

# Evolution of Industries



Glass works, Midland, Indiana, USA 1908. Photo by Lewis Hine, U.S. Library of Congress

1908



Hamilton Watch Co., Lancaster, PA, USA 1936. Photo by Lewis Hine, U.S. Library of Congress

1936



Machine gun production, Flint, Michigan, USA 1942. Photo by Ann Rosener, U.S. Library of Congress

1942



Virginia-Pocahontas Coal Co., Richlands, VA, USA 1974. Photo by Jack Corn, U.S. National Archives

1974



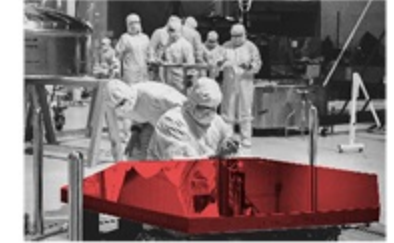
Quill-winding operation, Jacquard-Weaving Mill, Paterson, NJ, USA 1994. Photo by Cooper Martha, U.S. Library of Congress

1994



Sewing Factory, 2006. Photo by Maruf Rahman (CC)

2006



Clean room at NASA's Goddard Space Flight Center, 2015. Photo by Chris Gunn, NASA

2015



Hawthorn Farm, Hazardville, CT, USA 1917. Photo by Lewis Hine, U.S. Library of Congress

1917



Frankford Arsenal, Philadelphia, PA, USA 1940. Photo by Unknown, U.S. National Archives

1940



Kumsung Radio Factory, South Korea 1962. Photo by Unknown, Korean National Archives

1962



Machinery Production, Wittenberg, Germany 1985. Photo by Wolfried Paetzold, German Federal Archive

1985



Food Factory, Brazil 2010. Photo courtesy of Nestle (CC by 2.0)

2010



Human-Robot Collaboration, 2019. Photo courtesy of Universal Robots A/S

2019

# Industrial Typologies



## Street

A system of adjacent industrial/workshop units along a street

## Complex

A unit consisting of several buildings that share a common space

## Campus

A system of buildings in a defined space.

## Box

A big box with internal organizational flexibility.

## Tower

A multi storey autonomous structure.

# Industrial Type : Patterns, Order & Geography.

One of the significant transformations witnessed in the 20th century, profoundly impacting both urban living and production dynamics, was the decrease in automobile commuting and truck shipping costs, coupled with the subsidization of highway infrastructure. This led to a widespread horizontal expansion of industrial zones, resulting in significant implications.

The evolving industrial landscape became heterogeneous, consisting of three distinct spatial categories: "**integrated**", "**adjacent**" and "**autonomous**". Each category influences urban life and economic demands differently, with some cities incorporating multiple types within their administrative boundaries. The adoption of specific types is often influenced by historical, cultural, political, and economic considerations.

## Type

## Structure

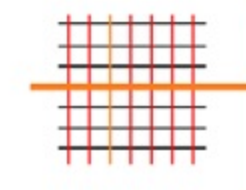
## Land use

### Autonomous



This type is characterized by large-scale zones occupied by uniform industrial buildings and surrounded by various physical boundaries.

### Unified



### Zoning

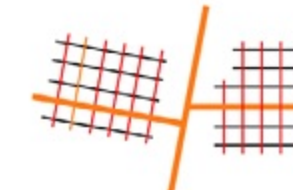


### Adjacent



The organizational outline of the adjacent type is based on zoning and the separation between living and working.

### Parallel



### Partial zoning



### Integrated



The key features of this type is symbiosis between living and working.

### Layered



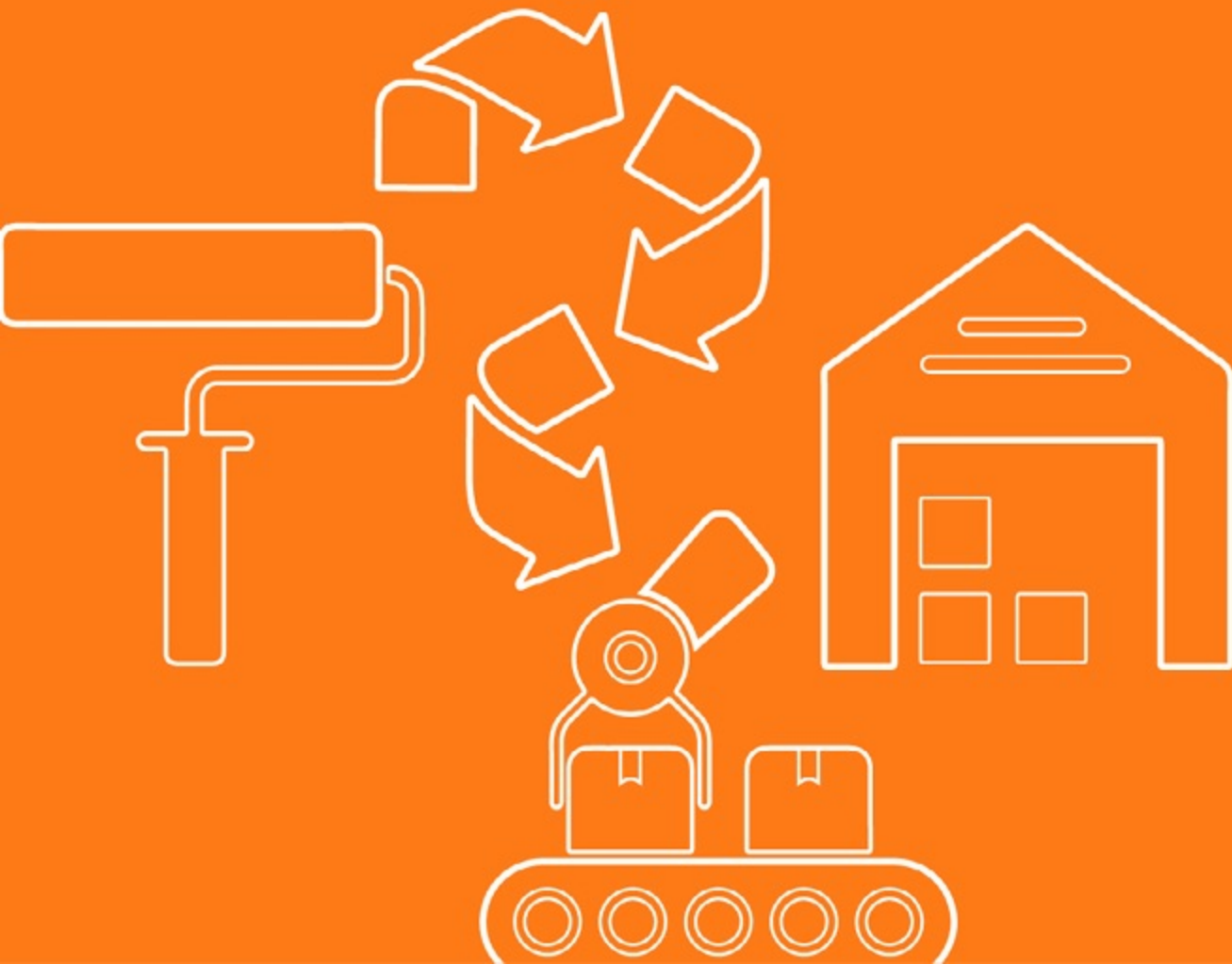
### Mixed





# Technology and people in a symbiotic environment

Industries exploring to what extent automation and augmentation of human labor will affect current employment numbers, but rather under what conditions the global labor market can be supported towards a **new equilibrium** in the division of labor between human workers, robots.



## Implementable Fields

Synchronization allows diverse operations to function concurrently in the same space without interference, optimally sharing resources such as land, services, and infrastructure. This includes integrated living and office spaces, diverse mobility options, and more.

It's based on principles like efficient land use, integrating housing and work, reducing commutes, and maximizing use throughout the day. Overall, it's a new prototype emphasizing integration.



### Creative

Recording studio, stage/ prop design, graphic design, glass blowing, fashion design



### Production

3D printers, furniture restoration, shop/events display manufacture, medical prosthetics, VR Hardware and Software



### Utility

Car repairs, car rental, upcycling, kitchen installations, building supplies



### Distribution and Storage

Art storage, final mile logistics, parcel depot, food wholesalers, self-storage







# The Roadblocks of Manufacturing: Charting a Path Forward

+ Scope of change through Design interventions

## **ECONOMY**

Increasing global competition for investments and projects between cities and regions.

## **SOCIETY**

Unemployment as a side effect of globalization and the transfer of production to developing countries

## **PLANNING**

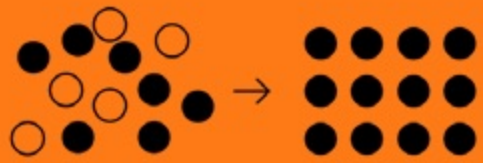
Demographic growth along with a trend toward rapid urbanization.

## **ENVIRONMENT**

Changes in consumption and the cost of energy in the transportation of goods.

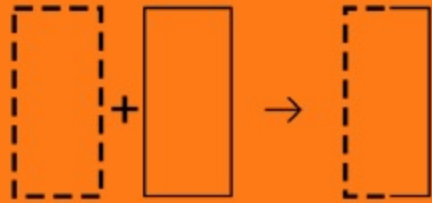


# Strategies in Industrial Development



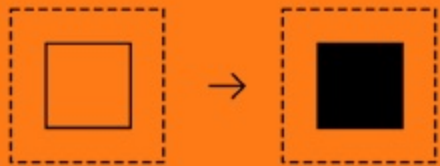
## BALANCE

Focuses on regional development at under developed areas. Policies include local context requirements, tax relief, financial incentives.



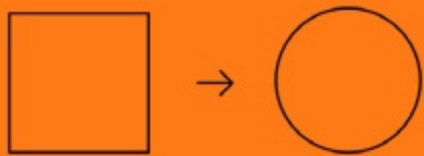
## COLLABORATION

Focuses on regional innovations and stimulate growth. Policies include R&D investment, university-led R&D, entrepreneurship



## SPECIALIZATION

Focuses on cluster development and make a place synonymous with an industry. Policies include Formation of trade associations; workforce development, marketing and branding, industrial ecology, eco-industrial parks



## CONVERSION

Focuses on Industrial conversion by redeveloping disused industrial facilities and land. Policies include Tax relief, financial incentives.



# KEVIN LYNCH COGNATIVE APPROACH

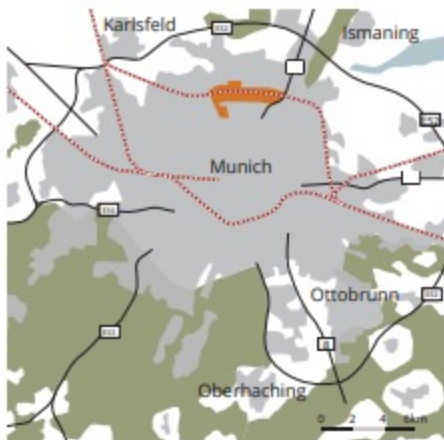
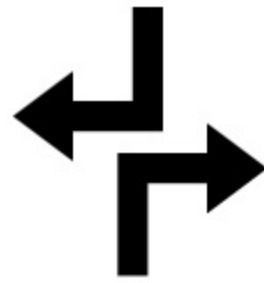
pathways  
edges  
nodes  
districts  
landmarks





**Campus pathways**  
 foster collaboration  
 and safety,  
 enhancing the  
 sense of belonging  
 among the  
 workforce.

[Source: National Institute of Environmental Health Sciences]



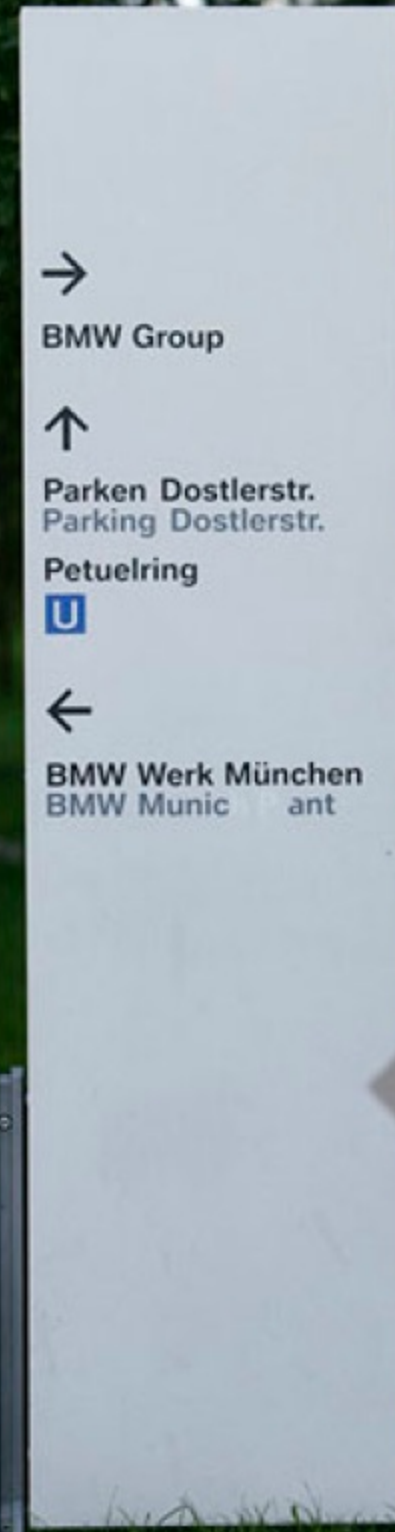
Location



Relationships



BMW Werk München,  
 München, Germany



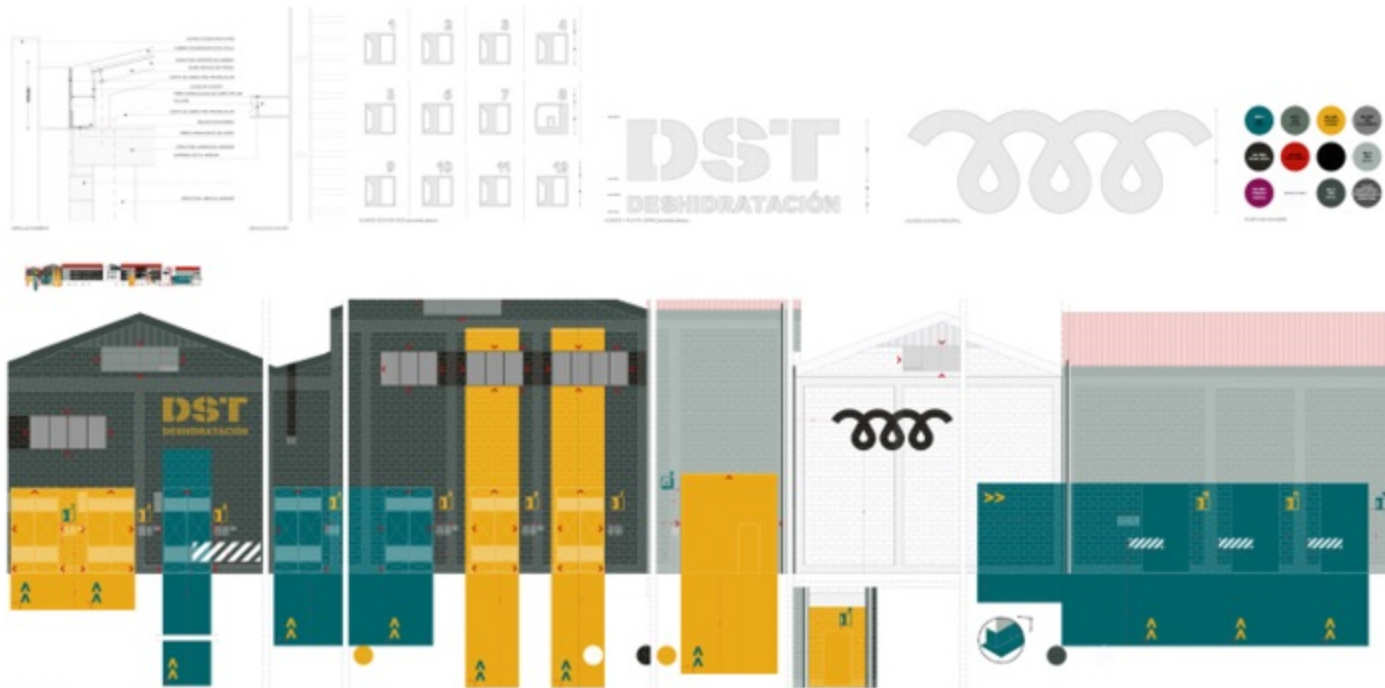


Clear **edges** on campus not only enhance focus but also serve as points of interaction, facilitating connections within the workforce.

[Source: Journal of Environmental Psychology]



Villapérez Wastewater Treatment Plant,  
Oviedo, Spain





Active **nodes** within the campus promote innovation and connectivity among the workforce, fostering a collaborative work culture.

[Source: American Journal of Public Health]



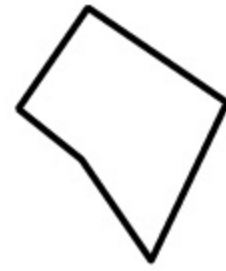
Dongshanshaoye Park,  
Guangzhou, China



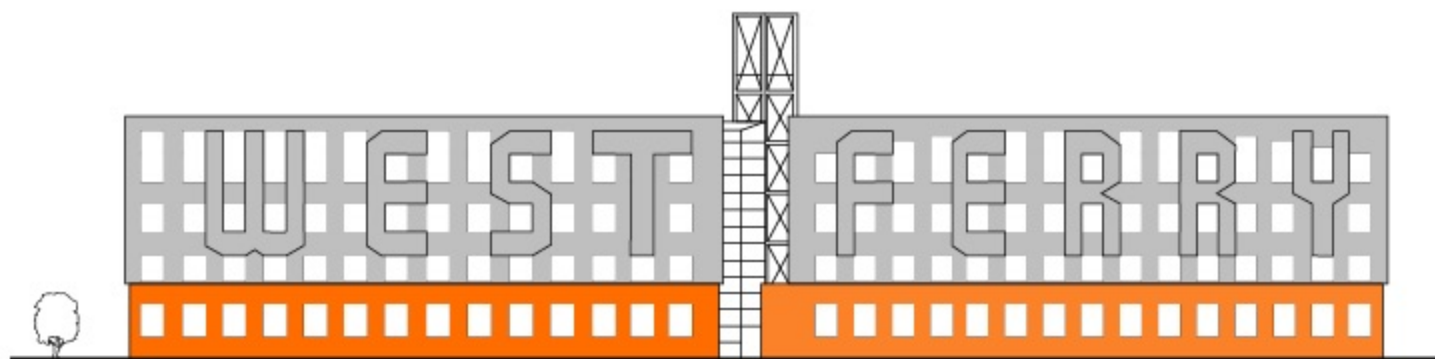


**Cohesive districts**  
with unique  
identities enhance  
community pride,  
social ties, and  
collective action.

[Source: Journal of Urban Design]



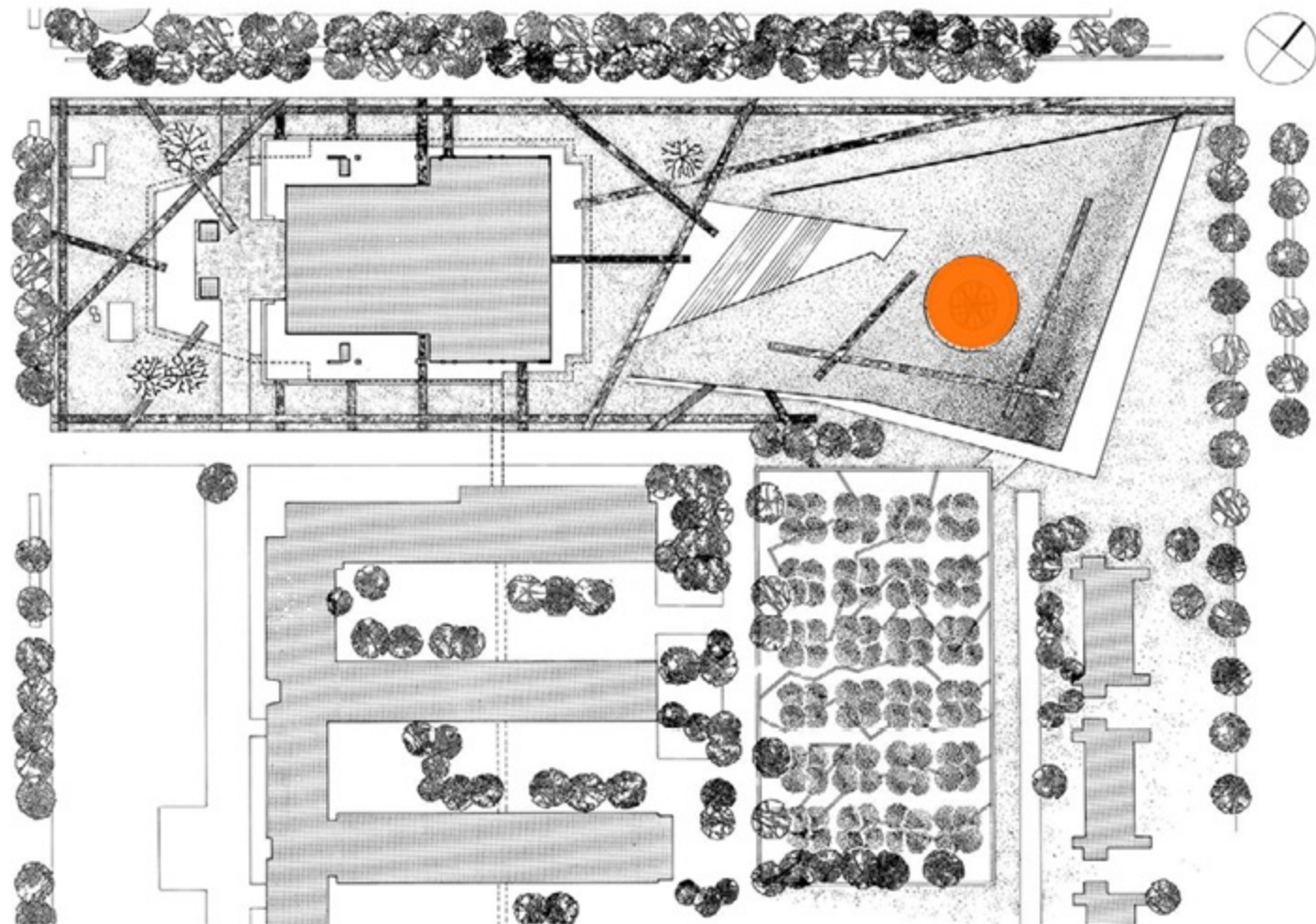
Westferry Studios,  
London, UK





**Distinctive landmarks**  
on campus contribute  
to a strong sense of  
identity and satisfaction  
among the workforce,  
reinforcing their  
connection to the  
workplace.

[Source: Journal of Planning Education and Research]



TU Delft Library,  
Delft, Netherlands

