

ZONING PRACTICE

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PRACTICE INDUSTRIAL ZONING



The Industrial Evolution

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Industrial land uses have been evolving in response to new technologies and market trends for many years now. While some manufacturers and other heavy industrial operations still need large parcels of land in more isolated areas served by rail, truck routes, or waterways, many industrial uses want to be closer to urban activity centers. This is the result of the emergence of scaled-down industrial uses, with few to no outside impacts, and new markets for locally produced artisan goods.

With this change, zoning codes will need to adapt to fit these new types of uses. Codes will need to acknowledge and define new uses, assign these uses to existing or newly established districts, and apply development standards both to mitigate any impacts and to allow these uses to take advantage of reuse and redevelopment opportunities.

This article explores how communities have updated their zoning codes to accommodate the evolution of industrial land uses. The following sections highlight the key features of mixed-use industrial districts, explore a range of distinct urban industrial uses, and discuss how one mid-sized city has embraced a new approach to industrial zoning.

MIXED-USE INDUSTRIAL DISTRICTS

One of the more common revisions to ordinances is the creation of industrial mixed-use districts. The inclusion of such districts does not negate the need to include more traditional industrial districts; industrial mixed-use districts actually work to support traditional industrial districts by protecting valuable industrial land area from encroachment by nonindustrial uses. Without such a district, communities may revise the use permissions of a light industrial district, for example, to allow more commercial uses that have shown interest in locating within select light industrial zoned areas. However, this then opens up all light

industrial areas to encroachment of commercial uses that can create conflicts in areas that are predominantly active industrial uses, and also remove valuable land from the market that is best suited for industrial.

Large Footprint Industrial-Commercial Districts

Over time, industrial mixed-use districts have moved away from a single type of district to a gradient that allows for communities to apply them and tailor them to their specific situations. Initially, these districts were targeted at industrial areas that were transitioning away from strictly manufacturing to allowing for more commercial uses. The most common cited example was that of encroachment by more intensive commercial uses that needed significant open footprint buildings, such as “doggy day care” and indoor soccer fields, in established industrial areas. These types of districts generally work with the existing industrial standards but expand the use permissions so that a greater variety of nonindustrial uses are allowed.

Industrial/Limited Office Districts

Industrial mixed-use employment-oriented districts are another variety that address two

issues that traditional industrial areas have faced. First, industrial development often requires significant land area to function, including large open floorplates and areas of outdoor storage. The other issue is that office uses often encroach into industrial areas, taking advantage of the available land and reducing opportunities for new industrial uses. This type of district tackles these issues with a more prescriptive approach; it allows for office uses, but only if a certain percentage of each development area is reserved for industrial uses.

Employment-Oriented Districts

Additionally, some communities have integrated new mixed use industrial districts that emphasize job creation into their zoning codes. The use permissions allow for a wide variety of compatible uses that typically have high employment densities, such as light industrial and industrial parks, office, and research and development.

Reuse and Redevelopment Districts

Finally, industrial mixed-use reuse and redevelopment districts embody the full mixed-use concept—allowing for industrial, commercial, and residential uses. These are often targeted at older manufacturing areas that are no longer suited for traditional

TABLE 1. EXAMPLES OF MIXED-USE INDUSTRIAL DISTRICTS

Jurisdiction	State	District Name	Citation
Denver	CO	Industrial Mixed-Use Districts	§9.1
Eugene	OR	Mixed Use Employment Zone	§9.2405
Milwaukee	WI	Industrial-Mixed	§295-801.4
Providence	RI	Mixed-Use Industrial District	§800.A
Rockville	MD	Mixed-Use Employment	§25.13.02
St. Paul	MN	Transitional Industrial District	§66.511
St. Petersburg	FL	Employment Center Districts	§16.20.130
Tacoma	WA	Commercial-Industrial Mixed-Use District	§13.06.040.C.5
White Plains	NY	Light-Industrial-Mixed Use	§5.5.1.12

industrial uses and can accommodate a variety of uses, while allowing existing industrial uses to continue operations.

The uses can take advantage of older structures, such as former warehouse and industrial buildings, which are structurally compatible with the demands of a variety of new types of uses but functionally obsolete for their original intended users. Furthermore, communities typically apply this type of district to areas where the new types of “maker” urban industrial uses concentrate, as described later in this article, taking advantage of the open floorplate of former manufacturing uses. These districts often allow for higher intensity redevelopment, such as new taller multifamily or mixed-use structures.

R&D AND MIXED-USE DEVELOPMENT

Research and development uses are moving away from suburban research or office parks and into more urban areas. A hybrid of light industrial and office uses, the use combines office space with laboratories and prototyping and testing facilities. R&D is distinguished by its focus on new technologies, robotics, biotechnology, information technology, pharmaceuticals, and the like. Because of this, these uses have become a significant part of the larger land-use category of urban industrial.

One of the characteristics of R&D that influences its location within the urban fabric is the makeup of the workforce. Many R&D companies seek to attract recent graduates who have entered its component fields and prefer to live near and within mixed-use, urban centers. Therefore, these uses are increasingly seeking out locations associated with or in close proximity to urban university campuses.

From a zoning perspective, it is important to include R&D uses within higher intensity mixed-use districts and specialized areas, such as a downtown. Because these uses incorporate industrial processes, they should not be interpreted as an office use. By defining R&D as a distinct use, communities can allow it in a wider range of districts. Generally, these uses fit best in districts with greater height allowances.

Finally, because of the sensitive nature of some R&D uses, some communities exempt these uses from certain development standards. For example, while many codes require public open space connections between developments and the public realm, the secure nature of some of these facilities may be incompatible with public open space. Offering a special exemption—such as private open space for employees only—to R&D uses that can demonstrate that their site must be secured allows the community to continue to implement its efforts to “green up” and support the urban tree canopy without compromising security measures. In another example, design standards may require multiple entries along street frontages to create a pedestrian-friendly streetscape. This may not be feasible for security reasons, so alternatives such as increased facade modulation or ground-floor transparency should be offered.

THE MAKER USES

A series of urban industrial uses, often referred to as “maker uses,” have become very popular in zoning codes and land-use policies as they are seen as ways to bring vibrancy to a neighborhood and a city. Becoming a “maker city” is often seen as a goal; to accomplish it, the code must include the right range of “maker uses.” While the definition for a “maker use” is still fluid, the term generally refers to small-scale specialty uses that are oriented toward more traditional artisanal products, including food, household items, and clothing.

Microproduction of Alcohol

Colloquially in the public and when planners discuss the use, most refer to the microproduction of alcohol in the shorthand of “microbrewery,” but for zoning purposes “microproduction of alcohol” is a more flexible term. Today, it is not only beer that is produced but a variety of beverages—beer, wine, spirits, cider, and mead.

Zoning standards should specifically allow for features that are common to these uses, including tasting rooms, restaurants, and retail areas for beverages manufactured on-site and establishment-related promotional items,

like prepackaged beverages and branded clothing and glassware.

Some communities include use standards to ensure that the “micro” part of the use has parameters. For example, the zoning code may require a bar, tasting room, or restaurant, or it may limit the square footage of the production area. These standards are intended to ensure compatibility with the surrounding mixed-use environment. Some codes may also refer to the brewing capacity of the facility in order to ensure that it is “micro,” though this has fallen out of favor since other codes that regulate the production of alcohol may set their own limits on that capacity. Often, the parameters are district specific, with a tighter restriction on the size of production facilities in more commercial-oriented areas than in industrial mixed-use or industrial districts.

Artisan Industrial

Artisan-related industrial processes, such as small-scale screen printing, furniture making, and woodworking, have become more common uses and often help communities establish a “creative identity.” These uses do not usually meet the threshold of a light industrial definition—they require less square footage of working area, have few outside impacts, and allow customers to visit the studio to view wares and make purchases.

Artisan industrial uses are ideal for industrial mixed-use districts, such as the reuse and redevelopment districts described above; however, they may also fit into select commercial areas with conditions. Some basic standards are usually appropriate to mitigate any impacts. These standards typically require all work and storage to be conducted indoors and impose limitations on the gross floor area depending on the district in which they are allowed.

Specialty Food Service

Specialty food service is the preparation, processing, or packaging of specialized food products then offered for sale on the premises. Examples include coffee roasting and producing specialized artisanal products like honey, olive oil, cheese, and candy. Because all processing is completely enclosed and there are no outside impacts,



➡ The Moog Factory and Store, which manufactures and sells synthesizers, is an example of an artisan industrial use integrated into the downtown fabric of Asheville, North Carolina.

they can fit well even into neighborhood commercial areas. Specialty food service allows customers to purchase the products on-site and often has areas for consumption.

Like the microproduction of alcohol, these can be a more intensive production use depending on scale; limitations on square footage of production space are often included within the use standards tailored to the scale of different districts. This is particularly important for specialty food services because these uses are often allowed within some of the less intense commercial areas located in close proximity to residential neighborhoods.

Industrial Design

Industrial design determines the form and function of consumer products, or components of such products—such as electronics products, furniture, housewares, and a wide variety of products—prior to manufacturing those products at scale. Consequently, industrial design uses bring together design, marketing, and brand development of various products, and they integrate fields such as art, business, science, and engineering. While larger companies may have industrial design divisions integrated into their operations,

communities generally define industrial design as a distinct use in their zoning codes to accommodate independent designers who operate on a smaller scale. And with 3-D printing becoming more accessible, demand for this use is likely to increase.

Communities that regulate industrial design as a distinct use typically permit designers to create prototypes and sample products but prohibit mass manufacturing and on-site sales. The impacts of such uses do not differ from that of an office, but the definition of office is usually not inclusive enough to allow the use. Furthermore, based on the districts within a municipality, this type of use may be allowed in a broader range of districts. For example, where a traditional industrial district may not allow offices, this type of use may be welcome.

Commercial Kitchens

In addition to the needs of food trucks for off-site preparation facilities, culinary home businesses often need to move out of private kitchens into more professional facilities, often because of health department regulations. Therefore, the use of commercial kitchen should be included in ordinances. This is a certified shared commercial kitchen in which individuals or businesses prepare

value-added food products and meals, usually paying an established rate to lease a space that is shared by others. This type of urban industrial use does not need to be relegated to purely industrial districts; it can be integrated into some commercial districts that allow some higher intensity uses. Many business owners engaged in small-scale food production find these locations more desirable because they live closer to urban centers than to remote industrial areas.

Commercial kitchens are also evolving from strictly a production facility where the food is taken off-site, whether to a food truck or a farmers market or to be shipped, to include delivery-only restaurant services. Called “cloud kitchens” or “ghost kitchens,” these uses have specific needs related to employee and delivery driver parking demands and driver waiting areas. Because of the high traffic, this urban industrial use is appropriate for industrial, industrial mixed-use areas and heavy commercial districts with adequate parking areas.

Food Truck Stations

One of the most recent trends for new urban industrial uses are support services for food-related businesses. A new use that has emerged to support a thriving food truck scene is the food truck station. These facilities offer overnight parking, cleaning areas, and commercial kitchens or commissaries for food preparation. Because these stations are land intensive and may have extended hours of operation, they should be targeted to industrial and industrial mixed-use areas on the edges of more urban commercial areas.

CANNABIS CULTIVATION CENTERS

While this use is still in flux due to state and federal regulations, many cities are already contending with cannabis cultivation centers. In states with legal medical or recreational cannabis, indoor growers must typically comply with extensive state regulations, including detailed standards for security and operation. However, cities are still able to specify permissible zoning districts for these uses and adopt standards to mitigate potential impacts.

Some cities that allow cultivation centers, such as Las Vegas, permit these

uses in commercial and industrial districts (§19.12.070). One of the benefits of the heavy regulation placed upon these uses is that any impacts are required to be self-contained. All activity must occur within an enclosed building with heavy security measures so that there are no perceptible outside impacts. For this reason, they make good neighbors to other uses. Cities should monitor how these uses are being allowed and regulated to see if they are appropriate for districts outside of the true industrial zones and function in the same way as other urban industrial uses.

DISTRIBUTION INCHING CLOSER

Warehouse and distribution uses impact communities of all sizes. While sprawling facilities operated by megaretailers like Amazon and Walmart are a current planning concern and create their own set of unique issues, smaller distribution facilities are also in demand. Distributors are finding ideal locations in suburban communities near major urban centers and distribution pathways such as airports. Therefore, when these distribution centers are closer to urban centers and communities like first-ring suburbs, there are two areas of regulation that require special attention:

1. Ensuring that the regulations are appropriate for the types of structures and their operational needs
2. Establishing appropriate transitions and buffers to mitigate their impacts on adjacent often incompatible land uses

The industrial regulations in suburbs often reflect older manufacturing needs rather than those of distribution. Many of these structures are built for maximum flexibility on the interior—spaces can be split and merged as needed for single or multiple users. One of the most important controls for distribution centers is height. A maximum height should be established to maintain flexibility for the users. As clear heights of 32 feet to 36 feet are generally considered standard for industrial spaces, a maximum building height of 50 feet provides a reasonable limit.

Because these spaces are flexible in terms of the number of users that may be present and because of how distribution functions, care should be taken in terms of how loading spaces are regulated. Older

codes may look at loading as a single dock leading to a single loading door, planned to occur on one side of a building. However, cross-dock layouts have become more efficient for many distribution centers. A cross-dock layout is a logistics technique that facilitates coordinated receiving and shipping functions. Shipments are transferred from inbound trailers at the receiving dock, sorted in the central area of the facility, and then “cross over” through the facility to the outbound trailers on the other side. The shape of a cross-dock is determined by the amount of land area available but are most often seen in the shape of an “I,” with other shapes such as “L,” “U,” “T,” “H,” and “E” also used.

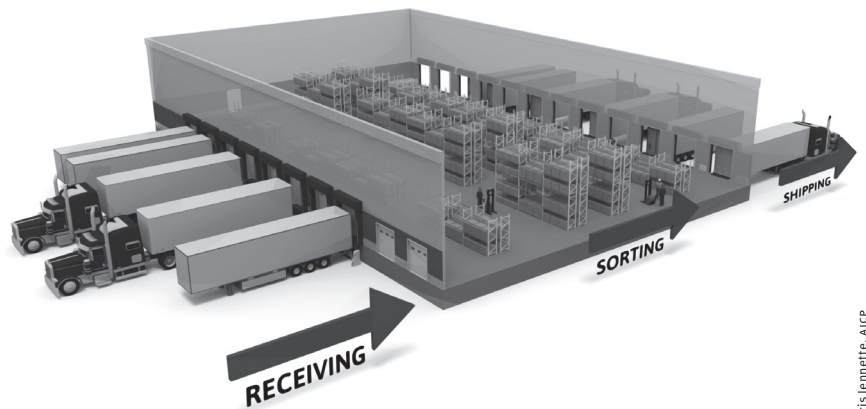
Because distribution centers that use cross-dock loading represent a more intense land use, communities should require site plan review to confirm that the center is designed to ensure safe circulation. In addition, cross-dock layouts may create conflicts with more traditional screening and buffering requirements. In order to screen these areas from view, many ordinances require or encourage loading areas to be located to the rear of structures or even prohibit these areas adjacent to residential uses or districts, which works well for traditional commercial uses that hide loading in the back or more traditional

manufacturing companies that schedule deliveries and shipping separately.

A cross-dock layout will have loading docks on two sides of the building. Most often, they need to be oriented along the long way of the building, which may place at least one set in view from the right-of-way. Therefore, standards of location screening need to be evaluated. Finally, as may be apparent, a design that accommodates two sets of loading docks creates more impervious surface on the site, so stormwater management should also be incorporated as part of the site plan review.

In many communities in or near a larger metropolitan area, you can easily move from a neighborhood of small-lot, single-family development to large-lot distribution centers. This is where proper buffering and screening standards are needed. Ensuring that the code contains standards that adequately screen industrial uses to provide a pleasant visual buffer is a key consideration, especially since loading docks may be visible.

Not all buffers are the same. For more truck traffic-intense uses, larger buffers are appropriate, with additional landscaping regulated through planting units rather than the more urban form of “X number of trees/shrubs per linear foot planted on center.” For planting units, standards more typically read “X number of trees/shrubs per X square feet of buffer area.”



Chris Jennette, AICP



I-shaped cross-dock layouts are more efficient for many distribution centers.

TABLE 2. USE DEFINITIONS, PERMISSIONS, AND STANDARDS IN KNOXVILLE'S ZONING CODE

Defined Use	Permissible Districts	Use Standards
<i>Industrial—Craft.</i> Artisan-related crafts and industrial processes that are more intensive uses, such as small-scale metalworking, glassblowing, furniture making, and small-scale food production that includes preparation, processing, canning, or packaging of food products. Microbreweries, microdistilleries, and microwineries are regulated separately from craft industrial.	General Commercial; Highway Commercial; Regional Commercial; Downtown Knoxville; Industrial Mixed Use; General Industrial	Appendix B §9.3.Q
<i>Industrial Design.</i> An establishment where the design, marketing, and/or brand development of various products are researched and developed, typically integrating the fields of art, business, science, and/or engineering. An industrial design establishment may create prototypes and products but cannot mass-manufacture products on the premises.	Neighborhood Commercial; General Commercial; Highway Commercial; Regional Commercial; Downtown Knoxville; Office Park; Industrial Mixed Use; Research and Development; General Industrial	None
<i>Microbrewery.</i> A facility for the production and packaging of malt beverages of alcoholic content for wholesale distribution, where the area of the establishment devoted to the production of malt alcoholic beverages does not exceed 25,000 square feet in commercial districts or 40,000 square feet in industrial zone districts, and may include a tasting room for consumption on-premises. A tasting room allows customers to taste/consume products manufactured on-site and purchase beverages manufactured on-site and related items. Brewery facilities that exceed this capacity are considered light industrial uses.	General Commercial; Highway Commercial; Regional Commercial; Downtown Knoxville; Industrial Mixed Use; General Industrial	Appendix B §9.3.U
<i>Microdistillery.</i> A facility for the production and packaging of alcoholic spirits, where the area of the establishment devoted to the production of spirits does not exceed 25,000 square feet in commercial districts or 40,000 square feet in industrial zone districts, and may include a tasting room for consumption on premises. A tasting room allows customers to taste/consume products manufactured on-site and purchase beverages manufactured on-site and related items. Distillery facilities that exceed this capacity are considered light industrial uses.	General Commercial; Highway Commercial; Regional Commercial; Downtown Knoxville; Industrial Mixed Use; General Industrial	Appendix B §9.3.U
<i>Microwinery.</i> A facility for the production and packaging of any alcoholic beverages obtained by the fermentation of the natural contents of fruits or vegetables containing sugar, including such beverages when fortified by the addition of alcohol or spirits, where the area of the establishment devoted to such production does not exceed 25,000 square feet in commercial districts or 40,000 square feet in industrial zone districts, and may include a tasting room for consumption on-premises. A tasting room allows customers to taste/consume products manufactured on-site and purchase beverages manufactured and related items on-site. Wineries that exceed this capacity are considered light industrial uses.	General Commercial; Highway Commercial; Regional Commercial; Downtown Knoxville; Industrial Mixed Use; General Industrial	Appendix B §9.3.U
<i>Research and Development.</i> A facility where research and development are conducted in industries that include, but are not limited to, biotechnology, pharmaceuticals, medical instrumentation or supplies, communication, and information technology, electronics and instrumentation, and computer hardware and software. A research and development establishment may create prototypes of products but may not manufacture products for direct sale and distribution from the premises.	Office Park; Industrial Mixed Use; Research and Development; General Industrial; Heavy Industrial	None

KNOXVILLE: A CASE STUDY

A recent update to Knoxville, Tennessee's Zoning Code implemented urban industrial zoning trends. The online crafter marketplace Etsy designated Knoxville a "Maker City" in 2016. To further facilitate the city's innovative reputation, the code update defined new industrial uses and established districts to encourage a mix of urban industrial, residential, and commercial uses.

The Downtown Knoxville Warehouse Subdistrict was included as part of the Downtown Subdistrict structure (Appendix B §5.5). A historic district listed on the National Register of Historic Places in the 1970s, the area is located primarily along Jackson Avenue and the rail yard on the north end of downtown and is characterized by a number of historically significant structures desirable for reuse. Both low-rise and mid-rise masonry warehouse buildings are found in the Warehouse Subdistrict, many with a ground-floor storefront design as well as areas of one- to two-story traditional commercial buildings historically occupied by businesses to support warehouse workers.

The Warehouse Subdistrict allows urban industrial uses as well as retail and residential, and district standards maintain the traditional built environment through ground-floor design standards and a requirement that structures continue to be built close to the street. Consequently, a new generation of uses can contribute to the character of the district.

To preserve the original pedestrian-oriented commercial environment, the Warehouse Subdistrict only permits structures that are 50 years or older when the code went into effect to have dwellings on the ground floor.

Knoxville also created an industrial mixed-use district for areas of more contemporary industrial development that are transitioning away from strict industrial use (Appendix B §6.1). This district allows for a full mix of uses from urban industrial, such as the maker uses highlighted earlier, to general industrial, higher density residential, and a wide range of entertainment, amusement, and retail establishments. Like the warehouse district, it also promotes the reuse of older structures



Knoxville-Knox County Planning



Examples of traditional warehouse buildings within Knoxville's Warehouse District that are primed for reuse.



Knoxville-Knox County Planning



Traditional warehouse buildings within Knoxville's Warehouse District that have been redeveloped for a mix of uses.

that may no longer be suitable for their original industrial purposes.

AN OPPORTUNITY

It's evident that industrial uses are evolving. Traditional light, medium, and heavy industrial districts may no longer address the full range of development needs of cities. Just as commercial districts have no longer limited themselves to purely commercial uses and now embrace more mixed-use environments, industrial districts have shown a need for mixed use. This can include a district with a broader mix of employment uses to districts that focus on adaptive reuse.

Similarly, urban industrial uses cannot be classified as one type of use; there is a diverse range of uses, each with different impacts as well as different benefits they can offer cities. Properly integrated into

the appropriate districts with the right standards, they can be compatible with and even enhance urban centers and boost new economies.

As cities evaluate their zoning codes, they should look at their emerging trends, their urban fabrics, and their goals for the future to determine the right mix of mixed-use industrial districts and urban industrial uses for them.

ABOUT THE AUTHOR

Arista Strungys, FAICP, is owner and head of Camiros's zoning practice. She has amassed extensive experience in a wide array of zoning and planning projects throughout her career with the firm. She has worked across the country to author innovative, workable development regulations that enhance sustainability, further economic development, and reinforce the character of their communities.

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HAS YOUR ZONING CODE KEPT
UP WITH THE EVOLUTION OF
INDUSTRIAL USES?

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