (3) a vision and a targeted strategy for industrial planning and development in the city. We hope this strategic plan will provide the city with guiding ideas and practical tools that will aid it in the critical task of developing the physical and social infrastructure necessary for a robust and thriving industrial sector.

Many have assisted in the development and drafting of this plan, and we are grateful for the knowledge and data that they have shared with us. We wish to thank Dr. Yechiel Lasry, Mayor of the City of Ashdod; Yehuda Frankel, City Council Member in charge of Education & Industrial Development; Ilan Ben Adi, General Manager; Doron Hazan, City Engineer-Architect; and Dr. Smadar Itzkovich, Head of the Industry Development Division.

Support for this project is provided by the City of Ashdod, the President of Tel Aviv University, and the Vice President of Tel Aviv University for Research and Development.

Dr. Tali Hatuka,
Head, Laboratory of Urban Design, Urban Planning, TAU

Table of Contents

1 Ashdod's Industrial Areas
The Way Forward

1. Ashdod's Industrial Areas: The Way Forward

Large-scale industrial activity is a defining feature of Ashdod. The proportion of the city set aside for industrial use reflects this, as does the variety of the city's industries. Ashdod hosts nationally important infrastructure, including the Israeli Electric Company's Eshkol power plant, the Port of Ashdod (the largest cargo port by volume in Israel), and a desalination plant as well as privately-owned natural gas power plants, refineries, fuel storage facilities, and a natural gas receiving station. The cumulative impact of these facilities is significant. They affect the economy of the city and environmental factors such as air quality, risk of soil and groundwater contamination, and the risk of a hazardous event.

This chapter introduces elements central to developing a vision for Ashdod's industrial sector and industrial areas. These elements include the following: (1) the unique spatial structure of the city; (2) the spatial organization of industry within the city and resultant conflicts; (3) policy initiatives associated with the city's industrial sector; and (4) the Ashdod master plan and its central ideas.

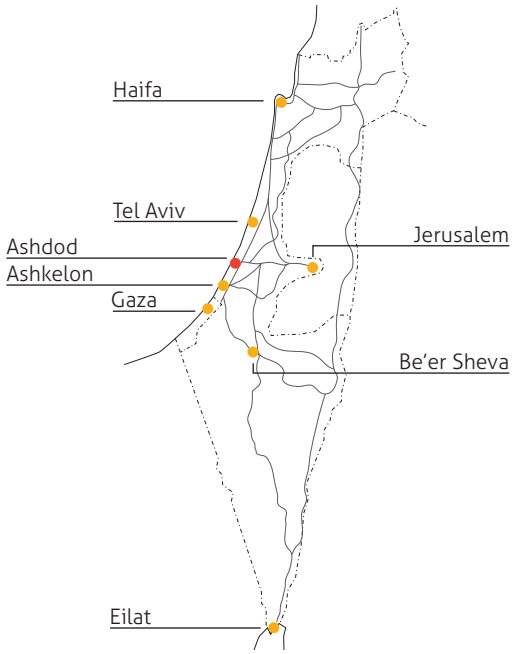
1.1. Ashdod: A Planned, Industrial City

Ashdod, a city spanning 46.13 sq. km. and home to 218,000 residents, is a port city. The Port of Ashdod is one of two major cargo ports in Israel, the other being in Haifa. Ashdod's port is crucial to Israel's economy and is important to trade between Europe and the Middle East. In addition to its port, Ashdod has six industrial areas (including the Special Quarter), 17 residential quarters, and a central business district and leisure area (the Kirya Quarter), with a seaside promenade. Spatially, the Lachish Stream separates the northern industrial areas and the port from the so-called heavy and light industrial areas and the remainder of the city. This stream and its park, along with Ashdod Yam Park, Ben Gurion Park, the Elisheva Garden, and Giv'at Yona Garden, are the city's main green spaces. Other important public outdoor spaces include the beach, the gardens in each neighborhood, and

the Nitzanim Sand Dune Park, a nature reserve to the city's south.

Ashdod is a planned city. In 1956, as part of its plan to disperse Israel's population from the country's center (still an important objective in Israeli planning), the government approved the construction of Ashdod. The city was meant to be a garden city for 50,000 people, but for financial reasons, its plan was adapted to accommodate a population of 300,000. Each of Ashdod's 17 neighborhoods, divided from one another by collector or arterial roads, was meant to accommodate roughly 16,000 people and to provide services meeting families' day-to-day needs. Thus, the neighborhoods have a mixed-use core with shops, a school, a park, etc. Cul-de-sacs branch off from this core. The neighborhoods were intended to be economically and socially integrated to encourage the mixing of immigrants from various countries.

Ashdod is the most populous city in southern Israel and the sixth largest city in the country overall. Many immigrants settled in Ashdod, especially during the 1990s, when immigrants from the Former Soviet Union migrated to Israel. Immigration and a high birth rate have kept the city demographically young: roughly 70% of the population is between 20 and 40 years old.



View of Ashdod,1966 | *Fritz Cohen*

Port of Ashdod, 1966 | *Fritz Cohen*

1.2. Ashdod's Industrial Areas

There is a clear division between the city's industrial areas (north) and its residential quarters (south). However, pollution spreads toward the quarters, with many polluting factories located in proximity to residential areas. The following describes (1) the spatial organization of the industrial areas within Ashdod; (2) the current programs of the areas and general guidelines; and (3) environmental concerns.

Main Features of Ashdod's Industrial Geography

- Clear physical boundaries (e.g., a stream, main road) typically separate industrial areas from the wider city.
- Nationally important infrastructure and heavy polluters are located north of the Lachish Stream. Some heavy but mostly light industrial uses are located south of the stream.
- The industrial areas may be loosely categorized by their specializations. These are (1) national infrastructure and heavy and light industry; (2) logistics; and (3) mixed-use development (industrial and commercial uses, including high-tech industry).
- The intrusion of commercial uses into the city's industrial areas is encouraging manufacturers to choose sites south of the Lachish Stream, causing an environmental conflict, especially with regard to the presence of hazardous substances, on the one hand, and the presence of businesses that draw customers to the area, on the other.

Industrial Areas' Programs, as Defined by the Municipality

- **Heavy industrial area.** The approved plan allows a mix of uses. In recent years, this area has evolved, adding non-industrial, commercial uses. Today, calling this area the heavy industrial area is a misnomer.
- **Light industrial area**. The approved plan recognizes this as an area for small industries (e.g., craft and trade, building materials suppliers).
- **North industrial area.** The approved plan allows commercial uses and workshops on some streets. Presently, it is mostly undeveloped land and does not have a mix of uses.
- **South or high-tech industrial area.** The approved plan allows high-tech and trade industries in a limited quantity. Environmental conflicts between these industries, residential developments, and the other tenants that attract customers or members of the public to the area, including the Assuta Ashdod University Hospital, are not anticipated.
- **Back-of-the-Port area.** The approved plan recognizes this as an area for logistics facilities. This area has only been loosely planned and is mostly a container storage area. Organized development is very limited.

National Infrastructure | *Max Moinian*

Logistics | *Max Moinian*

Interface between Heavy Industry and the Street | *Zoë Taft Mueller*

Main Features of Ashdod's Industrial Geography

Industrial Areas' Programs, as Defined by the Municipality

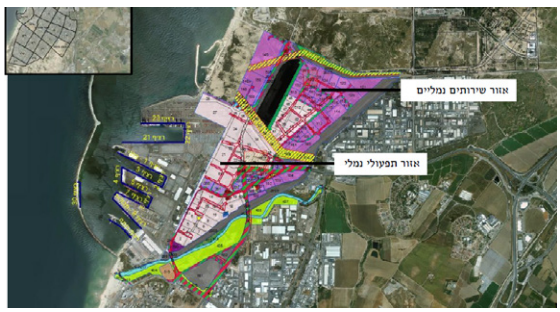
New North | Manufacturing
1,500 dunam; 1,494 dunam available

North | Logistics and Manufacturing
2,500 dunam; limited land available

Light | Workshops and Garages
650 dunam; 200 dunam available

Heavy | Integrated Manufactturing
1,600 dunam; 240 dunam available

Southern | High Tech
New development



Back of the Port | Logistics
4,855 dunam; limited land available

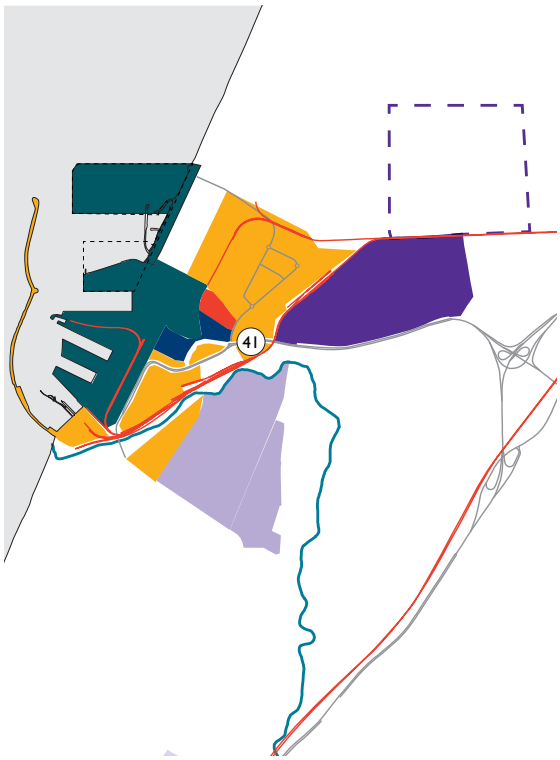
Port-City Interface

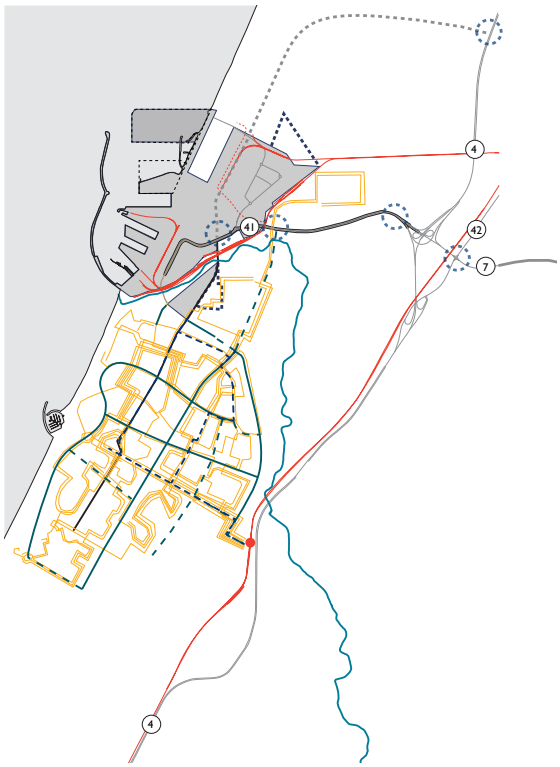
- Ashdod Port is important locally, regionally, and internationally and is significant economically and politically. Ashdod is the port's "host" city and the port is an inseparable piece of the wider city. Yet, the development of the port and the physical planning and economic development of the back-of-the-port area seems to progress without city involvement or a planning framework that works to channel market forces into building a highly functional and efficient area that economically benefits the wider city.
- The way that the city and the port authority interpret the relationship between the city and the port and the language used to describe this relationship determines the role of the port in the city and the role of the city vis-à-vis the port in the planning of the port areas. Ashdod City must reassess its interface with the port. Scholarly literature distinguishes between two model interfaces. In the "Port City" model, the city and the port are perceived as two distinct entities, and the port is usually of secondary value. Examples include the cities of Bangkok and New York. In contrast, in the "City Port" model the port is the heart of the city – central to its economic growth, daily life, and identity. Generally, the port and the city are perceived as a single entity. Examples include Rotterdam and Le Havre.
- The conception of the city and the port as divisible entities under the "Port City" model is misleading. In terms of planning for functionality and efficiency it is imperative that the city – including its port – be analyzed as a single entity, with special attention given to interconnections between the city and the port.
- In spite of the large number of plans Ashdod City has developed in recent years for areas adjacent to the port, there is no plan for the back-of-the-port area. Extant provisions mainly focus on land allocation and transportation planning for the port.
- The limited connections and dialogue between the Municipality of Ashdod, Hanni, and the bodies responsible for the operation and consolidation of the port inhibit coordinated cooperation, despite their shared interest in the development and long-term prosperity of the region.

Environmental Concerns

- Winds from the north blow pollutants south toward Ashdod's residential areas, and wind direction and speed would influence the degree of danger in the event of an industrial accident. It is likely that emissions from the so-called heavy industrial area and the port area will be blown toward residential areas. It is less likely that emissions from the north industrial area will blow toward residential areas and even more unlikely that emissions from the new north industrial area will be blown there.
- Despite the adoption of a regulation that mandates separation distances between between facilities that pose a risk to the public and public areas, development in the heavy industrial area indicates that this regulation has not been effective and there are conflicting development trends that jeopardize public health. Over the last few decades, industrial areas have developed randomly, and clusters of industrial risk have been established in proximity to the port. Within these clusters, there is no strict adherence to the required separation distances, and areas of overlapping risk exist. Mixing uses leads to a significant conflict, first, because of the nuisances that result from industrial activity, and second, because of the risks posed by the storage of hazardous materials. This conflict significantly limits the introduction of new uses into the industrial areas. Most of the businesses that store hazardous materials are concentrated in the north industrial area, the back of the port, and the heavy industrial area.
- Port, industrial, and commercial activities that involve the storage of hazardous substances

Port-City Interface





Land Use

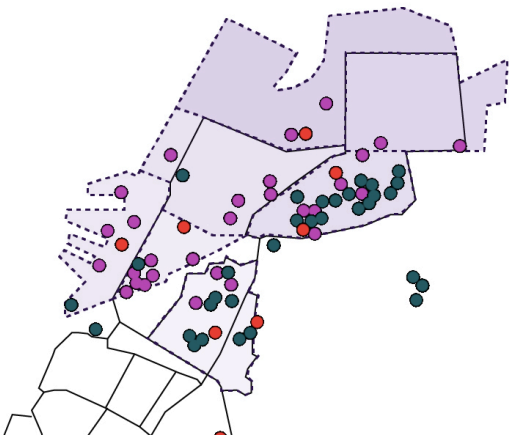
- Ashdod Port Authority Ltd.
- Israel Ports Authority Ltd.
- Port Entrance
- Train Terminal
- Logistics Area
- Light and Heavy Industrial Area
- Future Northern Industrial Area

Existing Conditions

- Port Authority Property Line
- Port Limits (Statutory)
- Existing Route / Intersection
- Planned Route / Intersection
- Road
- Main Access Road
- Railroad
- Bus Lines
- Bike Lanes
- Future BRT Route
- Planned Interchange

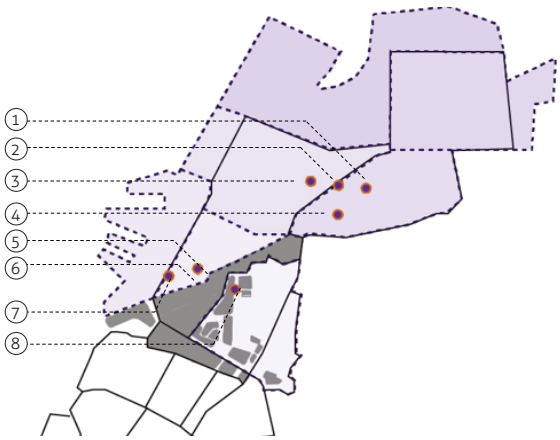
Maps from Bramli, Efrath and Noy, Kfir in *An Analysis of the Industrial Areas in Ashdod: Physical, Social, and Administrative Dimensions*, 2017 (http://www.industrialurbanism.com/report-ashdod-1)

Environmental Concerns



Permits for Hazardous Materials

- Ionizing Radiation Permit
- Hazardous Materials Level A Permit
- Hazardous Materials Level B Permit



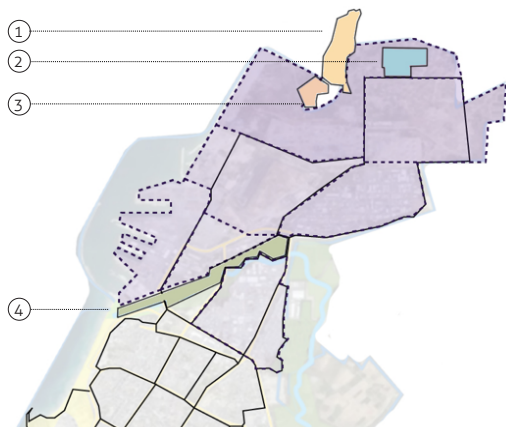
Where Hazardous Materials are Used + Stored

1. Acidic Gases in Use (Ethylene Oxide)
2. Chemical Production Factory
3. Sulfur Terminal
4. AGAN Chemicals
5. Hazardous Materials Storage
6. Hazardous Materials Storage
7. Bonded Warehouses with Poison Permits
8. Ammonia Storage

LCUD

Zoë Taft Mueller

Diagrams from Bar Ilan, Ayelet and Furshik, Yulia in *An Analysis of the Industrial Areas in Ashdod: Physical, Social, and Administrative Dimensions*, 2017 (http://www.industrialurbanism.com/report-ashdod-1)



Restoration of Landfills

1. Landfills Closed for Rehabilitation
2. Deserted Drainage Pools
3. Closed Landfills
4. Lachish Park

Landscape Sensitivity

- Highest level of sensitivity
  Development not allowed
- High level of sensitivity
  Conservation and limited use only
- Hazardous Materials Level B Permit
  Specific activity by permit
- Low level of sensitivity
  Tourism and development
- Nature and Landscape Value
  Spot conservation as appropriate

are conducted without transparency and the extent to which hazardous substances are stored near populated areas is largely hidden.

- There are currently no clear regulations governing the storage of a variety of hazardous substances arriving by indirect delivery. While existing storage spaces are permitted through poison permits, these do not indicate or regulate how the substances are stored and handled. In total, 107 businesses in Ashdod hold valid poison permits. The permits for toxins are divided into three levels: Level A, dealing with dangerous substances that constitute a high risk (granted for one year); Level B, dealing with hazardous substances that constitute a medium risk (granted for two years); and Level C, dealing with hazardous substances that constitute a low risk (granted for three years). A mapping of the poison permits exposes the spatial distribution according to the number of risk factors present in each region. However, the mapping does not provide complete information on how these materials are used or for how long they are stored near public facilities and spaces.

In sum, the industrial areas are neglected in terms of planning and development and are generally detached from the city. Some of these areas are undergoing a process of bottom-up transformation, with new uses changing the features and the character of the area. Thus, the older industrial areas of Ashdod (the so-called heavy and light industrial areas), which previously contained only factories and workshops, are undergoing a process of change with the addition of new uses - offices, businesses that support industry, etc. Today, there are restaurants, large supermarkets, shops and more in what was once the heavy industrial area. Municipal policy aims to attract more commercial uses, including entertainment and recreational facilities, to this area. However, with no clear planning agenda governing the area's physical and environmental development, the city is not fulfilling its potential – that is, to become an attractive, prosperous city and a leader in industrial innovation.

1.3. Policy Initiatives Associated with the City's Industrial Sector

There are numerous initiatives associated with the city's industrial sector, ranging from industrial development to technical education and marketing and branding. Nonetheless, there is a lack of coordination among the different offices in the city administration and there is not a coherent vision for the development of Ashdod's industrial sector and industrial land. The main conclusions of an analysis of Ashdod's policy initiatives are as follows:

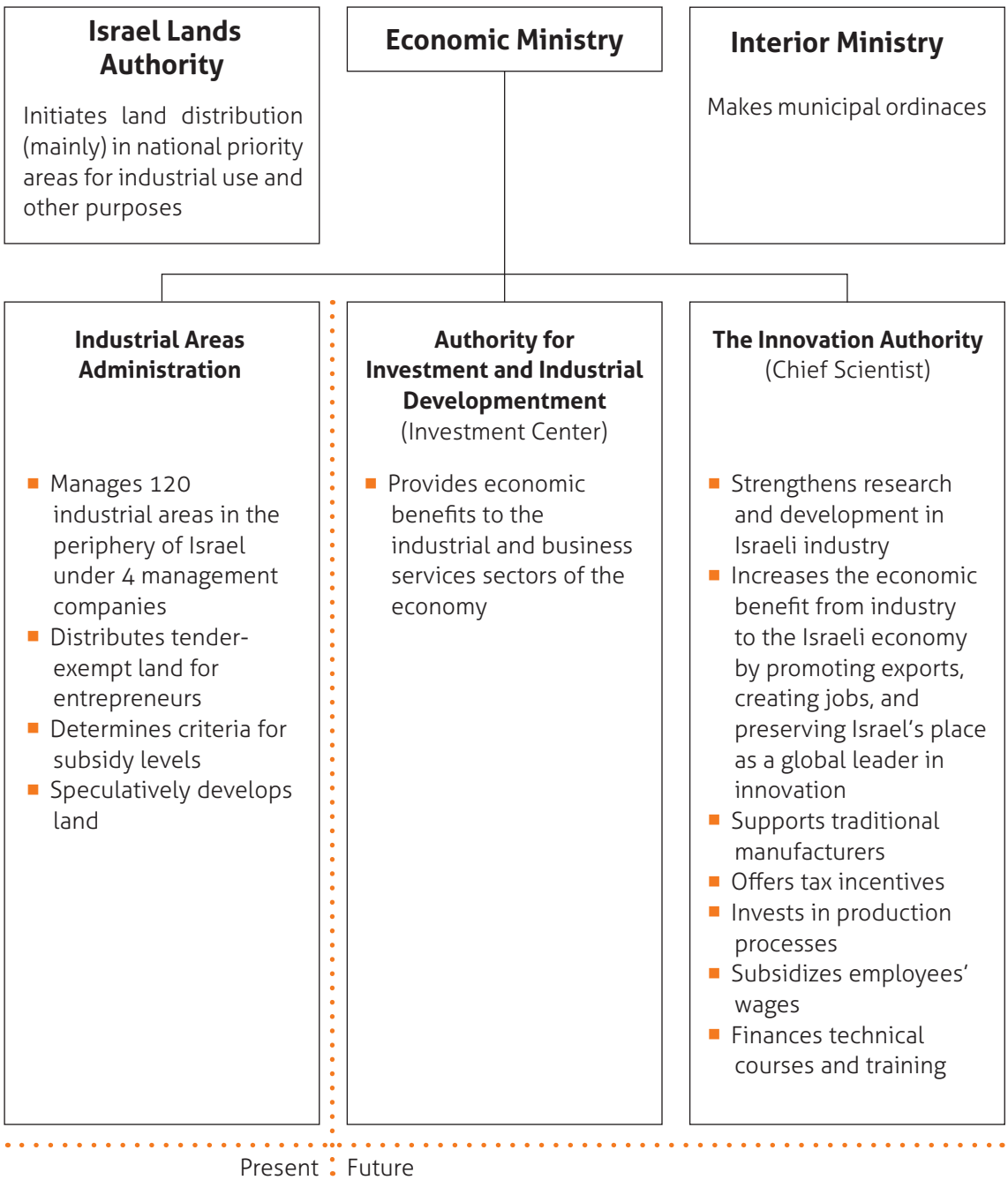
- **The city lacks an agenda for traditional manufacturing.** Despite the multitude of agencies addressing the industrial zones, no one agency within the city administration deals directly with traditional industry, at least not clearly or in line with the scale of industry in the city and region and its economic impact on the city. The Industry Development Division promotes many initiatives related to entrepreneurship development and innovation. There are initiatives to develop a high-tech park, to develop a new port, to encourage technological and scientific studies, and to establish future research institutes at the Assuta Ashdod University Hospital and Alta. However, alongside these initiatives, there is a significant absence of attention to industry in general and traditional industry in particular. The Operations Management Division deals mainly with the day-to-day operations of the industrial areas, including monitoring deficiencies, garbage removal, supervision and contact with business owners. In other words, their role is to monitor and address problems that arise in the normal

course of daily operations. Without a budget and practical tools, this department is merely a supervisory arm. These bodies, with their distinct roles, have a very loose (if any) link. Each department recognizes the existence and activities of the other, but no attempt is made to exchange information, to develop joint programs, or at the very least to help one another. In this context, it is important to note the rank and power of each body: the Industry Development Division is perceived as being elitist and oriented toward high-tech industries and entrepreneurship, while the Operations Management Division is perceived as inferior and limited in its ability to wield influence by its lack of power and resources.

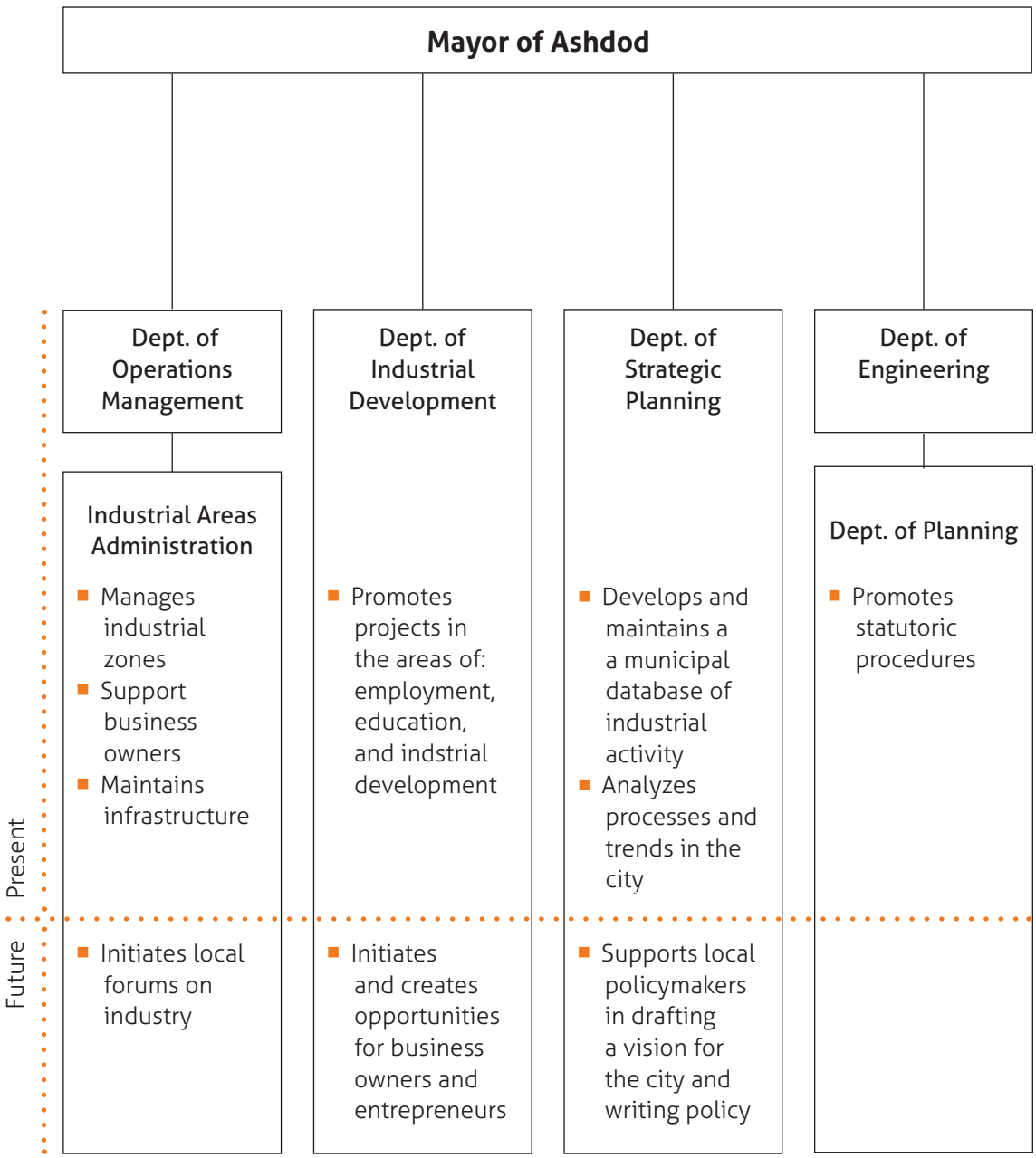
- **The city's policies are "jumpy" with regard to job training and to tracks for integration into the labor market.** In addition to the Municipal Employment Center, there are a number of distinct tracks tailored to specific populations: ultra-Orthodox, immigrants, youth at risk, populations with disabilities, and so on. Most of the initiatives are the work of entities not directly related to the city administration. It seems that the main purpose of all these initiatives is to reduce unemployment. In addition, a limited attempt has been made to create a strategic plan for increasing employment in the city's industrial sector. A coherent and coordinated plan could develop a comprehensive initiative that combines various programs and aids diverse groups (with the necessary adjustments) with the goal of cultivating a diverse, economically stable community through integration into the industrial sector. If the city does not establish an industry-oriented educational framework, the desired result will not be achieved in terms of industrial development and economic resiliency as well as local pride.

- **Urban planning and economic development initiatives ignore industry.** Improvements in public transportation, the opening of accelerators for entrepreneurship and innovation, agreements with the national government, planning and building regulations, and higher education institutions can each act as an impetus for improving and changing the industrial areas in the city in general and the heavy and light industrial areas in particular. However, there is no comprehensive plan for the industrial zones. Therefore, at present, the opportunity to link these varied improvements and assets to improvements to and/or the evolution of the industrial zones is lost.

Key Governmental Offices and Responsibilities



Organizational charts from Benyamin, Ran and Pragier, Einat, in *An Analysis of the Industrial Areas in Ashdod: Physical, Social, and Administrative Dimensions*, 2017 (http://www.industrialurbanism.com/report-ashdod-1)


Mayor of Ashdod
Dept. of Operations Management
Dept. of Industrial Development
Dept. of Strategic Planning
Dept. of Engineering
Industrial Areas Administration
Manages industrial zones
Support business owners
Maintains infrastructure
Promotes projects in the areas of: employment, education, and indstrial development
Develops and maintains a a municipal database of industrial activity
Analyzes processes and trends in the city
Dept. of Planning
Promotes statutoric procedures
Present
Future
Initiates local forums on industry
Initiates and creates opportunities for business owners and entrepreneurs
Supports local policymakers in drafting a vision for the city and writing policy

Global and Local Initiatives and Policies

Global Initiatives and Policies

General Initiatives

- Encourage local procurement by promoting partnerships between suppliers and manufacturers
- Organize events to mentor and assit entrepreneurs (e.g., the Hack-a-thon)

Specific Projects

- **The Hive**
  A start-up accelerator
- **The Kitchen**
  An initiative of the Strauss Group; an incubator for inventions at the intersection of food production and technology
- **We Work**
  A company that operates in many places around the world and in Israel, which lets out offices by the hour or day, allowing small business owners and freelancers to work or hold meetings in a respectable place

Strategies

- **MIT REAP***
  A program that promotes international relations for economic growth
  *Regional Entrepreneurship Acceleration Program
- **ReWay**
  A general program to upgrade the urban environment and infrastructure through transportation improvements
- **A Strategic Plan**
  (for Ashdod's Industrial Areas), a collaborative project between the faculty and students of Tel Aviv University and MIT.

Organizational charts from Benyamin, Ran and Pragier, Einat, in *An Analysis of the Industrial Areas in Ashdod: Physical, Social, and Administrative Dimensions*, 2017 (http://www.industrialurbanism.com/report-ashdod-1)

Local Initiatives and Policies

Training

- **Municipal Employment Center**
1. A rehabilitation program that prepares those with intellectual developmental disabilities for work (*Ma'as*)
2. A program for the integration of a group of disabled people into manufacturing facilities (*Ma'as*)

- **Labor Ministry**
A training factory where employers may hold courses

- **Economic Ministry**
Training programs and grants to promote entrepreneurship and to assist small and medium-sized businesses (*Maa'of*)

Employment

- **Municipal Employment Center**
1. **Strive**, seeks new career paths for young, unemployed Israelis with a low-level of education
2. **Ramp**, promotes the employment of young, diabled people
3. **Leap**, seeks employment for at-risk youths (ages 18 - 25)
4. **Employment Orientation of the Dept. of Absorption**, for immigrants making *Aliyah* (up to 10 years after arrival)
5. **Directions**, Youth Guidance Center
6. **Distance Plan**, for immigrants making *Aliyah* from Ethiopia (ages 18-45)

- **Employment Service Office**
For people outside of the labor force

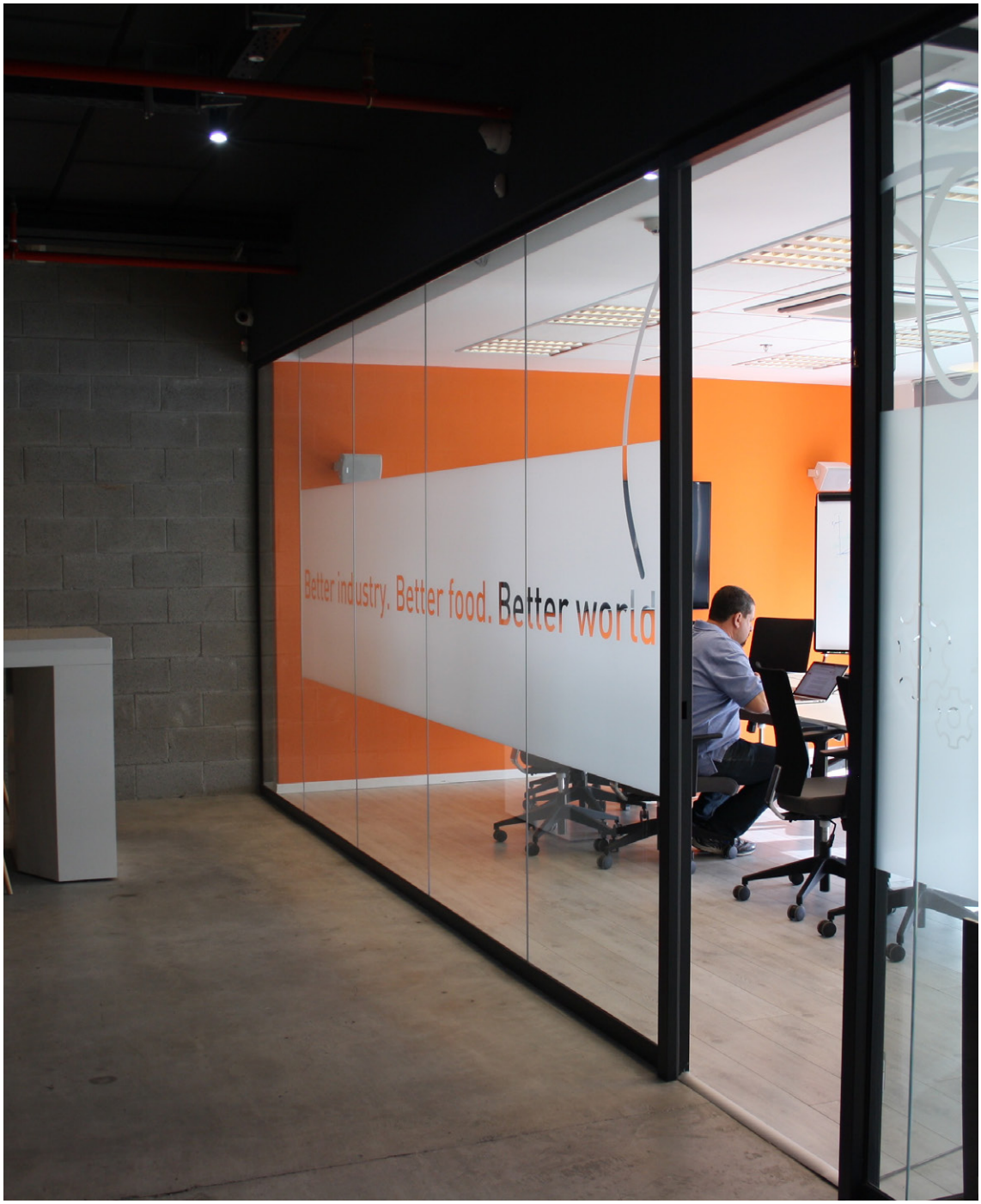
- **The Mapach**
A development center for the Haredi commuity

- **Women in Business Initiatives**

Education

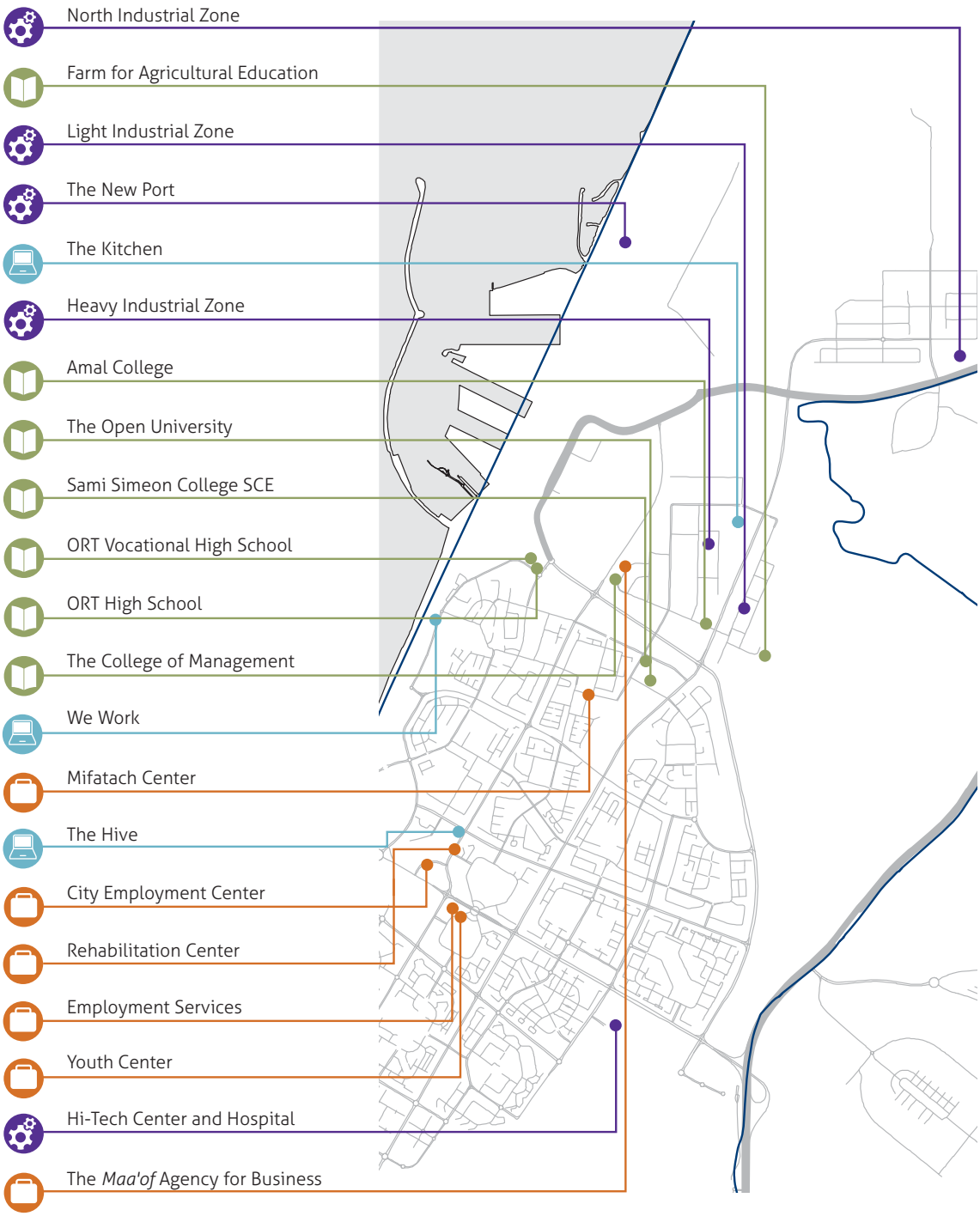
- **Academic Education**
1. **Sami Simeon College SCE**, The Academic College of Engineering is the largest academic institution in Israel in the fields of software engineering; mechanical, structural, and electrical engineering; electronic engineering; chemical engineering; and industrial engineering and management
2. **The College of Management**, trains professionals in the fields of practical engineering; management; accounting; and technological professions
3. **The Open University**, offers a variety of degrees in relevant fields
4. **Accomplishments**, offers courses supervised by the Ministry of Economy; offers technical courses and vocational training

- **High School Education**
1. An initiative that encourages students to become math teachers
2. **ORT Marine**; A maritime vocational school for students (ages 17-18)



The Kitchen, an incubator for inventions at the intersection of food production and technology | *Zoë Taft Mueller*

Locations of Institutions and Places Associated with Ashdod's Industrial Sector



Map from Benyamin, Ran and Pragier, Einat, in *An Analysis of the Industrial Areas in Ashdod: Physical, Social, and Administrative Dimensions*, 2017 (http://www.industrialurbanism.com/report-ashdod-1)

1.4. Ashdod Master Plan: Central Ideas and its Vision for Industry

The master plan for Ashdod inherits the city planners and policymakers' lackadaisical approach to the city's industrial areas. Although it puts forward a highly developed plan for the city's residential areas and city core, it hardly offers any vision for the city's industrial areas, with the exception of allocating additional land for industrial use. The subsequent pages briefly present the city's existing conditions, followed by the key principles put forward by the master plan.

■ Existing conditions

Land Use. The Lachish Stream separates the northern industrial areas, including the areas with a high number of facilities that emit pollutants (chlorine, sulfur dioxide, etc.), from the residential quarters and commercial and leisure areas. This means that the stream and its surrounding park, an important piece of Ashdod's imagined "green belt," are very close to polluting uses.

Circulation. There are two points where Route 4 (the north-south coastal artery) may be accessed - one in the north and one in the center. This means that there is very heavy truck traffic between Route 4 and the northern industrial areas. Three new access roads have been proposed. A BRT is under construction and bicycling lanes are to be extended throughout the city, but the proposed and under construction BRT routes and bicycling lanes only touch the peripheries of the industrial areas.

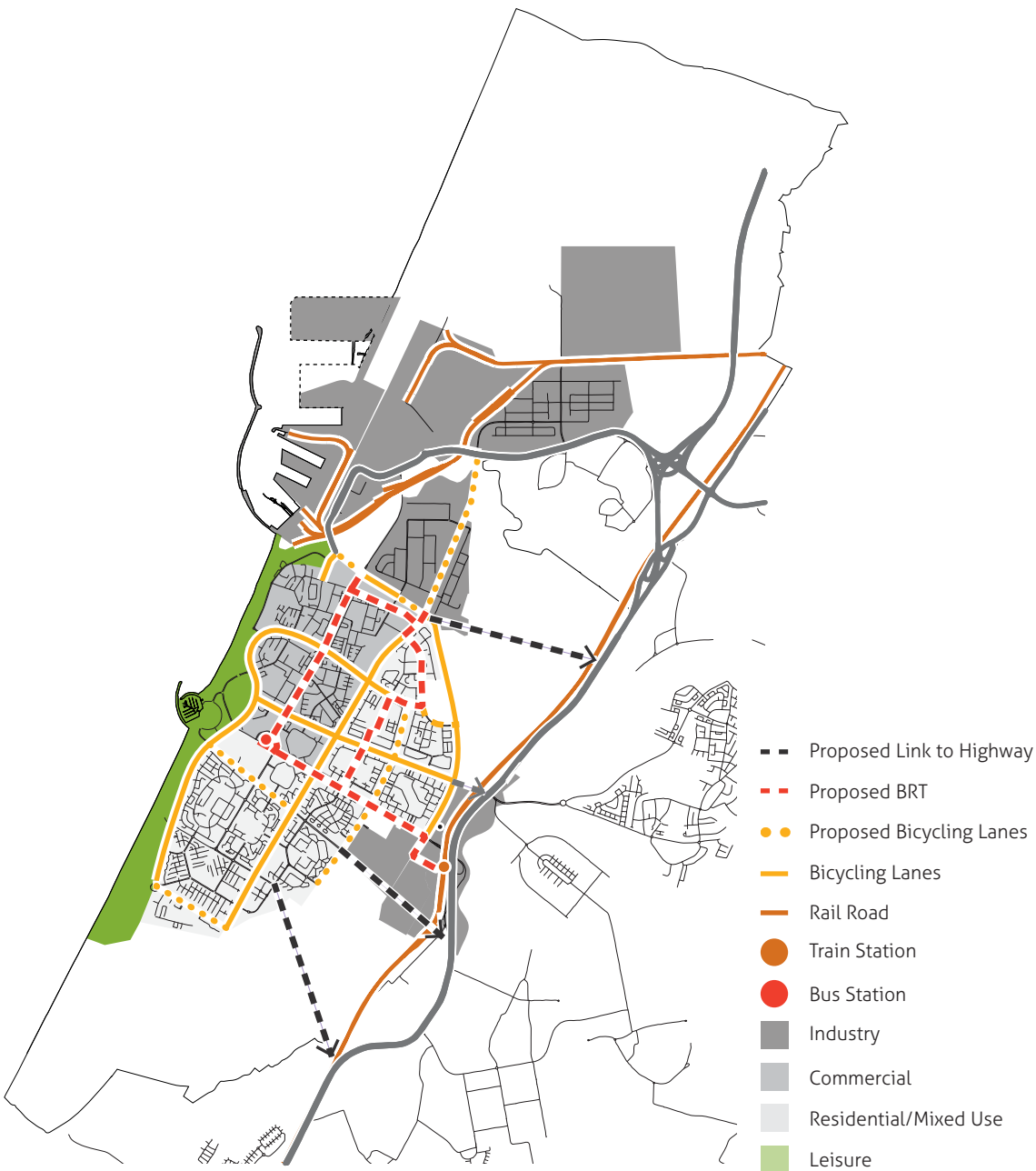
Natural Landscape. Ashdod's beach connects to a large coastal park/reserve to the city's south, made up of dunes, scrub, and some wooded areas. The Lachish Stream flows northward from Kiryat Gat, and continues around the city's eastern edge before curving westward near the northern and heavy industrial areas and spilling into the sea. Route 4 separates the city and the preserved open space to the city's south from nearby farms.

Topography and Hydrology. Ashdod is hilly. Its topography constrains development in some areas but also offers excellent views of the sea, the port, and the city's industrial areas.

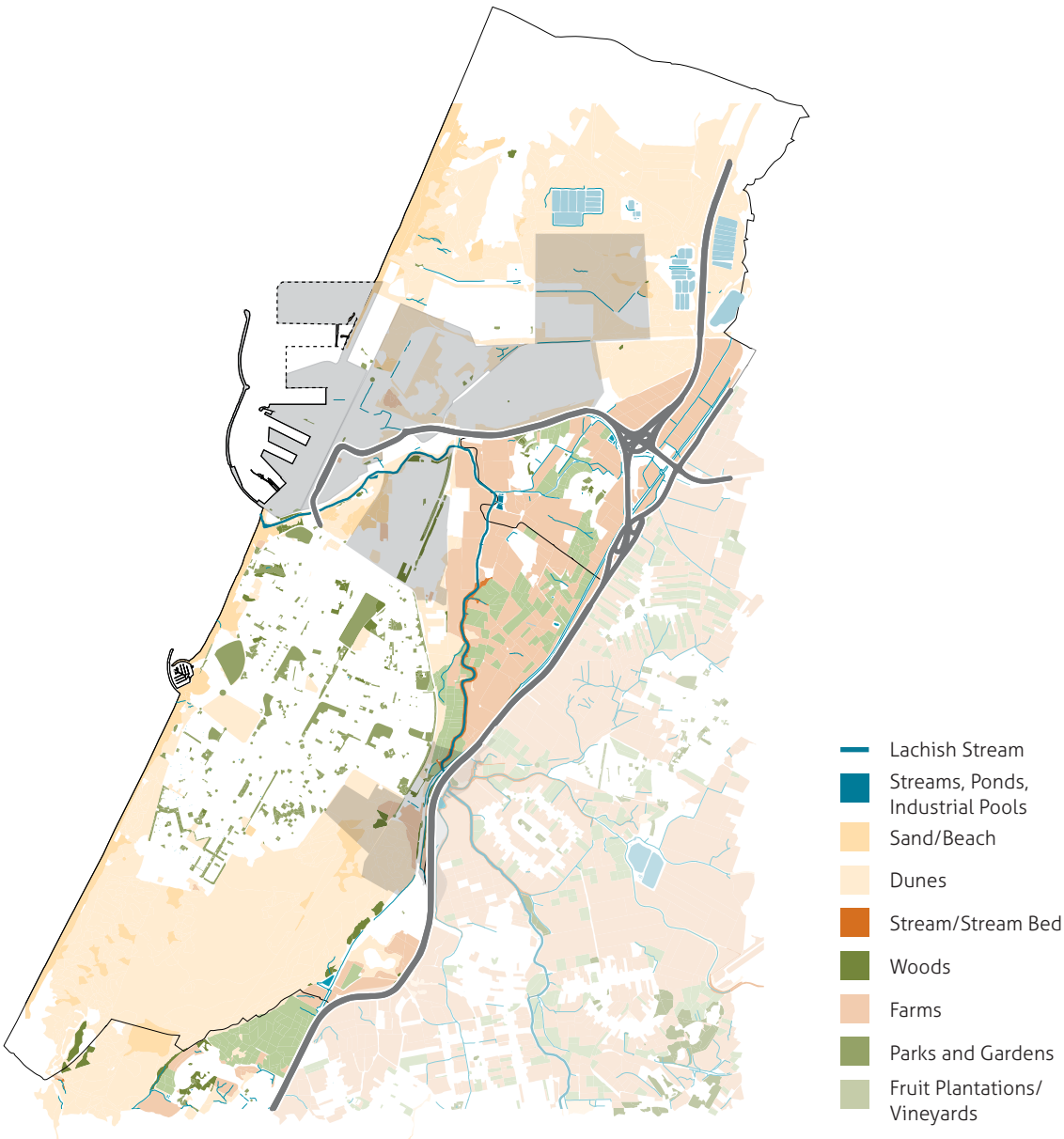
Green Areas: Parks, Gardens, and Woods. Ashdod has a number of parks - Lachish-Ashdod Park, Ben Gurion Park, Ashdod-Yam Park, the Elisheva Garden, and Giv'at Yonah Garden - and each of its residential quarters have gardens. Although gardens were purposefully included in each residential quarter, gardens or parks have not been planned for the city's industrial areas.

ReWay, a transportation improvement program | *Max Moinian*

Weekly Market along the Beach | *Zoe Taft Mueller*



Existing Conditions | Land Use and Circulation



Existing Conditions | Landscape

■ **Vision: A City for Everyone.**
The plan is based on four key principles:

(1) Re-orienting the city toward the Sea. The city opens toward the sea. The Lachish Stream and the dunes (to the south) reinforce this orientation. The city takes its place as an important piece of the chain of cities and seaports around the Mediterranean Sea.

(2) Enhancing connectivity. Linked at the local, regional, and national scales. The city takes advantage of its proximity to central and southern Israel.

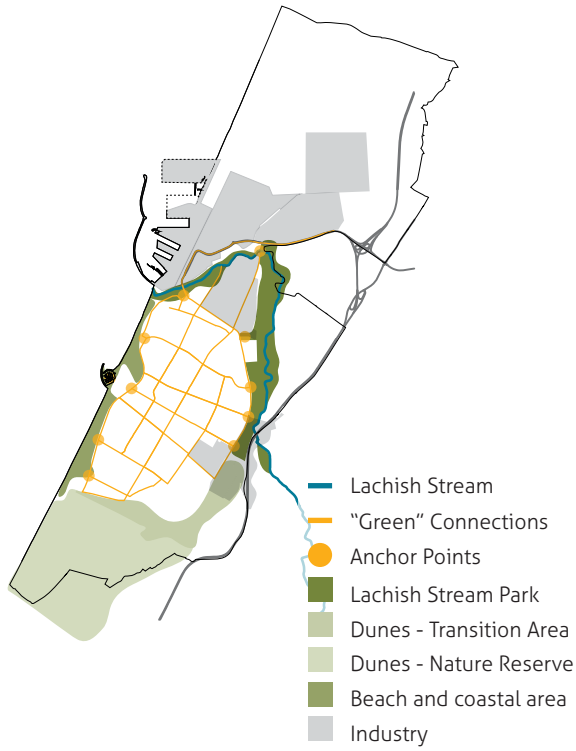
(3) Fostering sustainability. Promotes high-quality sustainable development and urban regeneration with special attention to local identity and heritage.

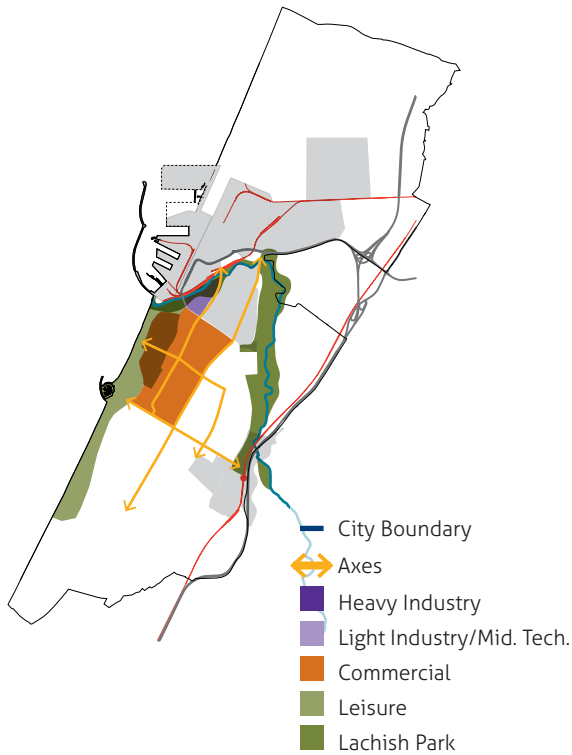
(4) Encouraging urbanity. Encourages agglomeration and offers a variety of options as the basis for a high-quality urban lifestyle for individuals, communities and the public. Uses public spaces to encourage human activity, civic interaction, and involvement.

The plan is based on the following key physical planning principles:

1. Developing the seashore as a significant and dynamic public space;
2. Developing the "green belt" as a continuous circle of public open space around Ashdod;
3. Renewing Ashdod's older quarters;
4. Developing the transportation network by adding a new northern access road; encouraging public transit use and non-motorized forms of transit;
5. Planning, enhancing, and highlighting Ashdod's public spaces.

With regard to the development of Ashdod's industrial areas, the master plan's approach

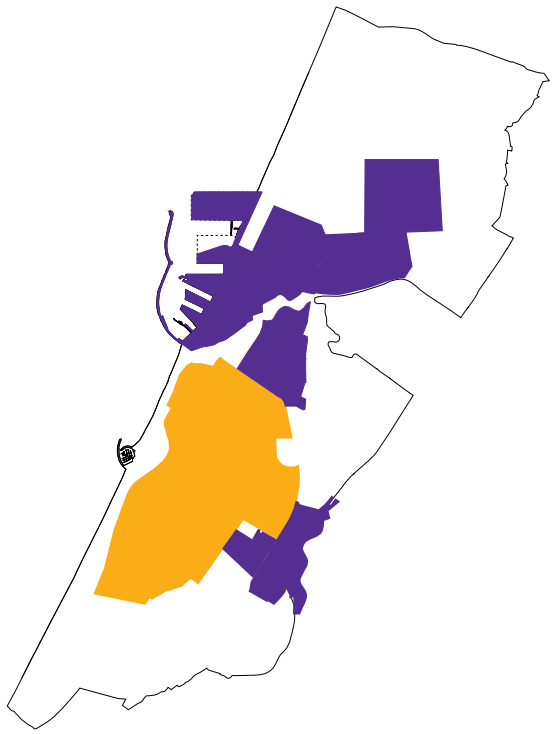




is "business as usual;" it does not offer a new vision for either the development of the industrial areas in the city or particular areas.

1.5. Conclusions: The Future of Ashdod's Industrial Areas

Ashdod has an enviable geographical position, infrastructure of national importance, and varied planning and policy initiatives that are improving the city's physical condition, aiding unemployed minority groups, and attracting entrepreneurs and innovators. Nevertheless, the city lacks a vision that integrates the aforementioned first-rate attributes and resources with the city's industrial sector. Today, cities cannot merely set aside land for factories. There is too much competition; it is easy for other cities to convince a successful enterprise to relocate. To be a leader in industrial innovation and to be a dominant force in the Israeli economy, Ashdod must have a holistic, systematic, and integrated vision for the city in its entirety – the city's industrial sector and its industrial areas must be tied into the wider economy and city, both physically and programmatically. This requires a high-degree of seamless coordination and collaboration.



Industrial Areas versus Residential Areas

Railroad Tracks and the Lachish Stream: the Dividing Line between the Northern Industrial Areas and the Wider City
Max Moinian


רח' המתכת
HAMATECHET

2 Developing a Framework for Ashdod's Industrial Areas

2. Developing a Framework for Ashdod's Industrial Areas

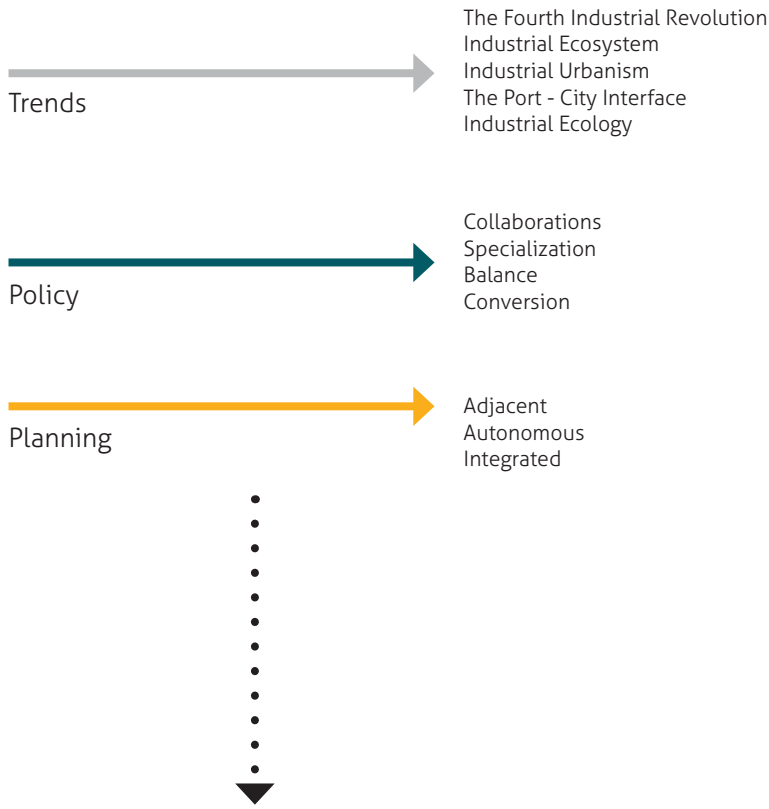
2.1. From a Parallel Process to an Integrated Process

Today, in the milieu of the 'Fourth Industrial Revolution'– a term that signals the dramatic ways in which technologies at the intersection of the digital and the physical are changing manufacturing (Reynolds, 2017; Schwab, 2015) – policy debate focuses on the importance of manufacturing to local, regional, and national economies, and asserts that manufacturing remains vital to economic and social resiliency and to continued economic growth. There is, therefore, a strong interest in the question of how technological evolution might create opportunities for regions to grow their manufacturing sectors, which had been shrinking at a rapid rate for the last half century or longer, and, in turn, create new manufacturing jobs (Pisano and Shih, 2012; Plant, 2014).

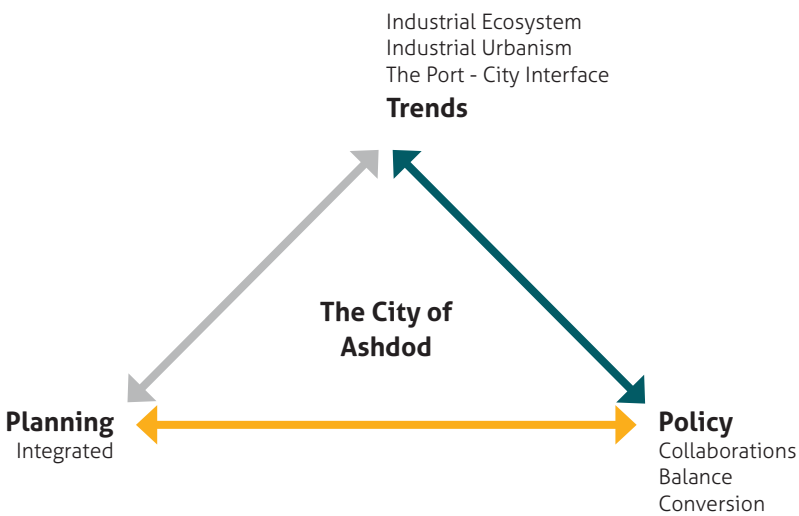
This strategic plan is based in part on two linked assumptions: (1) a consensus on the importance of manufacturing to metropolitan areas' economic robustness and growth has emerged, and (2) building metropolitan areas' manufacturing sectors necessitates regional policy and physical planning strategies. Although economic development strategies and policies almost always affect social and demographic dynamics and the physical characteristics of urban and rural areas, most strategies, policies, and even government-supported industrial developments restrict their focus to the intangible (e.g., tax incentives, recruitment of firms or national R&D assets).

This strategic plan suggests that there might be a better way to respond to current and emerging trends. That is, industrial development should be based on an integrated policy-planning framework. In the following, we will outline the (1) trends in industrial planning and development and (2) trends in policy.

Existing Process: Parallel Efforts



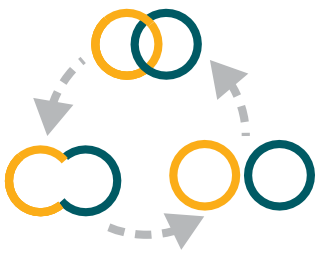
Future Process: An Integrated Effort



2.2. Trends: Key Themes

What are the important trends that are changing industrial development patterns? This section identifies current trends in manufacturing and in the planning and development of industrial areas. This section discusses how each of these trends affects the physical form of the city, its economy, its people, and its environment as well as the challenges each trend raises. This section concludes with important takeaways applicable to the City of Ashdod.

The Fourth Industrial Revolution



Space

The organization of space is meant to encourage fusion – collaborations or crossovers in learning and knowledge transfer between different types of manufacturers. The goal is to encourage the development of new intersectional technologies or products.

Economy

The Fourth Industrial Revolution "is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres" (Schwab, 2015). Changes include the evolution of (1) artificial intelligence, (2) digital fabrication technologies and the use of these in biotechnology, and (3) technologies at the intersection of "computational design, additive manufacturing, materials engineering, and synthetic biology" (Schwab, 2015).

Challenges:

Traditional manufacturing remains vital to cities' economies. City leaders must strike the appropriate balance between courting advanced manufacturers and traditional manufacturers.

Society

Progress belies problems: many may be left out. Even today, there is "a strong demand at the high and low ends, but a hollowing out of the middle" (Schwab, 2015).

Environment

How manufacturers use land and how much of it they use might change. The invention of new production processes, like digital manufacturing, will alter factories' building typologies and site requirements. Also, there has been a proliferation of small-scale, custom manufacturers.

Industrial Ecosystem

Space

The organization of space is meant to cultivate relationships and exchanges. This may be done by developing the "clusters" within an area. Clusters consist of firms that may be grouped by product, and they include firms that participate in the production of a product at different points in its production (e.g., up and down the supply chain). It may also be done by setting aside land for industrial use adjacent to academic institutions or by subsidizing step-up spaces for emerging manufacturers near established manufacturers.

Economy

The industrial ecosystem concept views the region and its manufacturers as a system and aims to encourage innovation and, in turn, growth through the collaboration of manufacturers, educational institutions (especially universities), and governmental agencies/organizations (Etzkowitz, 2012). This concept emphasizes the relationships between high-tech and low-tech manufacturers and sees manufacturer diversity as an important, if not central, component of the system (Hansen and Winther, 2011).

Challenges:

Major research universities have led successful efforts to collaborate across sectors in a number of cities that might be said to have an industrial ecosystem. Without the leadership of a university, a government office must take the lead.

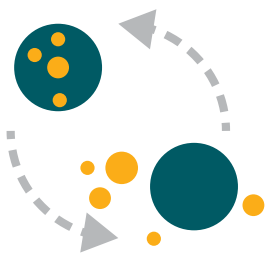
Society

Relationships are the building blocks of this concept. These include the following: (1) Cross-sector relationships between academia and industry, government and academia, and government and industry; (2) cross-scale relationships between entrepreneurs and established firms or small and medium firms and large firms; and (3) up- and down-stream relationships between suppliers and producers.

Environment

Some industrial clusters affect the environment more than others. Clean up efforts may be more successful if the responsibility for environmental remediation is shared across a cluster.

Industrial Urbanism



Space

Technological evolution is altering manufacturing's physical footprint, distribution processes and networks, access to transportation, and preferred geographical locations. The organization of space is based on the idea that an urban location confers a competitive advantage due to access to people, educational institutions (center of research and experimentation), and customers.

Economy

Demand for industrial land within cities, especially near academic institutions, is becoming more valuable to manufacturers, including knowledge-intensive manufacturers, because an urban location confers a competitive advantage due to access to people, educational institutions (center of research and experimentation), and customers. At the same time, however, the demand for land for residential and commercial uses within cities is also increasing.

Challenges:

Zoning codes have aimed to separate industrial uses from other uses for more than a century. This has shaped public expectations and the public perception of industry. The public must be persuaded, convinced of the merits of mixing non-industrial and industrial uses.

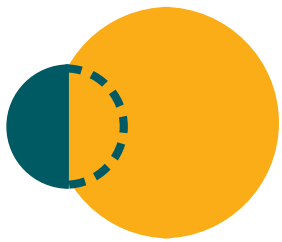
Society

Technological change "will empower small and medium-sized firms and individual entrepreneurs" (Markillie, 2012: n. pg.). Scholars project that economies of scale, which favor large manufacturers with global reach, will be less important in the future because manufacturers' primary costs will be for machine tools (Markillie, 2012). Moreover, additive manufacturing and the use of artificial intelligence will dramatically reduce manufacturers' labor costs (Markillie, 2012; Schwab, 2015).

Environment

Industrial urbanism, which refers to typologies in which industrial areas are integrated into the city or adjacent to the city, offers an alternative to the autonomous industrial park. While this typology will remain common due to the lower cost of ex-urban and suburban land, it wastes rural land and wilderness by contributing to ex-urban and suburban sprawl.

The Port-City Interface



Space

One type of spatial port-city intervention reconfigures an active port based on technical, industrial and urban needs (e.g., housing). Examples include Rotterdam and Genoa. Goals that may structure the organization of the space include (1) compatibility, (2) coexistence, and (3) the symbiosis between the port and the urban economy (Sánchez, 2016; Vries, 2014).

Economy

Goals include the retention of jobs for low-skilled workers and the attraction of knowledge-intensive firms and high-skilled workers.

Challenges:

There may be competition for land where the port and the city meet, especially when there is demand for container storage space and more residential units.

Society

The public often has a negative perception of port areas. Rethinking and redesigning the port-city interface is meant to change this and to enliven the interface by developing dynamic port-urban interactions.

Environment

This concept often involves the remediation of brownfield sites and the addition of landscaping for recreational and aesthetic purposes.

Industrial Ecology

Challenges:

Loops work best when established through bilateral agreements between firms in response to particular needs.

Space

The organization of the space (e.g., an industrial park) is based on environmental considerations, especially the following goals: sustainability, energy efficiency, and waste reduction.

Economy

Increasing efficiency and becoming more sustainable, especially through waste reduction and reuse, are seen as important cost-saving measures.

Society

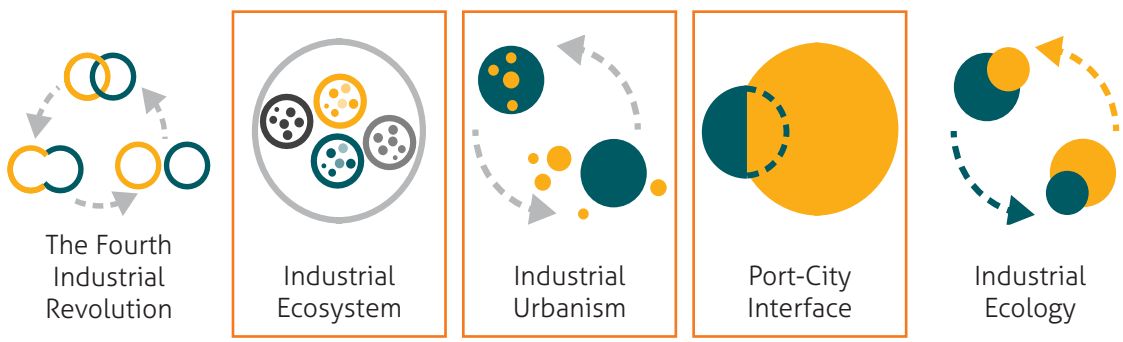
This idea may be used as a branding strategy to influence public perception and opinion. Increasingly, the public favors companies and developments that are environmentally conscious and responsible stewards of natural resources.

Environment

Industrial ecology refers to the practice of reducing industrial waste by establishing a loop in which one manufacturer uses the by-products of another, and so on. Eco-industrial parks are typically autonomous industrial parks that are committed to this practice in principle and to other environmentally conscious practices (e.g., green building technology, solar power generation/use of solar power, energy-efficiency).

Trends: Recommendations for Ashdod

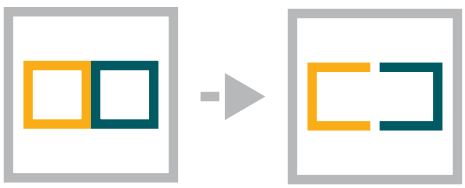
Of these trends, the most relevant are the trends toward building an industrial ecosystem, designing the port-city interface, and cultivating industrial urbanism. Responding to the concept of an industrial ecosystem might help guide the development of the northern industrial area. Reconsidering the port in the context of the trend toward designing the interface between the port and the city might change the port's public image and might open up new opportunities for the port authority. Looking at other industrial areas in the context of the trend toward cultivating industrial urbanism might transform these areas into varied, lively live-work communities.



2.3 Policy: Potential Strategies

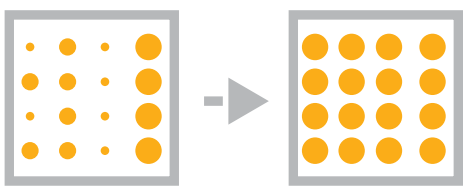
Although it is impossible to list all policies, which are clearly embedded in local political and economic contexts, it is possible to identify common strategies through their underlying intentions and goals. In categorizing strategies through their declared goals, one can find four types of strategies and related policies: Collaborations, Specialization, Balance, and Conversion, as follows.

Collaborations



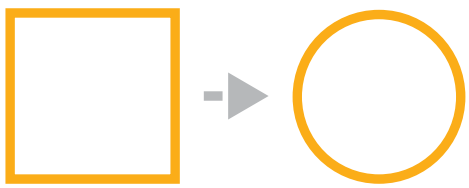
A regional innovation strategy is synonymous with idea of cultivating an industrial ecosystem. This strategy emphasizes external or cross-firm, industry, and sector collaborations as a means to catalyze innovation and, in turn, growth. This strategy is meant to be implemented at a region or metropolitan area scale.

Balance



A cluster development strategy comprises initiatives that aim to stimulate regional economic growth by identifying and further developing the clusters that are anchored in a select metropolitan area (Burfitt and MacNeill, 2008; Wolman and Hincapie, 2014; see also The U.S. Cluster Mapping Project). The basic idea is to reinforce and further develop expertise and excellence in the manufacturing of select products. Ideally, the region will become a renowned hub for the production of these products.

Conversion



A regional development strategy aims to encourage the even spatial distribution of industry throughout a region through various policies. This includes policies that provide incentives to invest in metropolitan areas' poorer areas – poor, here, referring both to prevailing socio-economic conditions and the condition or lack of industrial assets and infrastructure.

Specialization

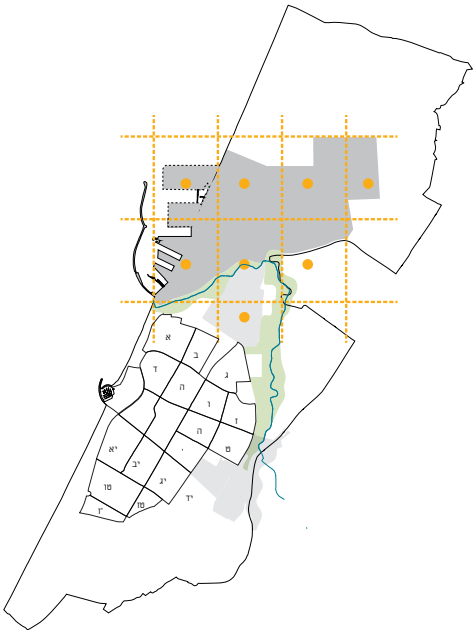
A strategy of industrial conversion aims to convert industrial resources (e.g., land, facilities) within a region from one purpose (e.g., steel production) to another (e.g., the manufacturer of aeronautics) or to the production of many different products.

Polices: Recommendations for Ashdod

Ashdod has several assets that distinguish it from other Israeli cities – the Port of Ashdod, the Israeli Electric Company Eshkol power plant, the Paz oil refinery, and the new Assuta Ashdod University Hospital, to name a few – and has a diverse mix of businesses engaged in manufacturing, metal recycling and metalworking, the provision of construction services, and the production of direct-to-consumer products (e.g., custom surfboards). At the same time, Ashdod has a number of vacant or underutilized buildings and lots, especially between the Lachish Stream and the city's residential quarters. Therefore, we suggest the pursuit of policies that fall under one of three strategic umbrellas: Collaborations, Balance, and Conversion. Ashdod's asset wealth is an excellent foundation upon which to build a network of exchanges and collaborations across firms, industries, and sectors to stimulate research, innovation, and growth. At present, Ashdod's industrial areas are on the city's northern periphery. New manufacturing practices – advanced manufacturing – and the construction of a new development anchored by the Assuta Ashdod University Hospital and the Ashdod Ad Halom railway station offer an opportunity to more evenly distribute industrial activity and high-quality places of employment across the city. The area between the Lachish Stream and the city's residential areas is a particularly lively and thriving part of the city, but there are numerous vacant or underutilized buildings and lots (especially buildings' second stories). This is one area, among others, that would benefit from active intervention in the form of policies that incentivize conversion. Likewise, in the back-of-the-port area, policies that propel it toward conversion into an advanced logistics center area are sorely needed.

2.4 Structure: Spatial Alternatives

Although policies that aim to support and expand cities' manufacturing sectors are often formulated without regard to cities' physical development and are even seen as wholly separate initiatives, history indicates that there is a clear relationship between these policies and the evolution of the form of the city and its region, and vice versa. Substandard physical planning will impede and inhibit well-formulated policies to support and expand manufacturing. There are four possible spatial strategies that the City of Ashdod may follow to further develop its industrial areas.



1 Industrial Quarters

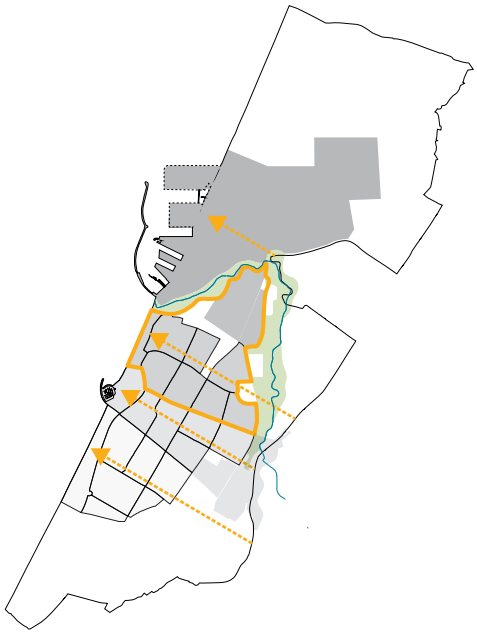
Ashdod's residential areas are divided into quarters (Alef, Bet, Gimel, etc.). These quarters have four things in common: 1) adjacent streets acting as clear boundaries; 2) a well-defined core, either an amenity or an open space; 3) an internal secondary circulation network; and 4) a particular architectural style and identity. This strategy proposes extending this spatial ordering to the industrial areas.

2 Stitching the Dual City

Presently, Ashdod is divided into two parts: the industrial areas in the north and the city center and residential areas in the center and south. This strategy proposes connecting these distinct parts through interventions along the city's two main north-south axes, Sderot Herzl and Sderot Bnei Brit. Interventions might include mixed-use developments at higher densities or landscape spaces. This strategy also suggests using these main axes to structure environmental policy and regulations; thus, from south to north, there would be a gradient of allowed noises, emissions, and other hazards.

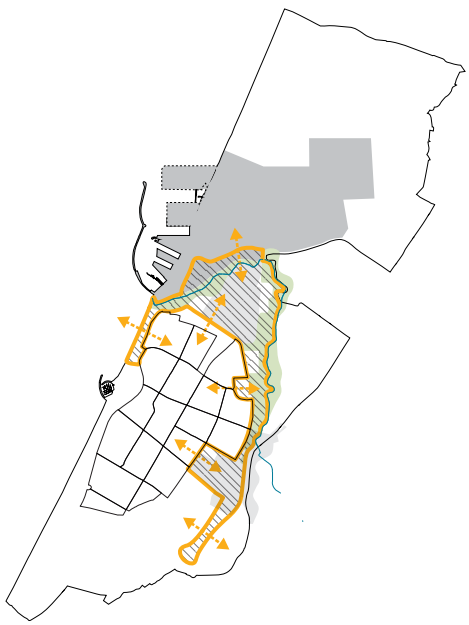
* These diagrams were adapted from students' diagrams representing their initial understanding of the City of Ashdod. Students developed these representations during a 10-day workshop in Ashdod. For further information see http://www.industrialurbanism.com/ashdod.

1) Adapted from the work of Carlos A Sainz Caccia, Einat Pragier, and Zixiao Yin; 2) Adapted from the work of Efrat Bramli, Louis Liss, and Zoë Taft Mueller



3 LiveWork Ashdod

This strategy proposes 1) moving away from the quarter structuring system, viewing the city as a series of four larger districts, and developing it as such, 2) focusing attention on Ashdod's beach instead of the north or the south, and 3) developing a new district south of the Lachish River and north of the city center as a dynamic live-work district.



4 A City-Industry Ring

This approach to structuring Ashdod builds on the ring of parks, gardens, and natural areas surrounding Ashdod and the diversity of industry on Ashdod's periphery while recognizing that Ashdod's population center is in the central and southern parts of the city. It suggests the development of a dynamic transition zone, a city-industry ring where select industrial uses coexist and mingle with commercial uses and the landscape. The ring might be segmented thematically into a sea- and tourism-oriented segment, a light industry and workshop segment, an agricultural and logistics segment, and a research and advanced manufacturing segment. This ring would connect the disparate parts of the city.

3) Adapted from the work of Ran Benyamin, Max Moinian, and Kfir Noy; 4) Adapted from the work of Ayelet Bar Ilan., Max Budovitch, and Yulia Furshik

Structure: Recommendations for Ashdod

We suggest extending the organization of Ashdod's residential areas – the quarter model – to its industrial areas. This model is the basis on which the wider city was constructed; it is familiar. It is readily understood not only by the city administration but also by the city's residents, and visitors are quick to apprehend it. Adopting this model implies restructuring and re-naming the industrial areas. Physically, this model is based on a few distinctive features: first, clear boundaries, second, an amenity-rich core, third, a secondary circulation network, and fourth, an evident architectural language that will establish a distinctive environment that businesses may draw on to build their brands. In each quarter, we suggest developing a center that offers a range of services specially tailored to address the day-to-day and long-term needs of the businesses within the quarter – something essential to attracting and growing businesses and to keeping successful businesses in Ashdod.

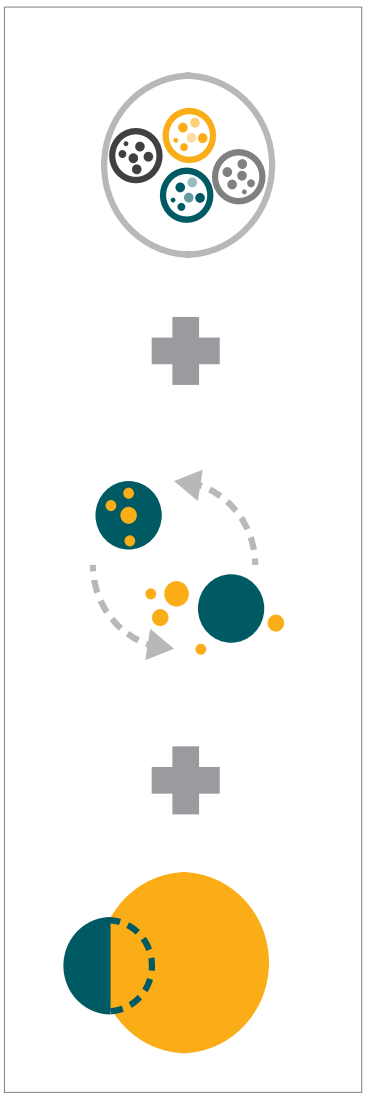
2.5. Suggested Framework for Industrial Area Development

Mapping the triangle of (1) trends in manufacturing and industrial planning and development, (2) common policy strategies, and (3) physical planning strategies for the city's industrial areas and their integration into the wider city suggests that while inventions, innovations, and intangible and tangible initiatives in each of these areas greatly influence one another, they are undertaken in parallel, like lines that never cross. With regard to the industrial sector, the current trends in manufacturing are altering manufacturers' calculations with regard to site selection. Proximity to suppliers and markets, the city center and its varied resources, and residential areas is increasingly important. Community is also seen as a core resource. The increasing importance of these factors has made flexible and innovative land use regulations and building codes highly desirable.

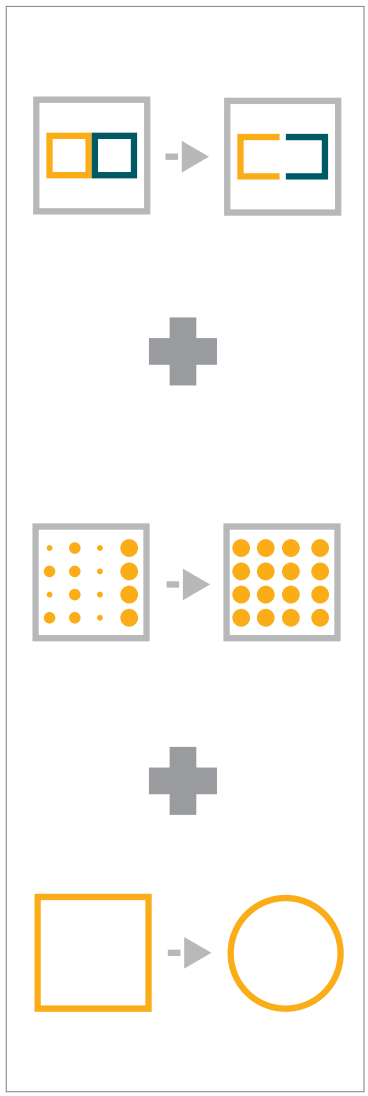
To be sure, Ashdod is well positioned to take advantage of these dynamics. Nevertheless, while more than 50% of its area is designated for industry, it has no comprehensive strategic plan for its future development. To date, trends and policy do sometimes intersect, especially through economic development strategies that aim to cultivate cross-sector collaborations and partnerships and to reinforce and further develop metropolitan areas' unique industrial specializations. Planning – the making of physical plans – is neither propelling nor shaping nor influencing these trends, nor is it offering new spatial models that might influence strategic thinking about economic development and resiliency.

Thus, if Ashdod aspires to develop its industrial areas in a way that looks toward the mid-to-late 21st century and enhances its economic robustness and resiliency, it must adopt a new way of thinking about the relationship between the city and its industrial sector. It also must develop a framework that integrates a response to trends in manufacturing and industrial planning and development, policies, and physical planning.

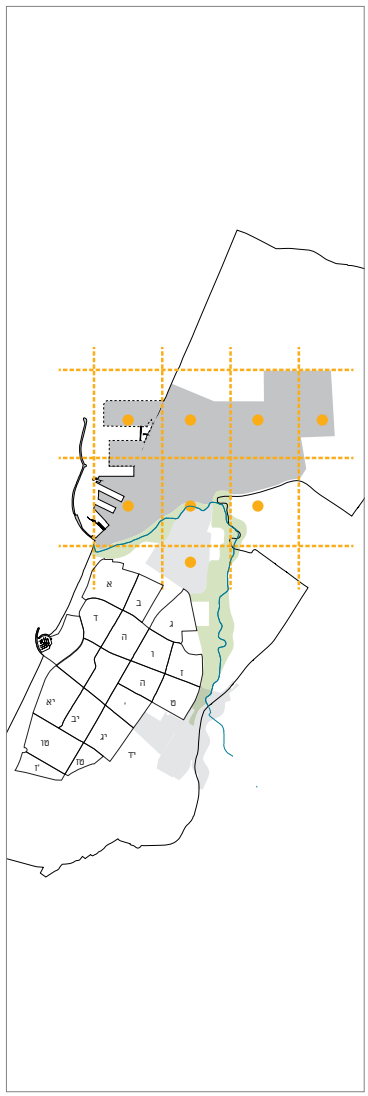
TRENDS



POLICY

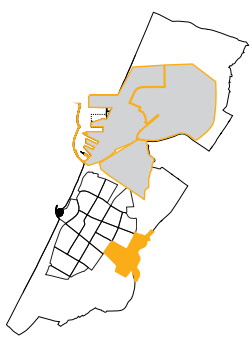


STRUCTURE

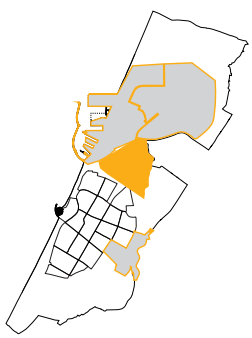


3 Vision and Detailed Strategy

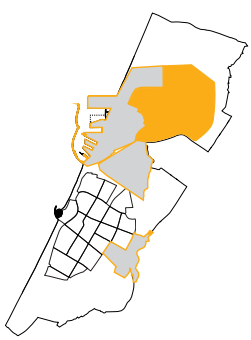
3. Vision and Detailed Strategy



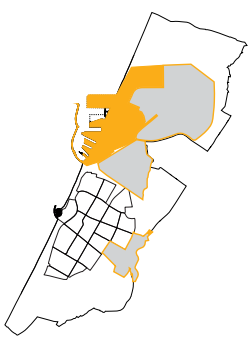
The Campus Quarter



The Mixed Quarter



The Manufacturing Quarter



The Port Quarter

3.1. Vision and Overall Strategy: Industrial Quarters

Ashdod, with its unique layout, diverse amenities (i.e, port, industrial areas, beach), and human capital, has an opportunity to become a leading Israeli city– economically, socially, and culturally. Developing the city's industrial areas in a progressive and comprehensive way, especially by better integrating them into the wider city, will enhance the city's growth, improve residents' welfare, and support the city's employers.

The vision put forward here includes four key goals:

1, 2, 3

1. Integrate the city with its industrial areas, by envisioning the city as one entity. This means developing the city's industrial areas in conjunction with the development of the wider city. In terms of **livability**, there is a visceral quality to urban manufacturing that is essential to place making and civic pride in cities with an industrial history. Connecting to places of production and tapping into the city's creative and constructive spirit cultivates livability. Ultimately, the Fourth Industrial Revolution serves as an opportunity to shape a future that supports all residents by prioritizing an urban quality of life and empowering people.

2. Retrofit the spatial and physical organization of industrial areas. Based on the structure of the quarters, this vision reorganizes the industrial areas of Ashdod into four quarters: the **Port** quarter, the **Manufacturing** quarter, the **Mixed** quarter, and the **Campus** quarter. Similar to Ashdod's residential areas, the industrial quarters are developed with attention to the following: 1) physical planning and boundaries; 2) a defined core, either an amenity or an open space; 3) circulation and orientation, including an internal, secondary circulation network; and 4) a particular architectural style and identity.

3. Draft a clear development policy for each area. Particular policies should be drafted for each quarter, but policies related to three key themes should be drafted for all of the quarters: (1) collaborative frameworks, (2) environmental issues, and (3) education and public amenities.

4

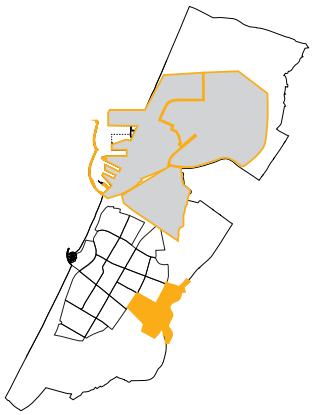
4. Develop an integrated managerial body that will support the industrial quarters. This body, which should include both planners and policy makers, will be responsible for leading a visioning process, physical planning, policy-making and implementing ideas and projects relating to industry. The goal of this body is to ensure that existing industrial sites are divided, named, and reorganized in a way that will facilitate a clear strategy that ensures optimal physical planning and economic development.

In the following pages, a vision and an overall strategy for each quarter is presented, detailing the tools in planning and policy required to achieve the goals presented as well as relevant case studies from around the world.

3.2. THE CAMPUS QUARTER

The Campus Quarter | Existing Conditions and Plans

There are many disparate plans for the area, and these plans lack an integrative framework, such as an internal circulation network or a landscape system. Current and proposed uses - medical and educational facilities, residences, high tech. industries, and commercial uses, including a shopping center - are highly compatible. The area is adjacent to the Nitzanim Sand Dune Park, a outstanding asset, and the Ashdod Ad Halom railway station. There is a great opportunity to develop single, unified area, especially by linking compatible uses through various systems.



Hospital under Construction from Menachem Begin Blvd.

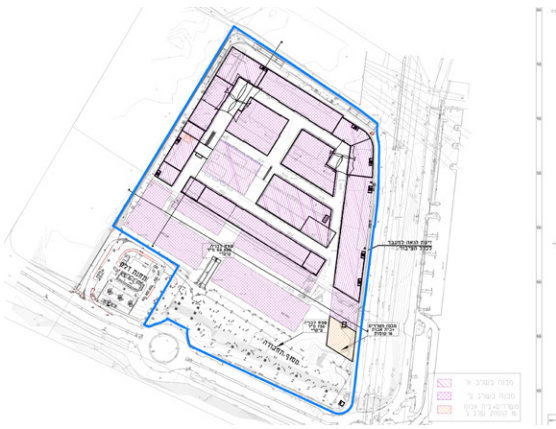
Nitzanim Sand Dune Park

Hospital under Construction from Sderot Altalena

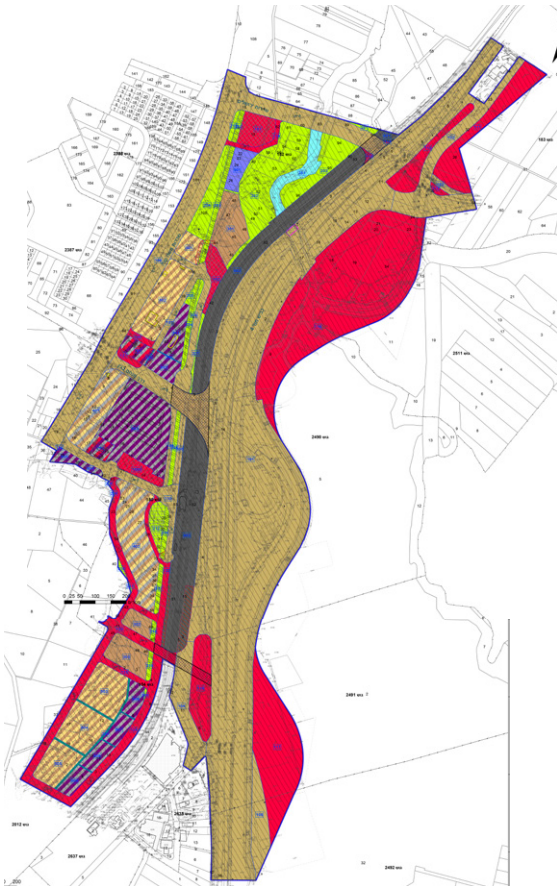
Nitzanim Sand Dune Park

Plan for an Academic Campus and Residences

Plan for the Assuta Ashdod University Hospital



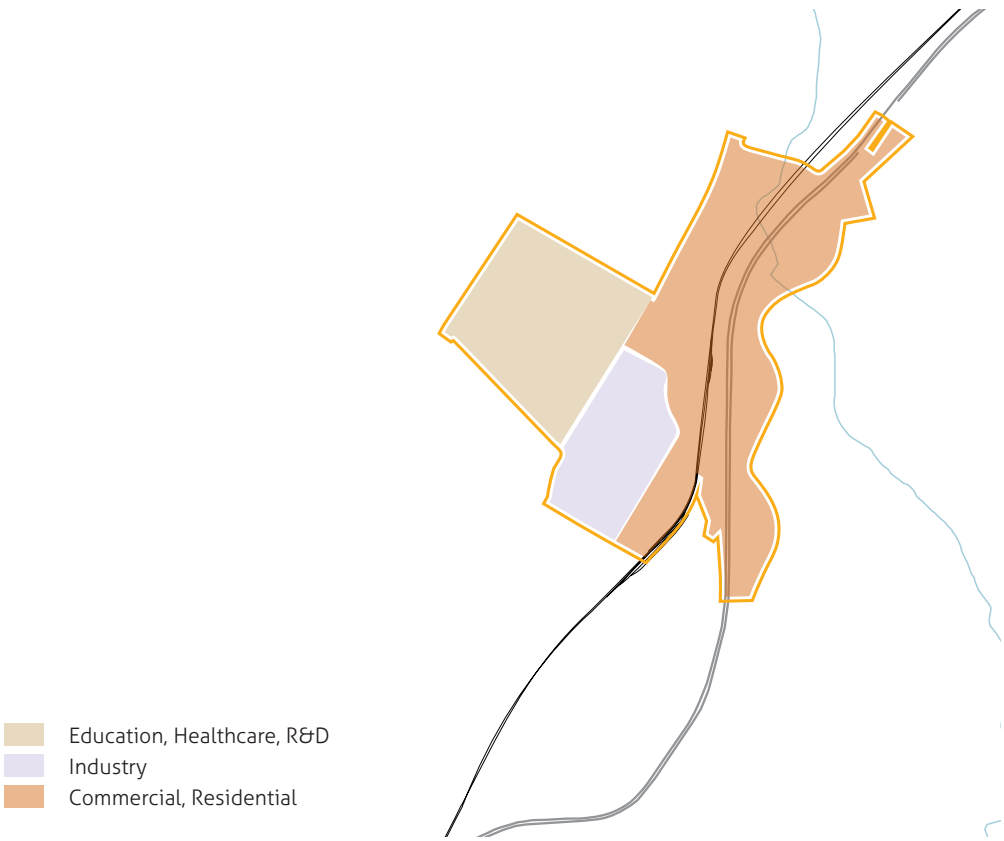
Plan for BIG Fashion Ashdod



Plan for Development near Ad Halom Interchange

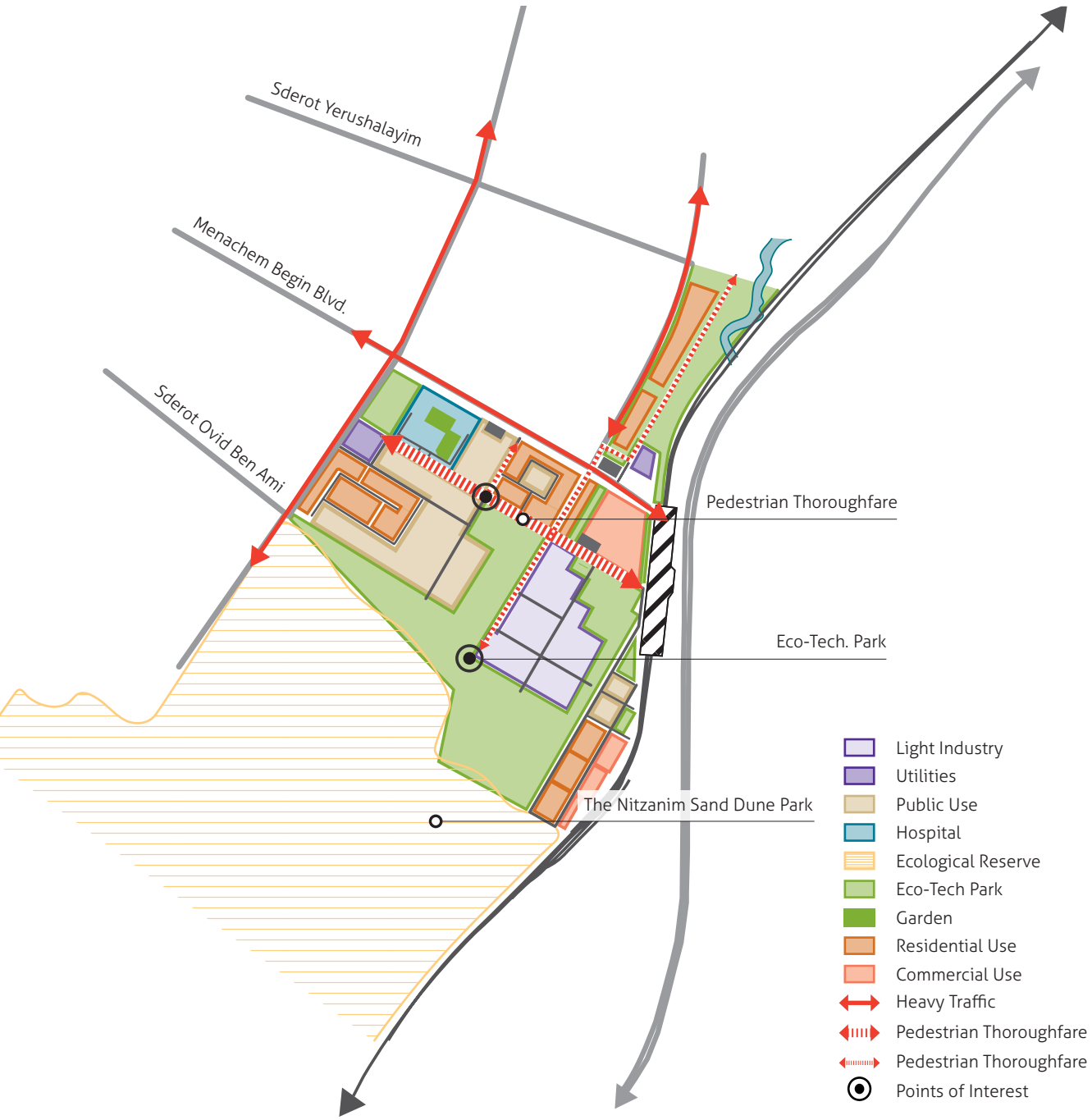
Plan for a High Tech. Industrial Center

The Campus Quarter | Vision



Develop a unique, integrated quarter characterized by its mix of uses (healthcare, manufacturing, education, and residential amenities) set in a sand-dune eco-tech park of regional importance. Through physical planning, provide a spatial structure that will support the growth of an urban ecosystem anchored by a hospital, an academic campus, and new types of production and manufacturing. Through policy, establish a collaborative body that will guide the development of the quarter and respond not only to tenants' needs but also to new inventions, research, and trends; and require buildings to meet the highest standards in green construction.

The Campus Quarter | Conceptual Scheme



The Campus Quarter | Physical Planning and Policy Goals

Physical Planning

Industrial Urbanism: Set design guidelines that support various uses and dynamic interactions between people and organizations; address environmental conflicts (e.g., bio-waste disposal in proximity to residential buildings) by promoting innovative, sustainable solutions

1

Transportation: Develop a multi-modal system (e.g., train, bus, shuttle bus, bicycle, sidewalks) with quick and easy inter-modal connections (e.g., train to shuttle bus, bicycle to train) to guarantee convenient transportation from point A to point B

2, 3

Landscape: Use the landscape as a tool to integrate areas within the site and make it a regional attraction by developing a system of points of interest; creatively pull this landscape into the quarter, protect it, and provide easy and quick access to walking trails

4

Education: Develop the academic campus as a central node that links varied uses through diffuse boundaries and other tools

1. Bus, factor[e] design initiative (the Noun Project), CC BY 3.0; 2. Tree, Pipe Rosas Licht (the Noun Project), CC BY 3.0; 3. Bench, Gerardo Martín Martínez (the Noun Project), CC BY 3.0; 4. Book, Viktor Vorobyev (the Noun Project), CC BY 3.0

Policy

1

Industrial Urbanism: Establish a body to manage the quarter and lead its continued development; this body should play a role in coordinating collaboration and bilateral or multilateral exchanges between tenants

2

Environmental: Set policies forbidding the storage of hazardous materials and regulating the disposal of bio-waste; set quantifiable environmental standards for the quarter; and cultivate a sustainable and resilient environment

Transportation: Provide funding for a multi-modal system with convenient inter-modal connections

Landscape: Protect sand dunes and trees, especially mature trees and trees in groups; achieve the highest standards in green construction, especially in energy efficient building design

Education: Develop programs that will support city residents at large

1. Share, Alex Podolsky (the Noun Project), CC BY 3.0; 2. Barrel, Mark Caron (the Noun Project), CC BY 3.0

The Campus Quarter | Physical Planning and Policy Tools

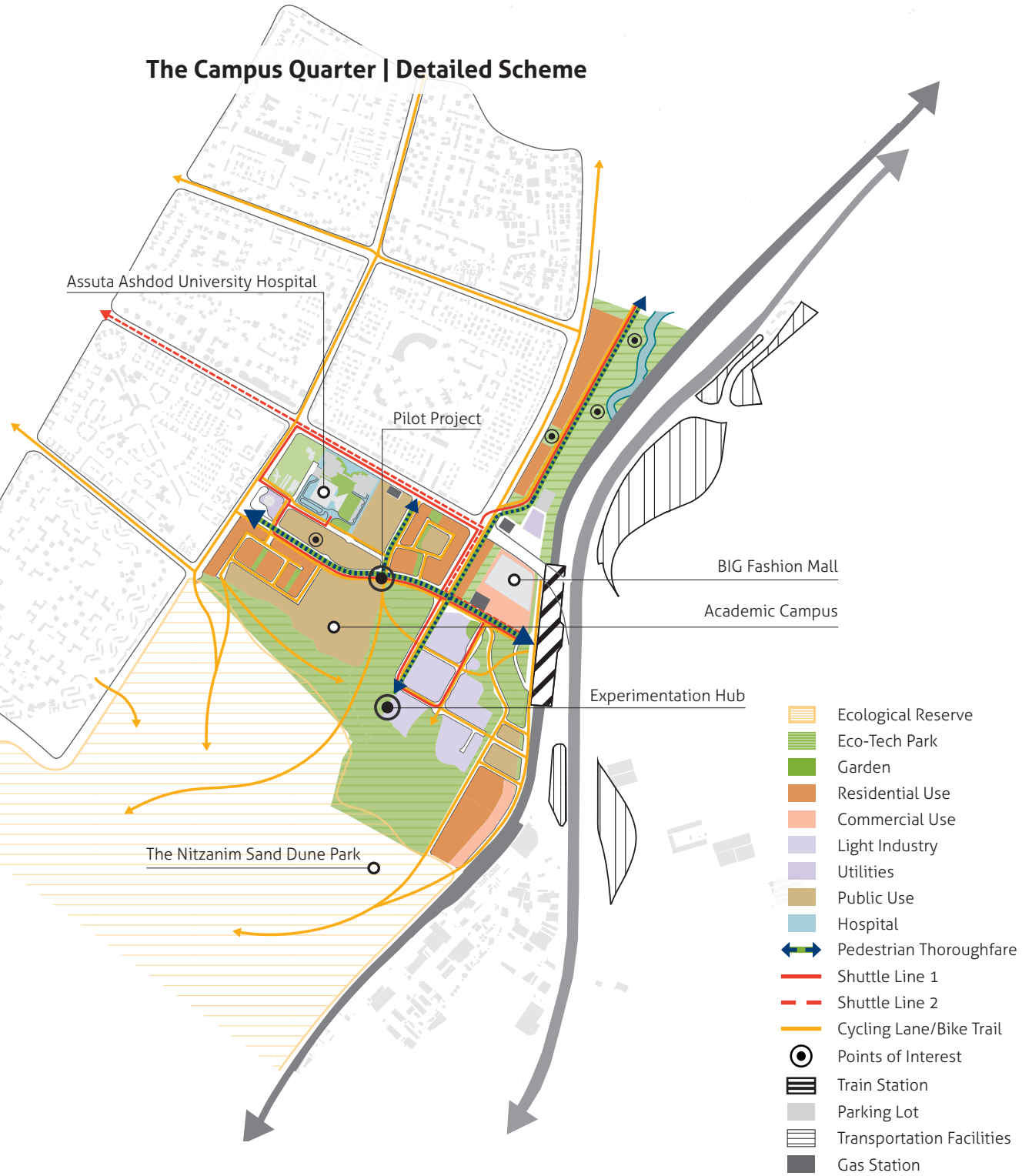
Physical Planning

- Develop a central corridor bisecting the site that will promote accessibility and support community engagement and exchange
- Develop an integrated multi-modal transportation system
- Set design guidelines by use that respond to 1) the idea of an urban ecosystem and 2) the idea of an eco-tech park (e.g., building orientation, "green" roofs including rooftop gardening or agriculture)
- Guide massing (by setting maximum and minimum building heights and offering incentives to "build-to" a desired height)
- Encourage owners of lower buildings to use their roofs (e.g., green roofs, rooftop café/bar)
- Establish an eco-tech park by extending the sand-dune reserve into the quarter and cultivating a diffuse boundary between the reserve and the site's healthcare, manufacturing, educational, and residential facilities

Policy

- Establish a collaborative hub for experimentation and prototyping that is open to the public and that offers general amenities (e.g., cafes, kiosks)
- Commission a pilot project at the intersection of the environment, healthcare, and technology domains to cultivate the quarter's identity and to promote the quarter
- Set aside an area for flexible future development (a wide-range of allowed uses) so that the quarter can respond to new needs and trends
- Allow clean, advanced manufacturing in residential areas where commercial uses are allowed and in commercial and academic areas (e.g., small-scale manufacturers using 3-D printing)
- Require buildings to meet green building standards set by the Ministry of Environment Protection and the Standards Institution of Israel
- Recruit manufacturers that can build on and/or contribute to existing strengths (e.g., healthcare services)

The Campus Quarter | Detailed Scheme

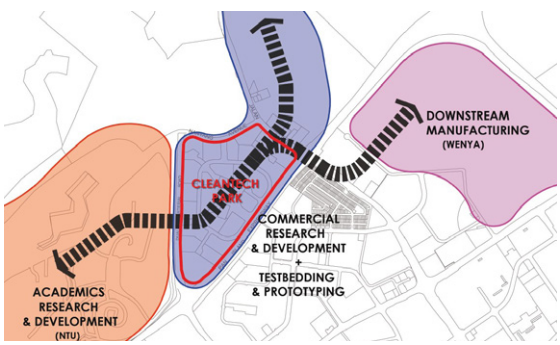


The Campus Quarter | Learning from Other Cities

From Segregation to Integration: Jurong, SG

Challenges

- The government constructed residences and recreational amenities in Jurong Industrial Estate to provide for and attract workers, and connected Jurong to wider Singapore via the Mass Rapid Transit (MRT) system
- Historically, industrial uses in Jurong were separated from residential and related uses, but due to land scarcity, the government put forward a plan to integrate the disparate areas, Jurong East and West, and accommodate an additional 1 million residents



Clean Tech Park Relationships | *JTC Corporation (2010)*

Strategies

- The Jurong Town Corporation, charged with enacting the government's plan, has relocated economically important manufacturers emitting high levels of pollution to Jurong Island, off the coast, to ameliorate land use conflicts
- Jurong Island was built through land reclamation in response to demand for industrial land, a scarcity of land on Singapore, and the need to put a physical barrier between polluting manufacturers and urban, mixed-use areas
- Clean Tech Park, a project to promote the development of alternative energy and sustainable solutions to urban problems, is being built close to the Wenya Industrial Estate and Nanyang Technological University (NTU); the intent is for Clean Tech Park firms to collaborate with NTU on R&D and Wenya Industrial Estate manufacturers on production
- The Clean Tech Park will be held to high sustainability and environmental standards through the use of quantifiable performance indicators across three areas: environmental, social, and economic
- Singapore has extended its Planned Unit of Development (PUD) model from its residential communities to the industrial estate of Jurong; this model demands a higher density of amenities and transit stops
- The "White Site" concept: Singapore expanded its zoning categories for industry to include a new category for non-polluting manufacturers that engage in R&D or industrial activities that are high-value added and/or knowledge intensive; within the area set aside for these manufacturers, Singapore increased the quota for "White Space," an area that must be set aside for public life, but otherwise may be used flexibly by developers - thus, developers are free to build a community center, a hotel, or even residences in response to needs and trends.

Adapted from Yin, Zixiao, "From Segregation to Integration: Jurong, SG" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)

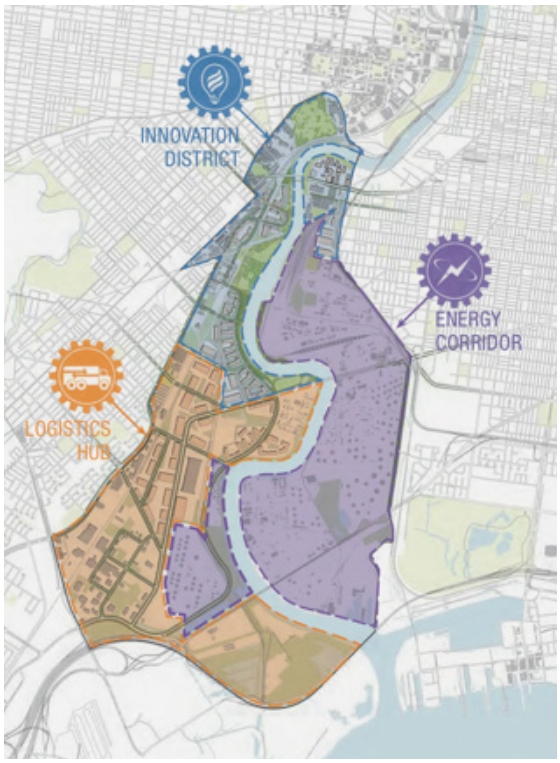
Industrial Planning and Innovation: Philadelphia, USA

Challenges

- Philadelphia has struggled to adapt to economic shifts that have led to the contraction of industrial activity in the city and that have made it crucial to attract research- and design-intensive industries
- Although property values and income have risen in some close-in neighborhoods, the city's poverty rate remains high

Strategies

- Philadelphia completed an analysis of its leading economic clusters in 2010 for its Industrial Land & Market Strategy report; geographical analyses are an important component of this analysis, and the categorization of areas as "industrial intensification," "industrial protection," or "transition" areas effectively identifies areas that are vital and areas that could be better utilized in other ways
- The city initiated a full-scale revision of its zoning code in 2012 and has established two new zoning categories: the first permits some light industrial uses (e.g., R&D) in addition to residential uses, while the other permits light industrial uses and commercial uses, but not residential uses
- The Lower Schuylkill Master Plan envisions three campuses within an industrial area in southwest Philadelphia: an innovation campus near the University of Philadelphia, an energy campus building on an existing refinery, and a logistics campus building on access to the interstate highway system and the Philadelphia International Airport



Vision for Three Campuses | *Philadelphia Industrial Dev. Corp.*

Adapted from Liss, Louis, "Industrial Planning and Innovation: Philadelphia, USA" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)

The Campus Quarter | Additional Studies

Physical Planning

- An analysis of the site's natural resources, including its ecology, and opportunities and threats
- A study of the interface between the eco-tech park and the sand dunes
- A study of the existing residential building typologies and proposed construction (residential and office building typologies) on the site, to ensure that these typologies will fit with the vision of the quarter

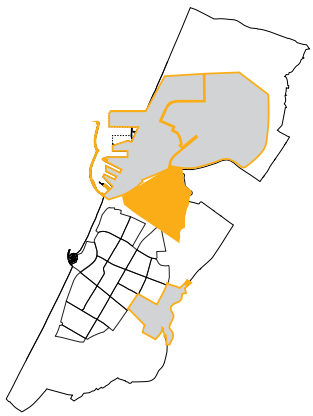
Policy

- An examination of potential frameworks and topics for cooperation and collaboration between the site's tenants
- An analysis of waste and recycling streams and practices, especially with regard to bio waste produced by the hospital and hazardous waste

3.3. THE MIXED QUARTER

The Mixed Quarter | Existing Conditions and Plans

There are plans for two residential projects, one in the east and one in the west. The latter includes recreational and entertainment uses. The planned areas are meant to function autonomously. The areas are not integrated into the existing mixed-use area. The focus of these plans on residential and related uses is problematic. Non-industrial uses have been encroaching on industrial uses in the area, and they are threatening the long term sustainability of manufacturing in the area. Industrial regeneration is imperative. On a typical workday, this area buzzes with activity. To preserve the vibrancy of this area and its economy, demolition must be rejected as a viable alternative.



Typical Street | *Max Moinian*

Typical Street | *Max Moinian*

Commercial Uses in Quarter | *Max Moinian*

Commercial Uses in Quarter | *Max Moinian*

Plan for a New Residential Area

Plan for a New Residential and Recreational Area

Detailed Plan for a New Residential and Recreational Area

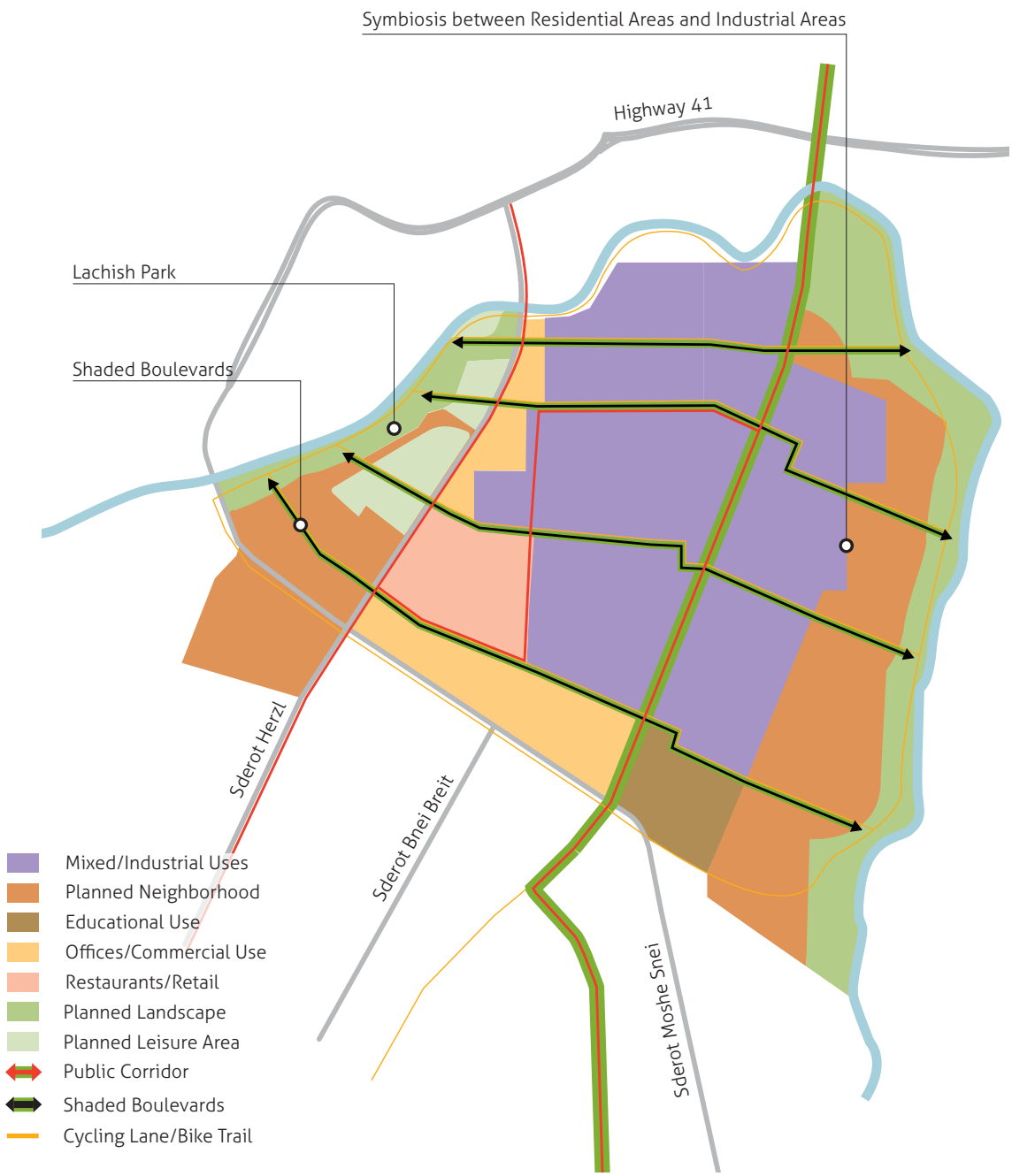
The Mixed Quarter | Vision

Mixed/Industrial Use
Planned Neighborhood
Lachish Park

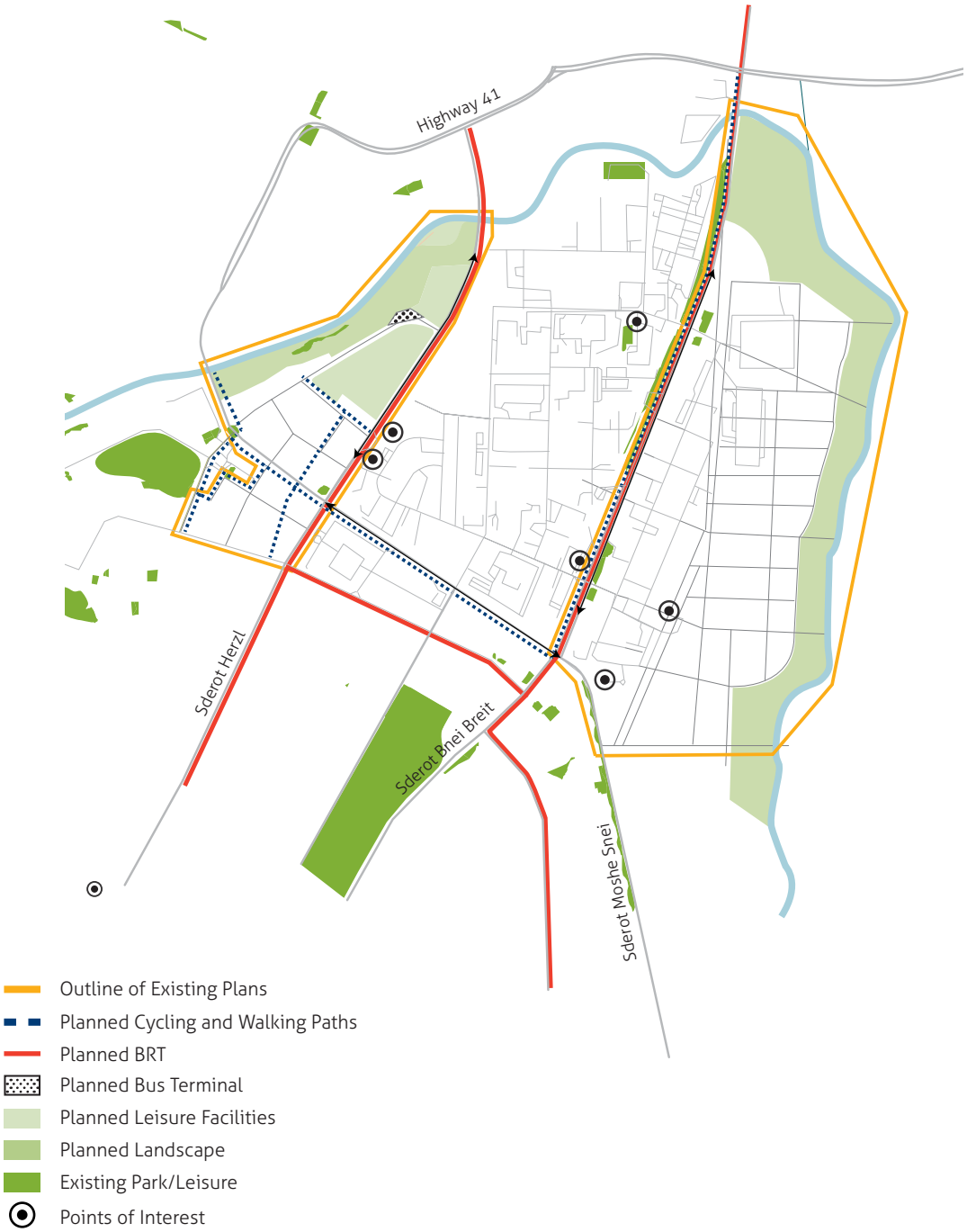
Develop a dynamic and thriving live-work quarter distinguished by the coexistence and mixing of light industrial and residential uses, the unique opportunities this proximity generates, and quick, targeted, and innovative solutions to environmental conflicts. Through physical planning, develop infrastructure and set design guidelines that unify the quarter, making it legible as an integrated entity, and simultaneously cultivate the unique character of each of the quarter's subsections. Through policy, provide a supportive framework for the quarter's manufacturers by establishing industrial community centers, and protect industrial uses within the quarter, especially workshops that manufacture products for local sale (e.g., ceramics, wood products, bread and baked goods).

Adapted from Benyamin, Ran and Pragier, Einat, in *An Analysis of the Industrial Areas in Ashdod: Physical, Social, and Administrative Dimensions*, 2017 (http://www.industrialurbanism.com/report-ashdod-1)

The Mixed Quarter | Conceptual Scheme



The Mixed Quarter | Existing Conditions: Existing and Planned Green Space and Circulation



The Mixed Quarter | Existing Conditions: Clusters

- Available Land
- Unknown Program
- Public Buildings
- Planned Residential Use
- Tourism
- Trade, Services, Event Halls, Offices
- Planned Industrial Use
- Food Processing
- Cranes
- Construction
- Metalworking/Scape Metal Industries
- Chemicals, Pharmaceuticals, Cosmetics
- Fuel
- Sewage and Electricity Facilities
- Garages
- Logistics
- Storage and Packaging
- Printing and Paper Products
- Parking
- Planned Leisure Facilities
- Planned Landscape
- Existing Park/Leisure

The Mixed Quarter | Physical Planning and Policy Goals

Physical Planning

Industrial Urbanism: Set design guidelines that encourage a symbiotic relationship between residential and light industrial uses; resolve environmental conflicts, including noise pollution, by promoting targeted, creative solutions with an emphasis on coexistence and sustainability

Transportation: Develop five significant boulevards to unify the quarter's subsections and to connect the quarter to the wider city – four from east to west and one from north to south; extend the BRT into the quarter and connect the quarter's subsections to the BRT

Landscape: Make the north-south boulevard a green corridor, and confer special significance on this corridor though extensive high-quality landscaping. Pull the boulevards' landscaping into the quarter's subsections by extending it in creative ways that contribute to high-quality, interesting public spaces, especially around the industrial community centers

Education: Develop the academic campus as a central node that links varied uses through diffuse boundaries and other tools

Policy

Industrial Urbanism: Develop industrial community centers that support manufacturers by offering (1) one-stop-shop services (e.g., permitting), (2) communal resources (e.g., large and small spaces for rent, workshops/ conferences/exhibitions), and (3) branding and advertising services. Bring the agencies that influence and support industrial development and activity in Ashdod together under this roof (e.g., the Industrial Zone Administration, representatives from the Department of Industrial Development, the Municipal Employment Center, and the Employment Service Office, as well as The Mapach and Women in Business).

Environmental: Advance environmental policies that provide for the relocation of factories using, producing, and/or storing hazardous materials. The encroachment of public and commercial uses occurred before the city examined risk factors in these areas. This vision recommends re-examining the total number of existing and future threats in this area before additional uses are incorporated into the area.

Transportation: Provide the funding to extend the BRT network into the quarter and reassess the bus lane network; allocate land for public parking, especially for multistory parking structures; restrict on-street parking.

Landscape: Address environmental conflicts, including noise pollution, through case-by-case sustainable interventions

Education: Offer a range of programs and initiatives, similar to The Hive and The Kitchen, at the industrial community centers; partner with Economic and Labor Ministries as well as local manufacturers to develop these programs and initiatives; negotiate partnerships or bilateral agreements between local manufacturers and schools to establish apprenticeships and short on-the-job training courses

The Mixed Quarter | Physical Planning and Policy Tools

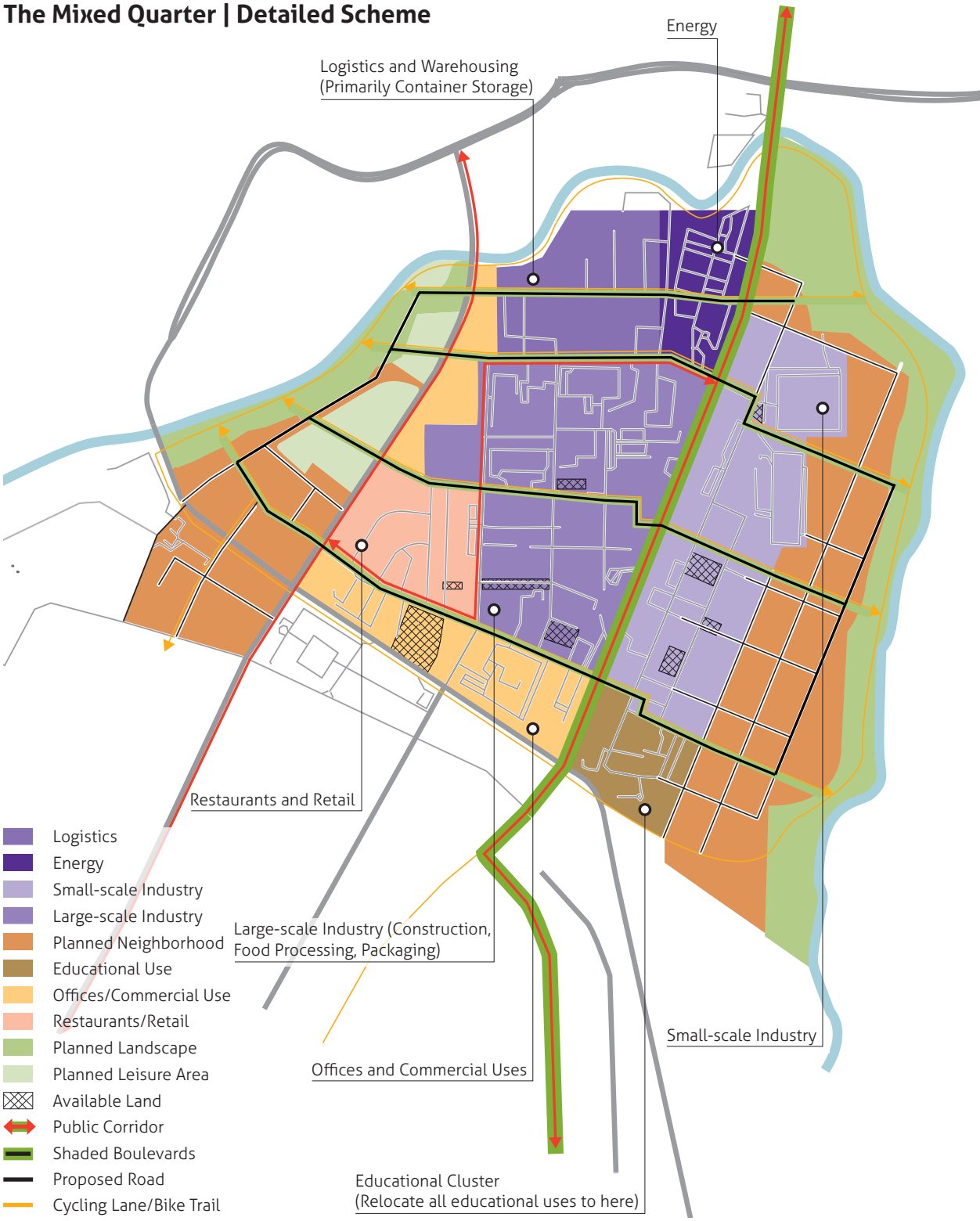
Physical Planning

- Reassess the bus lane network to 1) ensure that it has the widest service net possible, and 2) seamlessly integrate it into the quarter's multi-modal network, with a focus on inter-modal connections (e.g., bicycle to bus)
- Develop design guidelines that cultivate the unique character of each subsection with a particular emphasis on building typology
- Develop housing units and residential buildings that complement a live-work lifestyle
- Plant trees with large canopies along the quarter's boulevards to distinguish these streets and to provide shade
- Choose a design language that will be carried through the quarter (e.g., signs, street benches, lampposts, bicycling racks, and plants and flowers)
- Prohibit parking along the boulevards
- Allocate land for public parking

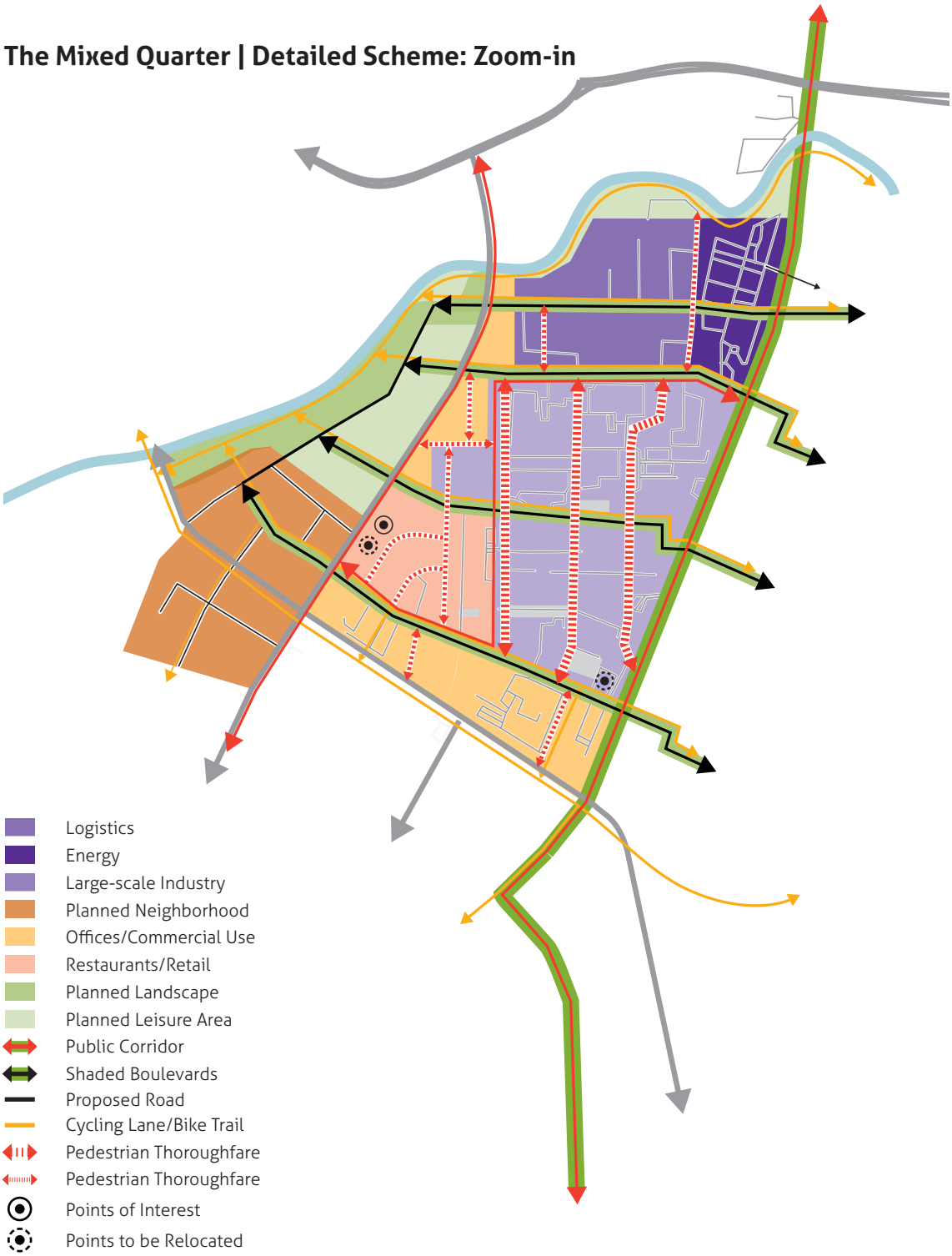
Policy

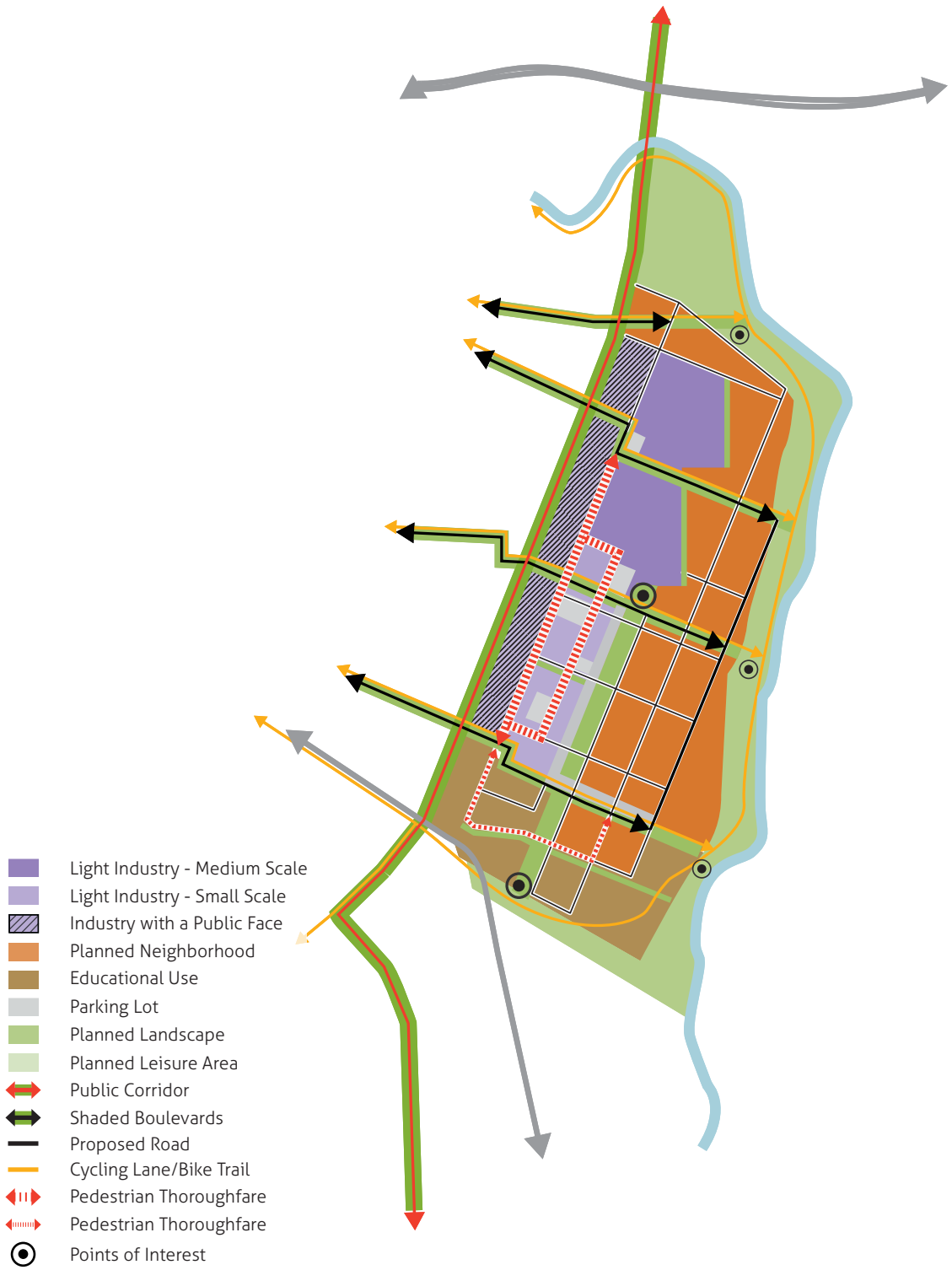
- Protect light industrial uses in the quarter from encroachment through incentives and regulations
- Identify and cultivate industrial clusters within the quarter
- Survey and inventory the vacant or abandoned buildings and plots in the quarter and develop a strategy to repurpose or redevelop them
- Make and publish a map that depicts the area as a quarter with subsections and shows the locations of workshops, stores, and amenities
- Expand educational programs in the area, especially through partnerships, and make the industrial community centers the loci for these programs

The Mixed Quarter | Detailed Scheme



The Mixed Quarter | Detailed Scheme: Zoom-in




Light Industry - Medium Scale
Light Industry - Small Scale
Industry with a Public Face
Planned Neighborhood
Educational Use
Parking Lot
Planned Landscape
Planned Leisure Area
Public Corridor
Shaded Boulevards
Proposed Road
Cycling Lane/Bike Trail
Pedestrian Thoroughfare
Pedestrian Thoroughfare
Points of Interest

The Mixed Quarter | Learning from Other Cities

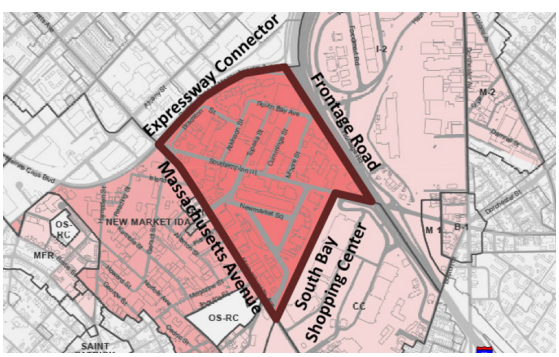
Aligning Social and Physical Strategy: Boston, USA

Challenges

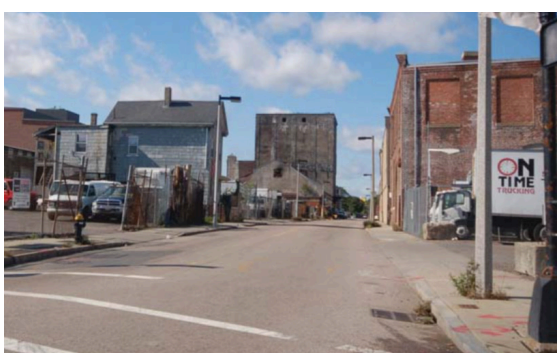
- New Market Industrial District hosts manufacturers engaging in food processing, distribution, and other light industrial activities
- There is competition between manufactures and real estate developers for a limited amount of available land
- The city recognizes the need to preserve and increase stable, well-paying job opportunities for low- to mid-skill workers
- Biotechnology manufacturers and other advanced manufacturers reject austere industrial areas in favor of more urban areas
- Illegal parking and dumping of waste made it difficult for pedestrians to walk within the district

Strategies

- Base zoning for industrial areas: Boston uses a continuum to structure what uses are allowed where; the parameters of this continuum are 1) the degree of dependency on access to or proximity to the sea, and 2) the degree of pollution allowed
- "Concepts for a Walk to Work Community:" this report initiated an effort to balance the needs of freight transportation and pedestrians in physical planning, and put forward a vision that imagined the district as a walk-to-work industrial community; later
- A transit-oriented planning initiative proposed improvements for the area around the commuter rail station within the district
- Boston designated the district as an eco-industrial zone to provide a framework for articulating sustainability and environmental goals for the area
- Overlay zoning: the city set design guidelines to cultivate a unique, local identity and offered special loans to companies in the district to encourage improvements



Rezoned Areas around the New Market District | *BPDA*



New Market District | *The American City Coalition and Utile, Inc*

Adapted from Taft Mueller, Zoe, "Aligning Social and Physical Strategy, Boston, USA" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)

Establishing a Unified Front against Encroachment: Seattle, USA

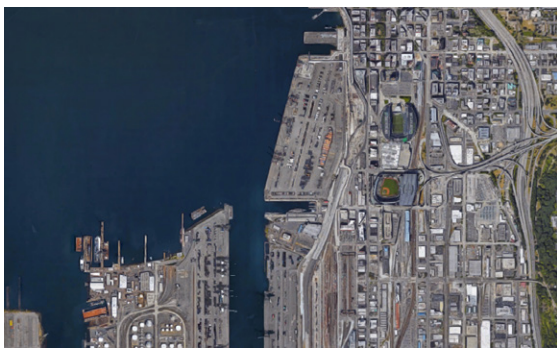
Challenges

- The Duwamish Manufacturing and Industrial Center (DMIC) is south of Seattle's downtown area and is separated from this area by a sports entertainment district that includes two new stadiums; both downtown Seattle and the sports district have generated real estate demand for the center's land, and the latter has caused traffic congestion that interferes with industrial operations
- Industrial land in Seattle is limited, and industrial land with deep harbor access and proximity to logistics networks is scarce

Strategies

- Seattle ensured that its land use regulations were nested or vertically integrated with regional- and state-level economic development policies and plans
- Central considerations in Seattle's base zoning are the geographical uniqueness and economic significance of the land in question
- The state of Washington's Growth Management Act requires municipal planning departments and port operators to engage in joint strategic planning to preserve land for port and port-related activities, to provide access to the port via freight corridors, and to address land use conflicts at the port-urban boundary
- The Puget Sound Regional Council conducted an economic analysis of the competitiveness of all industrial lands to encourage specialization and to situate these lands relative to local, regional, and national trends

Duwamish Center | *Puget Sound Regional Council report (2015)*



CenturyLink Field, Safeco Field, Duwamish Center | *Google Maps*

Adapted from Taft Mueller, Zoe, "Establishing a Unified Front Against Encroachment: Seattle, USA" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)

The Mixed Quarter | Learning from Other Cities

Environmental Remediation on the Waterfront: Gowanus Canal, USA

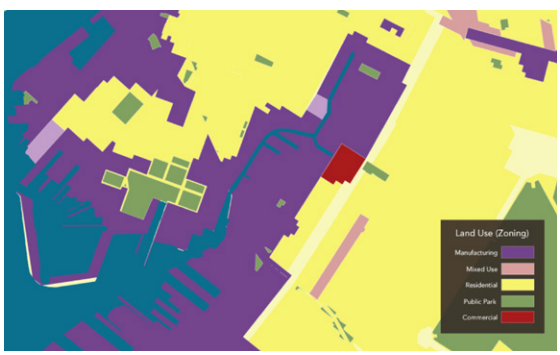
Challenges

- The Gowanus Canal flows between two Brooklyn neighborhoods, Carroll Gardens and Park Slope, and is lined with active industrial sites, disused industrial sites, and parking lots
- The adjacent neighborhoods are changing; property values have risen substantially and commercial uses, especially stores selling building materials, have taken over parcels next to the canal
- Pollutants have accumulated in the canal over the course of more than a century and have caused grave environmental damage
- The canal is undergoing environmental remediation with the goal of greatly improving the canal's water quality; restoring habitats for marine life, birds, and other creatures; and, eventually, allowing public swimming
- The high cost of remediation, the complexity of rezoning the area, and the number of stakeholders vested in the canal have complicated efforts

Strategies

- The federal government has designated the Gowanus Canal a "Superfund" site, a designation that initiates a step-by-step process to examine a contaminated area, propose a plan, and carry out remediation; federal funds are allocated for the clean-up of "Superfund" sites
- The Sponge Park pilot project, a 195 sqm area, will be a green-infrastructure prototype, using special plants, sand beds, and soil to retain and filter storm-water runoff before it is discharged into the canal
- A community group has organized public recreational events on the canal – kayaking, etc. – to raise the profile of the canal within the local area, to encourage stewardship, and to cultivate a public commitment to ongoing efforts to remediate the canal.

The Dredgers Club on the Canal | *Jonathan Barkey*



Zoning near the Canal | *gowanuscanal.org*

Adapted from Moinian, Max, "Environmental Remediation on the Waterfront: Gowanus Canal, USA" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)

The Mixed Quarter | Additional Studies

Physical

- An analysis of existing landscape resources and the preparation of an appropriate strategic plan
- An analysis of all existing traffic patterns and systems and the formulation of a synchronized transportation plan with an emphasis on inter-modality and sustainability

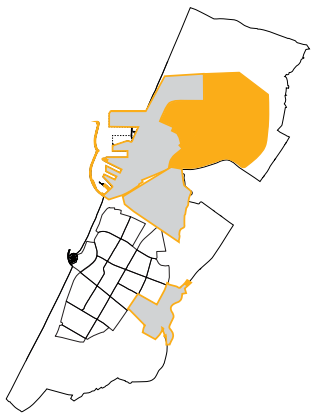
Policy

- A survey of vacant building/vacant properties
- An analysis of market demand and needs

3.4. THE MANAFACTURING QUARTER

The Manufacturing Quarter | Existing Conditions and Plans

Existing plans (approved and under review) prioritize the efficiency of the transportation network above all else. As a result, the area is fractured into smaller, isolated areas. The lack of a grid and clearly defined blocks makes the area difficult to navigate. Presently, the area is mostly undeveloped, but it is expected to host industrial uses, especially large-scale manufacturers. There is an opportunity to systematically layout the area such that it is functional, efficient, and accessible. Accessible means accessible to the public; this is where Ashdod's manufacturing sector and its manufacturers could be showcased.

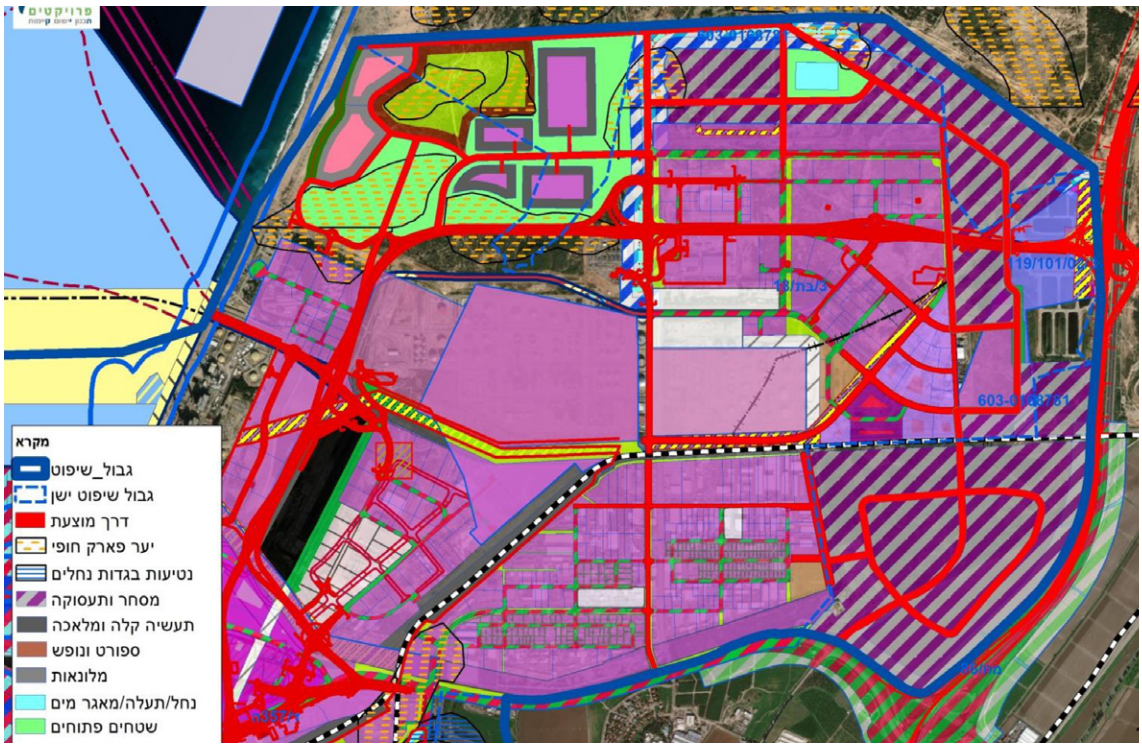


Typical Industrial Use

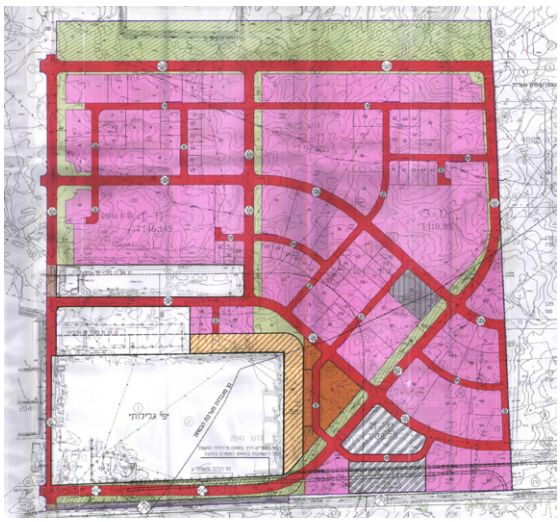
Typical Street

Typical Street

Typical Street

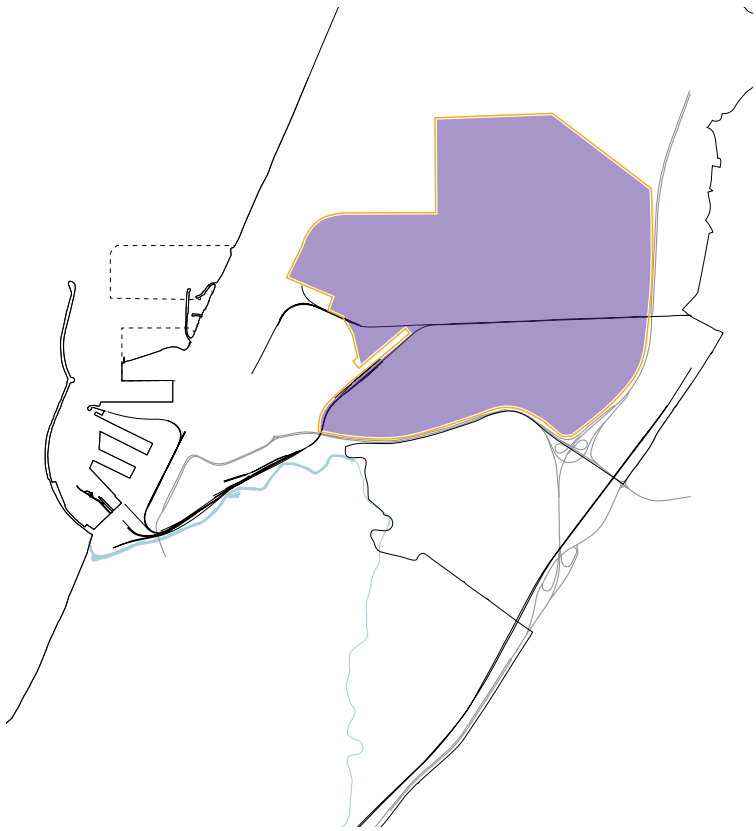


Proposed Plan (Under Review)



Approved Plan

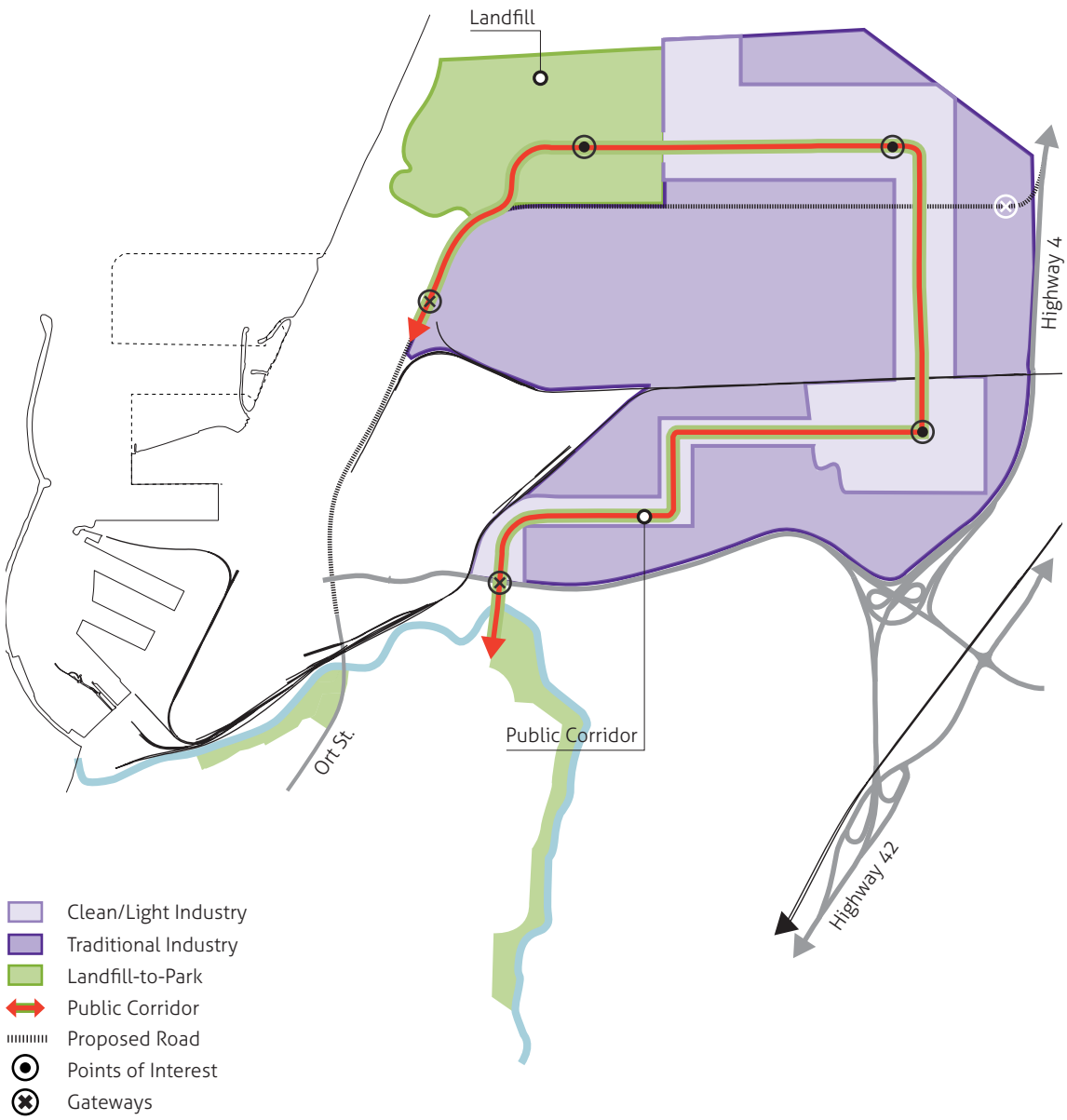
The Manufacturing Quarter | Vision



Large-scale Traditional Industry

Develop an accessible, systematized quarter that supports manufacturing activity and highlights Ashdod's manufacturing sector through a high-visibility public corridor with educational amenities featuring manufacturing processes. Through physical planning, provide an easy-to-navigate network of streets, a public corridor, points of interest, gateways to the quarter, and a center that supports manufacturing activity. Through policy, develop a center to support manufacturing activity and educational amenities along a public corridor to teach the public about manufacturing processes.

The Manufacturing Quarter | Conceptual Scheme



The Manufacturing Quarter | Physical Planning and Policy Goals

Physical Planning

Industrial Ecosystem: Develop physical infrastructure and set design guidelines that create a high-quality business environment and support the exchange of materials, services, and knowledge.

Environmental: Define a dedicated area for the storage of hazardous materials. The main planning and environmental issues stem from bonded warehouses and the storage areas in the port, alongside the heavy industrial zone.

Environmental: Rehabilitate abandoned landfills. The need to contend with contamination and pollution requires action that is consistent with the nature of the area and observed needs. The rehabilitation process may reference precedents, and channel environmental damage into industrial benefits, such as the reuse of emitted gases for energy generation or other industrial processes. (methane gas, commonly found in landfills). In the future, abandoned landfills can serve as open green areas, depending on its location and the extent of environmental damage.

Transportation: Provide good access to the quarter from Highways 4, 14, and 7 and the wider city; offer tenants and the public an easy-to-navigate street network through a grid pattern with numbered streets; build flexibility into this grid-pattern network by allowing the merger of parcels to accommodate larger factories; extend Ashdod's BRT system into the quarter by running a line along the quarter's high-visibility public corridor.

Landscape: Emphasize the quarter's public corridor with high-quality landscaping; link the Lachish Park and the park to be built on Ashdod's reclaimed landfill via the quarter's public corridor.

Education: Build a high-visibility public corridor that showcases manufacturing processes and Ashdod's manufacturers; develop educational amenities related to industry and STEM fields (science, technology, engineering, mathematics) more broadly along this corridor.

Policy

Industrial Ecosystem: Develop a center to support manufacturing activity, especially knowledge transfer, bilateral agreements to trade materials and services within the quarter, and business recruitment

Transportation: Provide funding to extend the BRT system into the quarter; allocate land for public parking; restrict on-street parking

Landscape: Use the landscaping along the public corridor to attract new manufacturers by offering them representational "front doors"

Education: Develop educational amenities along a high-visibility public corridor to teach the public about manufacturing processes and Ashdod's manufacturing sector

The Manufacturing Quarter | Physical Planning and Policy Tools

Physical Planning

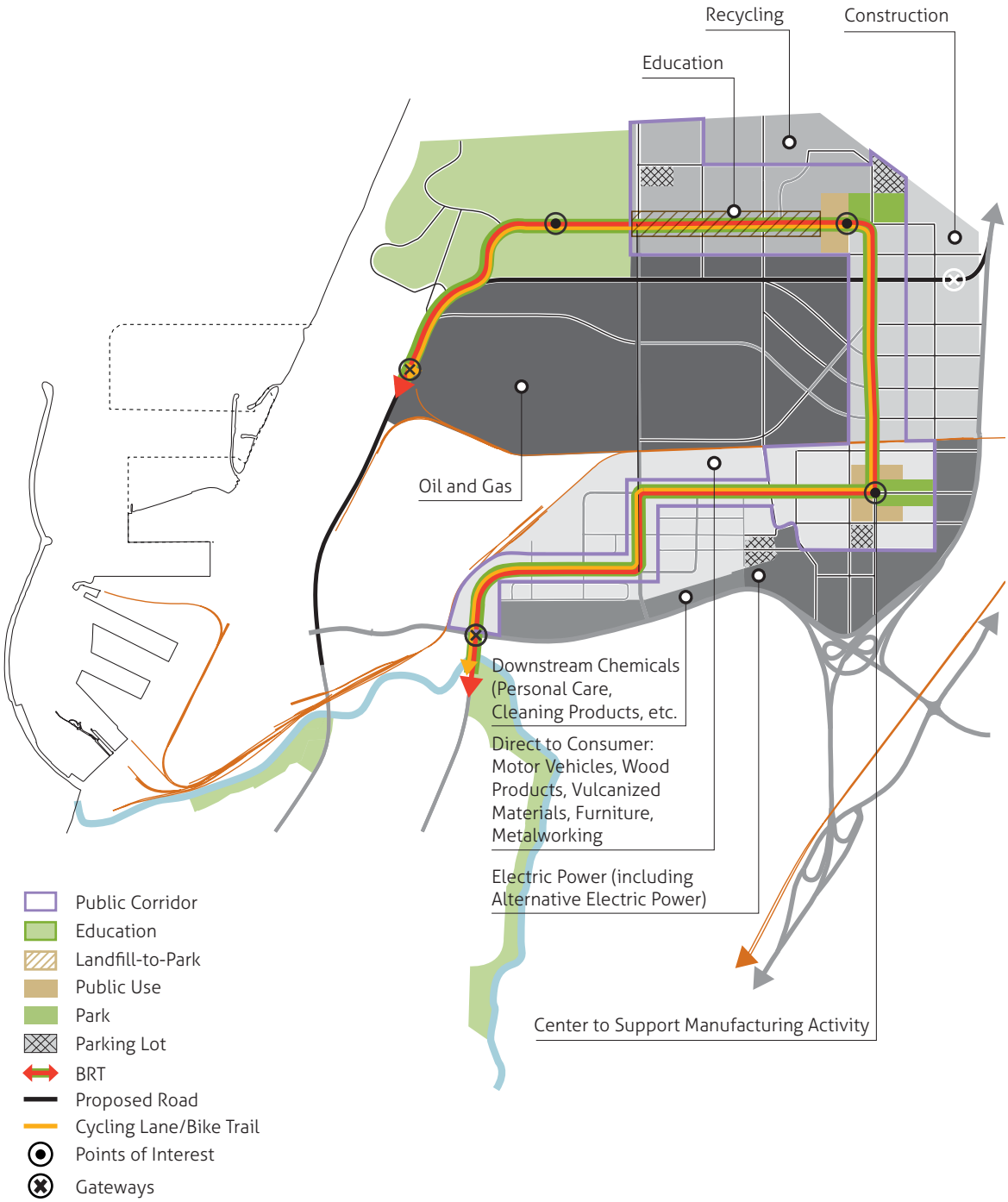
- Organize the quarter's street network in a grid pattern (to the greatest extent possible)
- Use numbers and letters as street names (e.g., 1St St., 2nd St., etc., for north-south streets and A St., B St., etc., for east-west streets)
- Set aside two types of "white space," one where a wide range of uses are permitted to allow rapid construction to take advantage of emerging needs or trends and one where in exchange for community benefits, manufacturers may build more unrestrictedly (e.g., more densely).
- Make the public corridor a green corridor to reinforce its uniqueness and prominence and to cultivate its own identity
- Set design guidelines that require manufacturers along the public corridor to 1) orient their facilities toward the street, 2) have façades of at least 30% transparent glass, 3) place their service entrance and related operations at the rear of their facilities, and 4) provide parking for employees on their facilities' grounds
- Make the public corridor a "complete street" by maintaining cycling lanes, sidewalks, landscaping, and benches along the length of the corridor
- Prohibit parking along the public corridor
- Allocate land for public parking
- Landscape 1) the gateways to the quarter and the corridor, 2) the corridor itself, and 3) the transition from the corridor to the reclaimed landfill (park)

Policy

Develop a center to support manufacturing activity, especially by doing the following:

- Identify clusters by inventorying and categorizing the manufacturers within the quarter (e.g., construction services, custom workshops/manufacturers)
- Recruit common suppliers and/or common retailers
- Provide support for business expansion (e.g., aid expanding manufacturers in site selection)
- Hold events to support knowledge transfer
- Promote recycling and reuse, especially of manufacturers' by-products and scrap materials

The Manufacturing Quarter | Detailed Scheme



The Manufacturing Quarter | Learning from Other Cities

Industrial Symbiosis: Kalundborg, DK

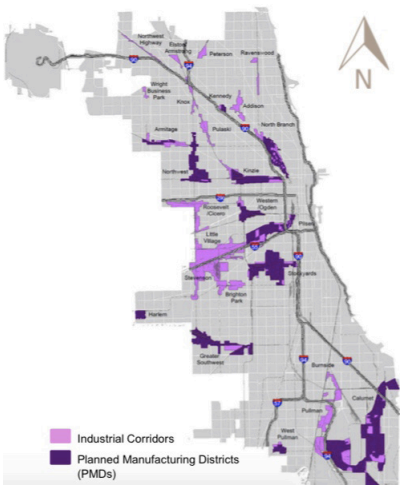
Challenges

- Several industrial zones radiate outward from Lake Michigan parallel to railroads and highways
- In the mid-20th century, industrial operations in Chicago contracted and some industrial areas were abandoned
- For several decades, Chicago focused on high-visibility, waterfront and downtown developments; while this strategy led contributed to a beautiful and distinctive cityscape, it weakened the city economic robustness and neglected many residents
- Thousands of jobs were lost due to the conversion of industrial buildings into residences

Strategies

- Chicago established Planned Manufacturing Districts (PMDs) to protect industrial land from conversion and encroachment; PMDs may include a transition area where mixed-use development is allowed; the flexibility of PMDs as a zoning tool makes PMDs more responsive to emerging trends in manufacturing and in the economy
- The city constructed the Riverwalk, a roughly 2 km trail through Chicago's downtown, to provide access to a segment of Chicago's coastline that was historically industrial and inaccessible; Chicago is also adapting a historic elevated railway, the Bloomingdale Line, into a trail; there are opportunities to connect both of these trails to Chicago's PMDs

Adapted from Budovitch, Max, "Strategic Zoning and Creative Repurposing: Chicago, USA" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)



Chicago's Industrial Corridors and Planned Manufacturing Districts | *Mayor Emanuel's Industrial Corridor Modernization: North Branch. Community Meeting, Feb 21, 2017.*

Goose Island PMD | *marketurbanism.com*

Strategic Zoning and Creative Repurposing: Chicago, USA

Challenges

- Water is scarce in Kalundborg, and a pipeline from Lake Tassø to the Statoil refinery is a critical piece of infrastructure
- Surging oil prices during an oil crisis in the 1970s compelled firms to look for ways to use energy more efficiently

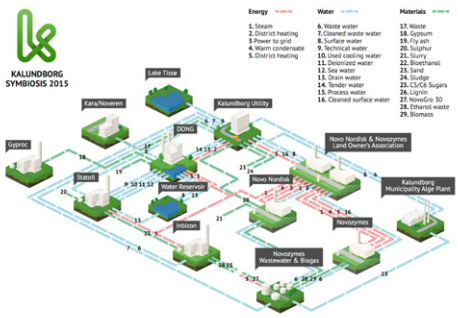


Diagram of Industrial Symbiosis | *Symbiosis Institute*

Strategies

- Industrial symbiosis emerged in the industrial community at Kalundborg as the result of bilateral agreements between manufacturers; for example, the power station, Asnæs, receives natural gas from Statoil, and sells steam to Novo Nordisk, an insulin producer
- The use of bilateral agreements makes the system nimble – it's able to quickly adapt to evolving market trends and new technology
- The regulatory system in Demark supports the sort of symbiosis found at Kalundborg; Danish environmental legislation prioritizes performance over technical standards and is negotiation-based
- Interpersonal relationships have been crucial to the emergence of symbiotic relationships

Adapted from Liss, Louis, "Industrial Symbiosis: Kalundborg, DK" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)

The Manufacturing Quarter | Additional Studies

Physical Planning

- An analysis of existing traffic patterns, including an examination of traffic loads and innovative solutions regarding the organization of the traffic system
- An in-depth examination of landscape solutions for the development of the quarter and the remediation of contaminated areas (e.g., landfills)

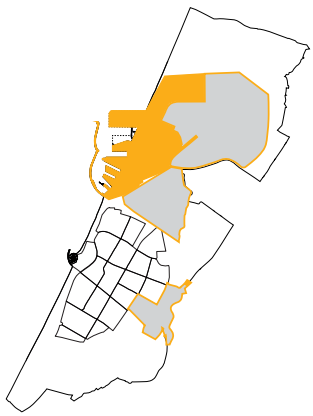
Policy

- An analysis of the quarter's economic clusters (specializations)
- An analysis of future industrial needs

3.5. THE PORT QUARTER

The Port Quarter | Existing Conditions and Plans

A new port is under construction adjacent to the city's original port. The back-of-the-port area, devoted to logistical operations, is underdeveloped and insufficiently planned. Freight traffic exceeds the capacity of the roads, resulting in congestion. There is an opportunity to redevelop the back of the port, to transform it into a cutting-edge logistics facility.

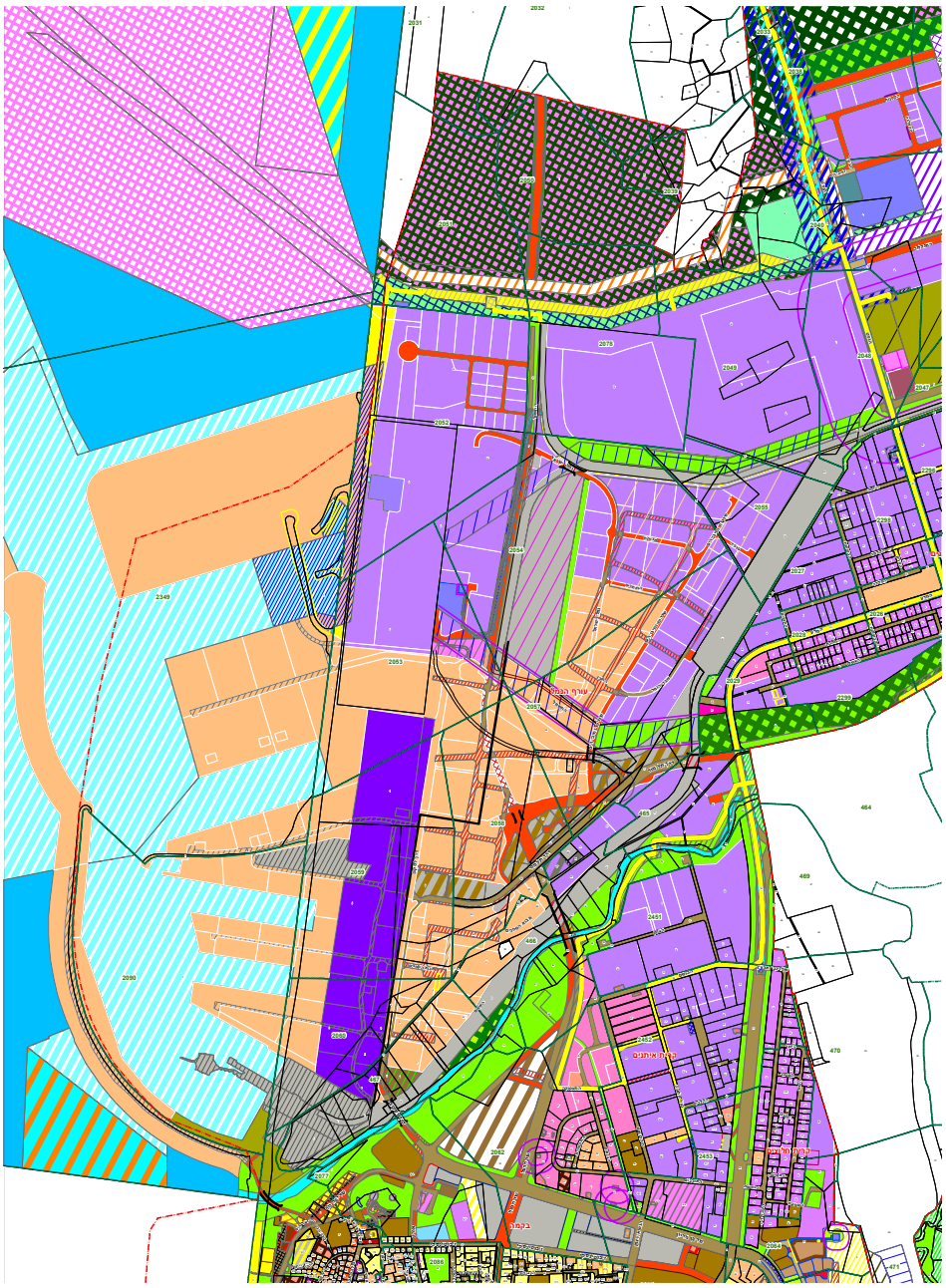


Port Entrance

Port

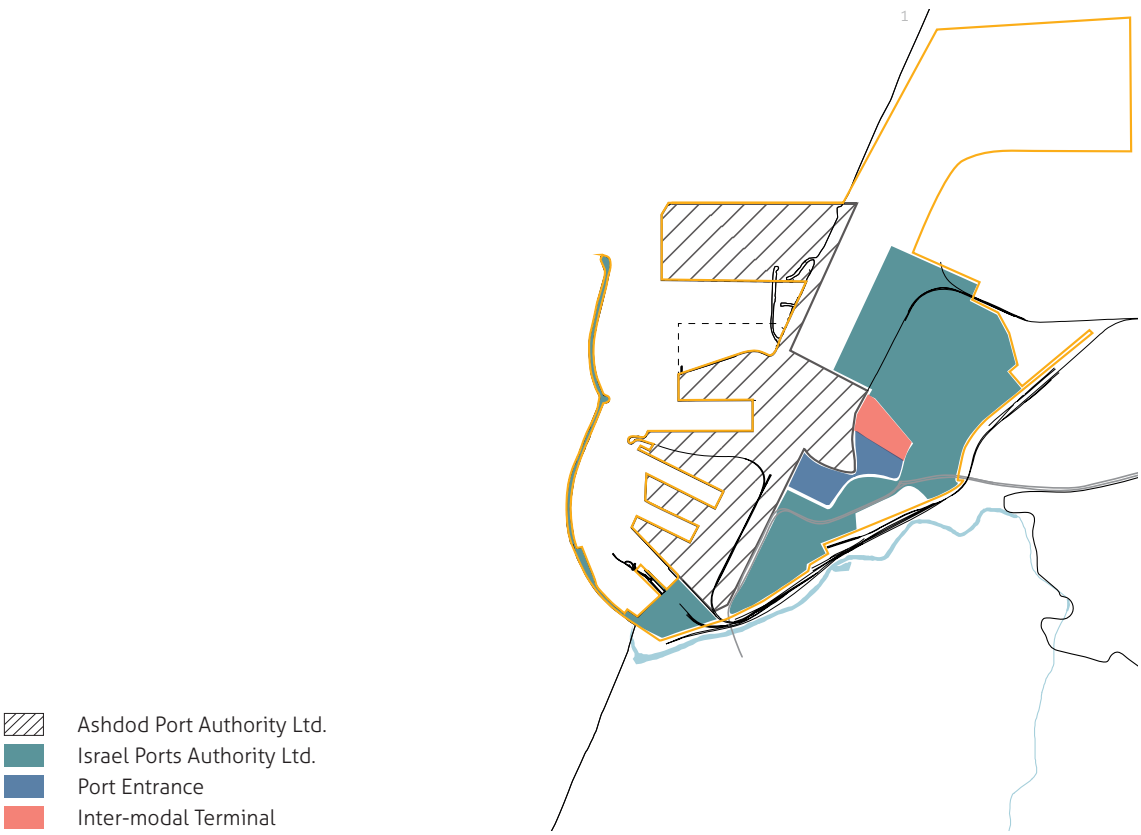
Back-of-the-Port Area

Back-of-the-Port Area



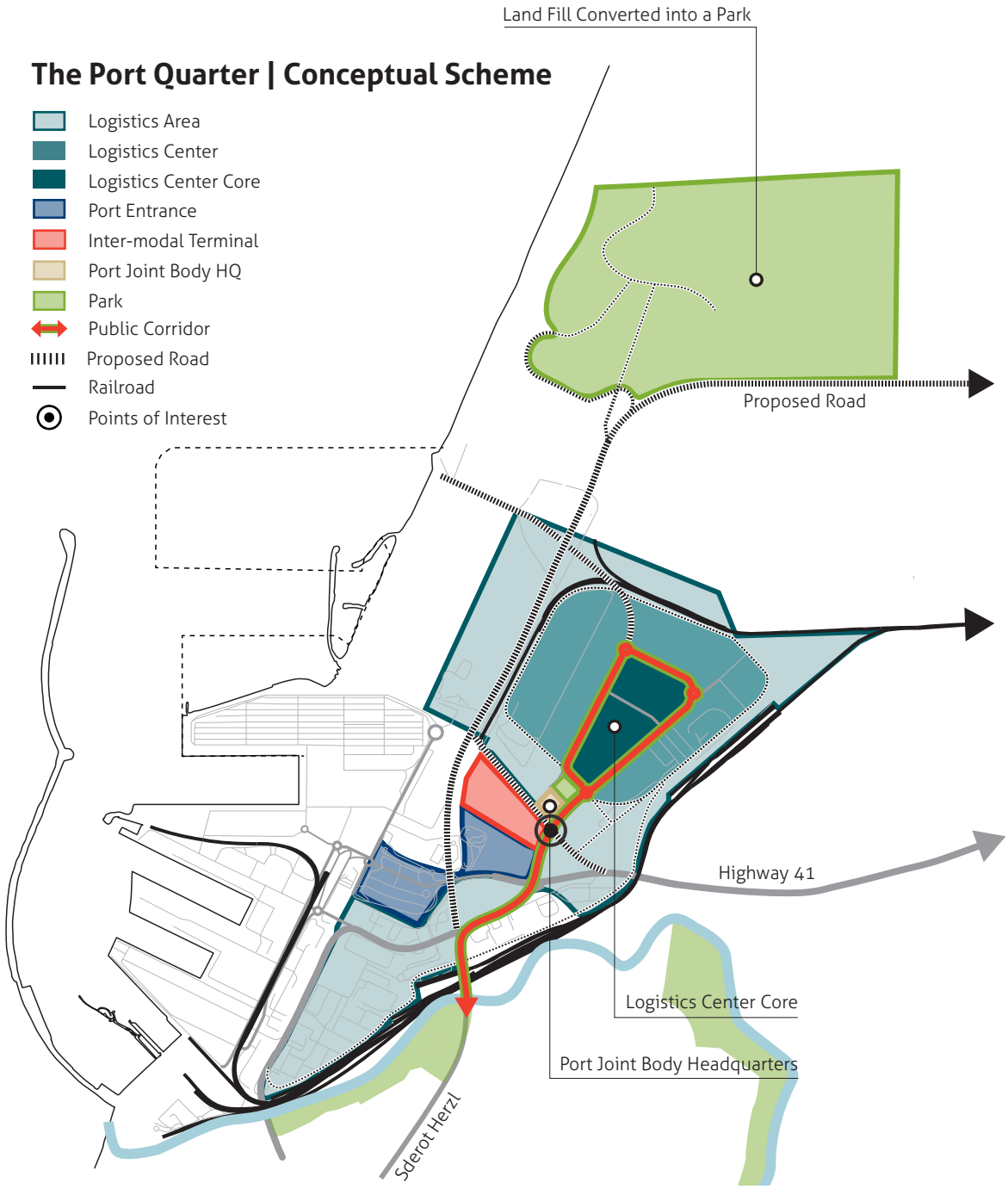
Port and Back-of-the-Port in City Land Use Plan

The Port Quarter | Vision



Develop a cutting-edge Port quarter that will be an integral part of the city's life and will support its economic growth and civic pride. Redefine the relationship between Ashdod's nationally important port, a vital economic artery for the city, and wider Ashdod through physical and policy interventions that will benefit the city's economy and residents. Through physical planning, make the port a cutting-edge facility, especially through the modernization of its logistical operations. Through policy, establish the statutory framework needed to move forward collaboratively.

Map from Bramli, Efrath and Noy, Kfir in *An Analysis of the Industrial Areas in Ashdod: Physical, Social, and Administrative Dimensions*, 2017 (http://www.industrialurbanism.com/report-ashdod-1)


The Port Quarter | Conceptual Scheme
Logistics Area
Logistics Center
Logistics Center Core
Port Entrance
Inter-modal Terminal
Port Joint Body HQ
Park
Public Corridor
Proposed Road
Railroad
Points of Interest
Land Fill Converted into a Park
Proposed Road
Highway 41
Logistics Center Core
Port Joint Body Headquarters
Sderot Herzl

The Port Quarter | Physical Planning and Policy Goals

Physical Planning

Port-City Relationship: Develop a high-quality, modern logistics center in the area to the back of the port; develop specializations through business recruitment, and cultivate expertise by offering educational programs related to logistics, import-export businesses, and shipping; open up the port and the logistics center to the public by connecting the port to the city's wider transportation network and by designing points of interest and landscapes that showcase and brand the port and logistics center

Transportation: Extend all modes of transportation into the quarter to better connect it to the wider city; focus especially on extending the BRT into the quarter; develop superior inter-modal links for freight (e.g., sea-to-road, sea-to-rail)

Landscape: Develop points of interest to showcase the port and the logistics center to the public and to brand the port and logistics center.

Education: Develop a center that will act as a headquarters for the quarter and offer educational resources and opportunities related to logistics, import-export businesses, and shipping.

Policy

Defining the Port-City Relationship: Define the model for the port's future development. Switching to the "landlord" model will have decisive economic and spatial effects on the port and the City of Ashdod. The "landlord" model is characterized by a mixed public-private orientation. In other words, the port authority functions as a supervisory and/or regulatory body and as a landlord, while port activities are carried out by private companies. Examples of ports that follow this model are the ports of Antwerp, New York, Buenos Aires, Singapore, Rotterdam and Barcelona. Establish a joint body to guide the future development of the port, to identify and respond to mutual economic interests, and to modernize logistics operations, especially as these tasks relate to or depend on trends in the wider region; develop specializations within the logistics area; draft a strategy to recruit businesses engaged in activities related to these specializations; draft a strategy to recruit businesses that comprise a logistics supply chain, and aim to extend, expand, and diversify this supply chain

Transportation: Market Ashdod's intermodal connectivity (sea – road – rail).

Education: Develop programs (degree or certificate programs, apprenticeships, etc.) related to logistics, import-export businesses, and shipping; partner with the Ministry of Education and local businesses

The Port Quarter | Physical Planning and Policy Tools

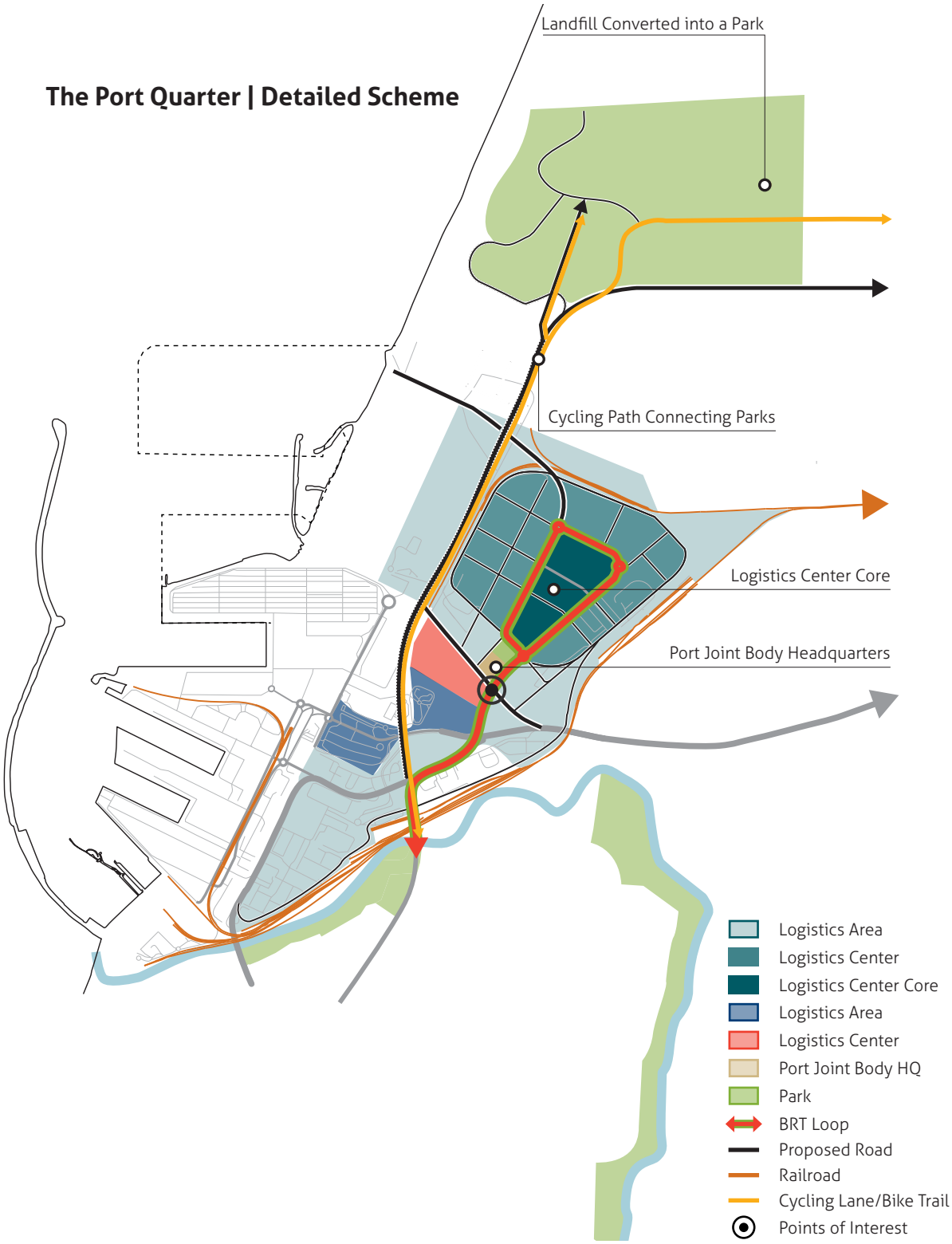
Physical Planning

- Set design guidelines for the quarter's main street blocks, and set an especially high standard for those streets that connect to major roads (e.g., Highways 4, 41)
- Encourage denser development in select areas through design guidelines

Policy

- Partner with the Ministry of Education to offer educational opportunities related to logistics, import-export businesses, and shipping
- Assist firms in the negotiation of bilateral agreements to share resources, especially in a symbiotic way (e.g., where one firm uses the by-products of another's manufacturing process) and with a focus on energy resources
- Draft a strategy to recruit businesses engaged in activities related to specializations
- Draft a strategy to recruit businesses that comprise a logistics supply chain, and to extend, expand, and diversify this supply chain

The Port Quarter | Detailed Scheme



The Port Quarter | Learning from Other Cities

City-Port Relationships: Rotterdam, NL and Hamburg, DE

Challenges

- A contraction in operations due to a shift in the global shipping industry led the Port Authority to release some land for redevelopment
- Some of the disused land included brownfields and abandoned areas
- Important industrial activities persist close to some of the newly available land

Kop van Zuid | *https://theportandthecity.wordpress.com*

Stadshavens | *https://theportandthecity.wordpress.com*

Strategies

- Two developments illustrate Rotterdam's varied approaches to waterfront industrial redevelopment: *Kop van Zuid* and *Stadhavens*
- At *Kop van Zuid*, the city converted browfields into a high-end, mixed-use development while retaining some of the vestiges of the port to conserve the area's industrial character
- At *Stadhavens*, because industrial activity will continue on about one-third of the site, the city and Port Authority aimed to develop complimentary uses and set conditions to support coexistence between industrial and non-industrial activity
- The Research, Design, and Manufacturing (RDM) campus, a collaborative, educational initiative between the Port Authority, the municipality of Rotterdam, Rotterdam University of Applied Sciences, and Albeda College on the site of the former Rotterdam Dry Dock Company, is the centerpiece of *Stadhavens*; the campus offers curricula in applied sciences and is a nexus for experimental projects and entrepreneurship
- Crucially, through its involvement in *Stadhavens*, the Port Authority took on a new role – real estate developer

Adapted from Sainz Caccia, Carlos Alberto, "City-Port Relationships: Rotterdam, NL and Hamburg, DE" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)

City-Port Relationships: Rotterdam, NL and Hamburg, DE

Challenges

- The port of Hamburg is the second largest port in Europe, yet it cannot bet expanded because it is more than 60 mi upstream and is completely surrounded by the city of Hamburg
- The 7, 200 ha port is mostly in Hamburg-Mitte, the same borough as the city's center; thus, industrial and urban uses compete for land
- Compatibility and coexistence between industrial and urban uses is imperative

HafenCity | *Port of Hamburg*

Hafengeburtstag, The Port's Birthday | *www.radiohamburg.de*

Strategies

- On the island of Wilhelmsburg an ongoing exhibition, IBA Hamburg, is the superstructure for roughly seventy innovative projects related to urban development and sustainability; exhibitions of this type are German tradition (search IBA for more information)
- IBA Hamburg has converted some disused industrial land into parks and sustainable infrastructure to 1) provide observation points where the public can view port activity and 2) buffer this activity
- The port of Hamburg holds a wide range of cultural events within the port to cultivate a positive image and to cement its ties with the city and the public
- The building of cycling infrastructure is an important component of the port's 2025 plan – this is one more way in which the port is cementing its relationship with the public; bicycle paths that already surround and cross the port are to be expanded
- At HafenCity, Hamburg is entirely redeveloping a part of the port into an expansive, mixed-use district; because HafenCity will retain some industrial activities, the city negotiated agreements between industrial firms and housing developers to manage noise levels

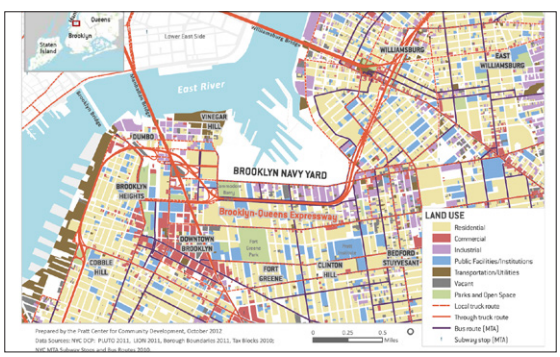
Adapted from Sainz Caccia, Carlos Alberto, "City-Port Relationships: Rotterdam, NL and Hamburg, DE" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/report-ashdod-2)

The Port Quarter | Learning from Other Cities

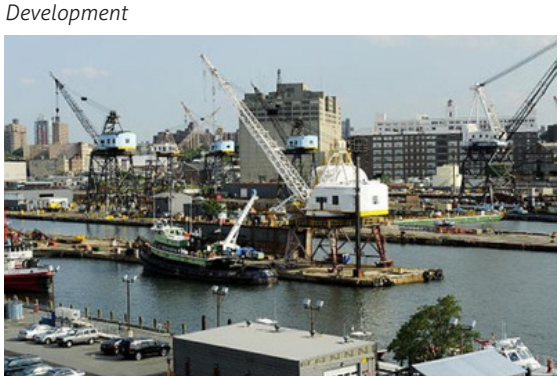
Industrial Ecology on the Brooklyn Waterfront: Brooklyn Navy Yard, USA

Challenges

- The Navy Yard reached its peak level of operations during World War II and contracted and declined thereafter
- The first attempt to redevelop and revitalize the port, which depended on the attraction and retention of an anchor tenant, failed when the anchor tenant filed for bankruptcy
- This attempt also involved the demolition of older buildings and the preparation of the site for an ideal opportunity, rather than an existing opportunity



Adjacent Land Uses | *Pratt Center for Community Development*



Brooklyn Navy Yard | *BNY*

Strategies

- Organizational restructuring and an emphasis on business diversity, the adaptive reuse of existing buildings, and the local context attracted 200 small- to mid-size business to the Navy Yard
- An important step in the redevelopment process was a building inventory that recorded: type, dimension, structural condition, architecture, floor load, floor height column spacing, internal circulation, reuse potential, and cost to rehabilitate
- The decision to focus on small business recruitment and to do so by advertising in local newspapers was strategic – these businesses did not mind operating in more austere buildings compared with large companies
- The Navy Yard management offered tenants support services, such as business strategy and legal guidance, and this cemented a business network centered on the Navy Yard
- The NYC Comprehensive Waterfront Plan divided the city's waterfronts into four categories and addressed each category separately
- The NYC Waterfront Rezoning Plan (1993) established design guidelines for waterfront redevelopment
- Vision 2020 outlines a "blue network;" a system to support water quality improvements and public access to the shoreline and waters

Adapted from Moinian, Max, "Industrial Ecology on the Brooklyn Waterfront: Brooklyn Navy Yard, USA" in *Global Case Studies*, 2017 (http://www.industrialurbanism.com/reportashdod-2)

The Port Quarter | Additional Studies

Physical Planning

- An analysis of land use with a focus establishing a land reserve for future growth (e.g., container storage growth)
- An analysis of accessibility and transportation networks (e.g., possibility of limiting container movement via road and expanding container movement via rail; goals for transportation times from port arrival to final delivery)
- A study on opportunities for growth within the context of stricter environmental laws and regulations
- A study of the port's wildlife and needs
- A study on how to cluster hazardous materials storage units; chemical industries, etc.

Policy

- An analysis of competing ports (SWOT)
- An analysis of trends and implications (e.g., global economic trends, political dynamics)
- Future cargo types and their logistical requirements (e.g., liquid bulk)
- An analysis of Ashdod Port's role in global supply chains (e.g., by product) and logistical gaps/needs by product and potential value-added services/businesses
- An analysis of industrial clusters (e.g., beyond the city, to include all of Israel) and how Port of Ashdod fits into/could fit into these clusters

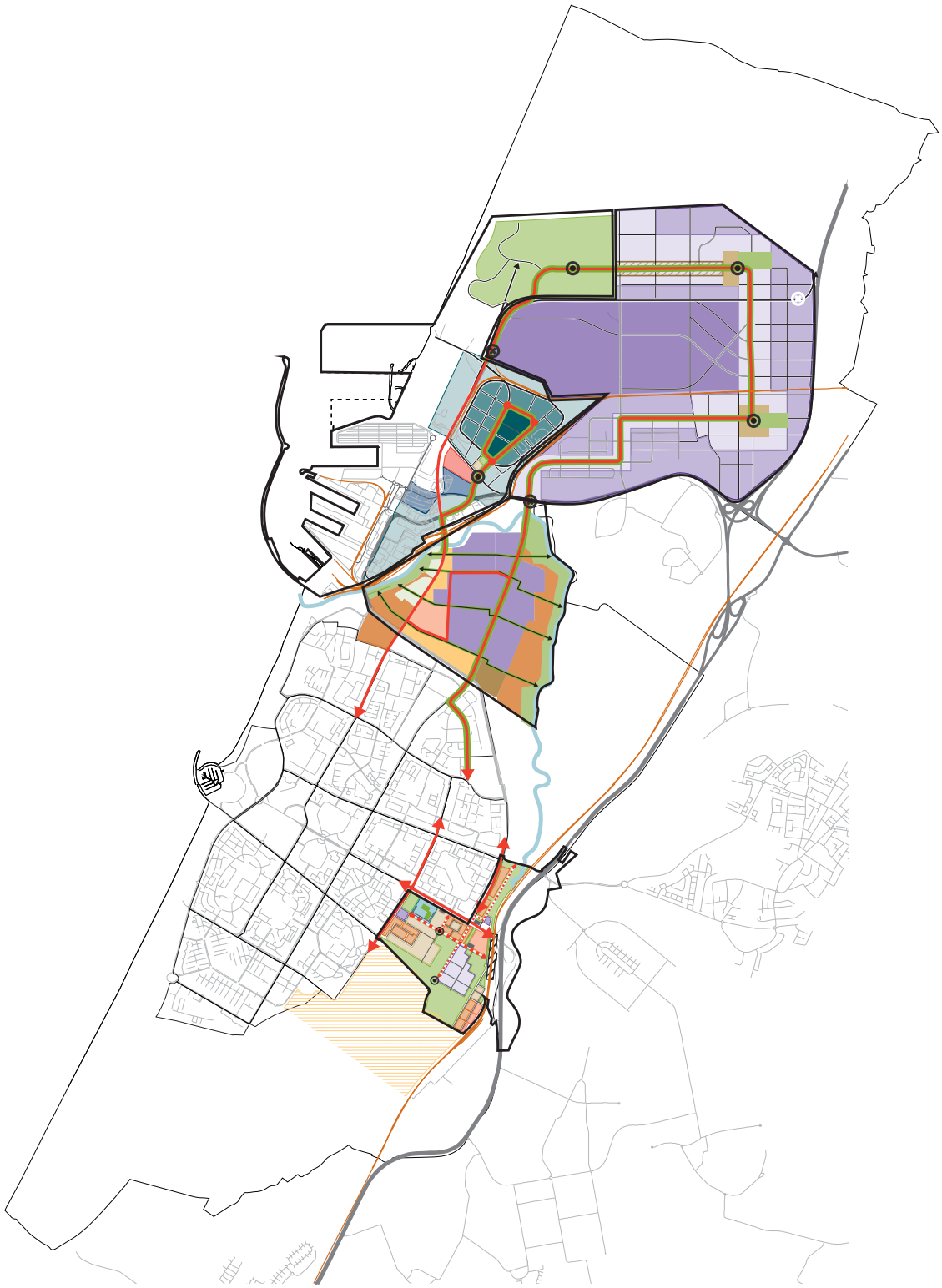
4. Summary: Ashdod as a Leading Manufacturing City

Ashdod is characterized by a wide range of industrial uses. In fact, about half of the city's area is allocated for industrial uses, from national-scale infrastructure (i.e., the port) to small-scale craft workshops. This industrial mix, characterized by uses at varied scales – from local to national importance – has wide environmental implications both for the industrial zones and the residential districts bordering these areas (existing and designated).

Centrally-located factories use hazardous materials extensively, such that their production processes results in emissions, ground contamination, and the discharge of industrial effluents into the ground and water that require special treatment. In addition, the nature of the industrial zones in the city is influenced by their proximity to unique natural sites. The Lachish River, which has been rehabilitated by the city through a multi-decade process, runs through the northern industrial zone and even divides the industrial zone into various functional areas. The Nitzanim Sand Dune Park and the Shikmim Valley will border the planned southern industrial zone. In addition, the existing port, the planned port, and refineries stretch along the northern coastal strip of the city. This feature of industry in Ashdod represents a challenge to preserving and adapting the interface between industrial uses, the landscape, and residential areas, especially in terms of sustainable development.

The first steps toward the implementation of this vision are: **(1) an agreement on a joint strategic plan between all the parties involved in the municipality; (2) the establishment of a joint body that will integrate planning and policy initiatives; (3) the definition of goals and stages of development; (4) the definition of additional data and studies required for the preparation of detailed plans; and (5) the formulation of and implementation of further strategy.**

At the outset of this, the 21st century, Ashdod should formulate and implement a thorough and courageous master plan for the development of its industrial areas. The topics that emerged in this strategic plan, the directions of thinking in terms of both policy and planning, and the need to bring together the leaders involved in the development of the city's industrial areas represent the first step in moving forward and implementing a comprehensive plan that will benefit the industrial sector and the city's residents alike. Manufacturing is not only an economic resource; it is a source of local and national pride and as such it is intrinsically tied to Ashdod's identity.



Bibliography

The American City Coalition and Utile Inc. (2011) Newmarket and Upham's Corner Planning Initiative: Concepts for a Walk to Work Community. Available at: http://tamcc.org/resource/newmarket-and-uphams-corner-planning-initiative-concepts-for-a-walk-to-work-community (accessed 15 May 2011).

Budovitch M (2017) Strategic Zoning and Creative Repurposing: Chicago, USA in *Global Case Studies*. Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).s

Boons F and Janssen MA (2004) The Myth of Kalundborg: Social Dilemmas in Stimulating Ecoindustrial Parks. Chapter 12 in *Economics of Industrial Ecology*, edited by Janssen MA and Van Den Bergh J. Cambridge, MA: MIT Press.

Etzkowitz H (2012) Triple Helix Clusters: Boundary permeability at university–industry–government interfaces as a regional innovation strategy. *Environment and Planning C* 30: 766 – 779.

Foderaro LW (2015) A Park to Sop Up Pollutants before they Flow into the Gowanus Canal.In *The New York Times*. Available at https://www.nytimes.com/2015/12/16/nyregion/sponge-park-in-brooklyn-to-treatpolluted-waters-of-gowanus-canal.html?mcubz=3 (accessed 4 September 2017).

Gibbs D and Deutz P (2007) Reflections on Implementing Industrial Ecology through Eco-industrial Park Development. *Journal of Cleaner Production* 15: 1683 – 1695.

Greater Duwamish Planning Committee (1999) Greater Duwamish Manufacturing and Industrial Center Plan. Available at: http://www.growseattle.com/wp-content/uploads/2010/05/PDF1_MIC_PLAN.pdf (accessed 4 September 2017).

Hurley AK (2017) What Should Cities Make? In *City Lab* Available at: https://www.citylab.com/work/2017/02/what-should-cities-make/516894/ (accessed 20 February 2017)

International Building Exhibition (IBA) Hamburg Available at: www.iba-hamburg.de/en/iba-in-english.html (accessed 4 September 2017).

Jacobsen NB and Anderberg S (2005) Understanding the Evolution of Industrial Symbiotic Networks: The Case of Kalundborg. Chapter 11 in *Economics of Industrial Ecology*, edited by Janssen MA and Van Den Bergh J. Cambridge, MA: MIT Press.

Klatskin A (2014) Changing Manufacturing. Industrial Urbanism Symposium at the Massachusetts Institute of Technology. Available at http://www.industrialurbanism.com/ (accessed 12 July 2016).

Liss L (2017) Industrial Planning and Innovation: Philadelphia, USA in *Global Case Studies* Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).

Liss L (2017) Industrial Symbiosis: Kalundborg, DK in *Global Case Studies*. Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).

Markillie P (2012) A Third Industrial Revolution in *The Economist*. Available at http://www.economist.com/node/21552901 (accessed 13 July 2016).

Moinian M (2017) Environmental Remediation on the Waterfront: Gowanus Canal, USA in *Global Case Studies*. Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).

Moinian M (2017) Industrial Ecology on the Brooklyn Waterfront: Brooklyn Navy Yard, USA in *Global Case Studies*. Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).

Murray F (2014) Changing Manufacturing. Industrial Urbanism Symposium at the Massachusetts Institute of Technology. Available at http://www.industrialurbanism.com/ (accessed 12 July 2016).

Nathan M and Overman H (2013) Agglomeration, Clusters, and Industrial Policy. *Oxford Review of Economic Policy* 29(2): 383 – 404.

Reynolds E (2014) Changing Cities. Industrial Urbanism Symposium at the Massachusetts Institute of Technology. Available at http://www.industrialurbanism.com/ (accessed 12 July 2016)

Sainz Caccia CA (2017) City-Port Relationships: Rotterdam, NL and Hamburg, DE in *Global Case Studies*. Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).

Schwab K (2015) The Fourth Industrial Revolution: What it means and how to Respond in *Foreign Affairs*. Available at: https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution (accessed 28 February 2017).

Taft Mueller Z (2017) Aligning Social and Physical Strategy, Boston, USA in *Global Case Studies*. Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).

Taft Mueller Z (2017) Establishing a Unified Front Against Encroachment: Seattle, USA in *Global Case Studies*. Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).

Tamásy C (2007) Rethinking Technology-Oriented Business Incubators: Developing a Robust Policy Instrument for Entrepreneurship, Innovation, and Regional Development? *Growth and Change* 38 (3): 460–473.

Wolman H and Hincapie D (2015) Clusters and Cluster-Based Development Policy. *Economic Development Quarterly* 29(2): 135–149.

Yin Z (2017) From Segregation to Integration: Jurong, SG in *Global Case Studies*. Available at: http://www.industrialurbanism.com/report-ashdod-2 (accessed 4 September 2017).

Youtie J and Shapira P (2008) Building an Innovation Hub: A case study of the transformation of university roles in regional technological and economic development. *Research Policy* 37: 1188-1204.