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MEMORANDUM

To: CMAP Freight Committee and Economic Development Committee

From: CMAP Staff

Date: May 16, 2016

Re: Freight land use topics

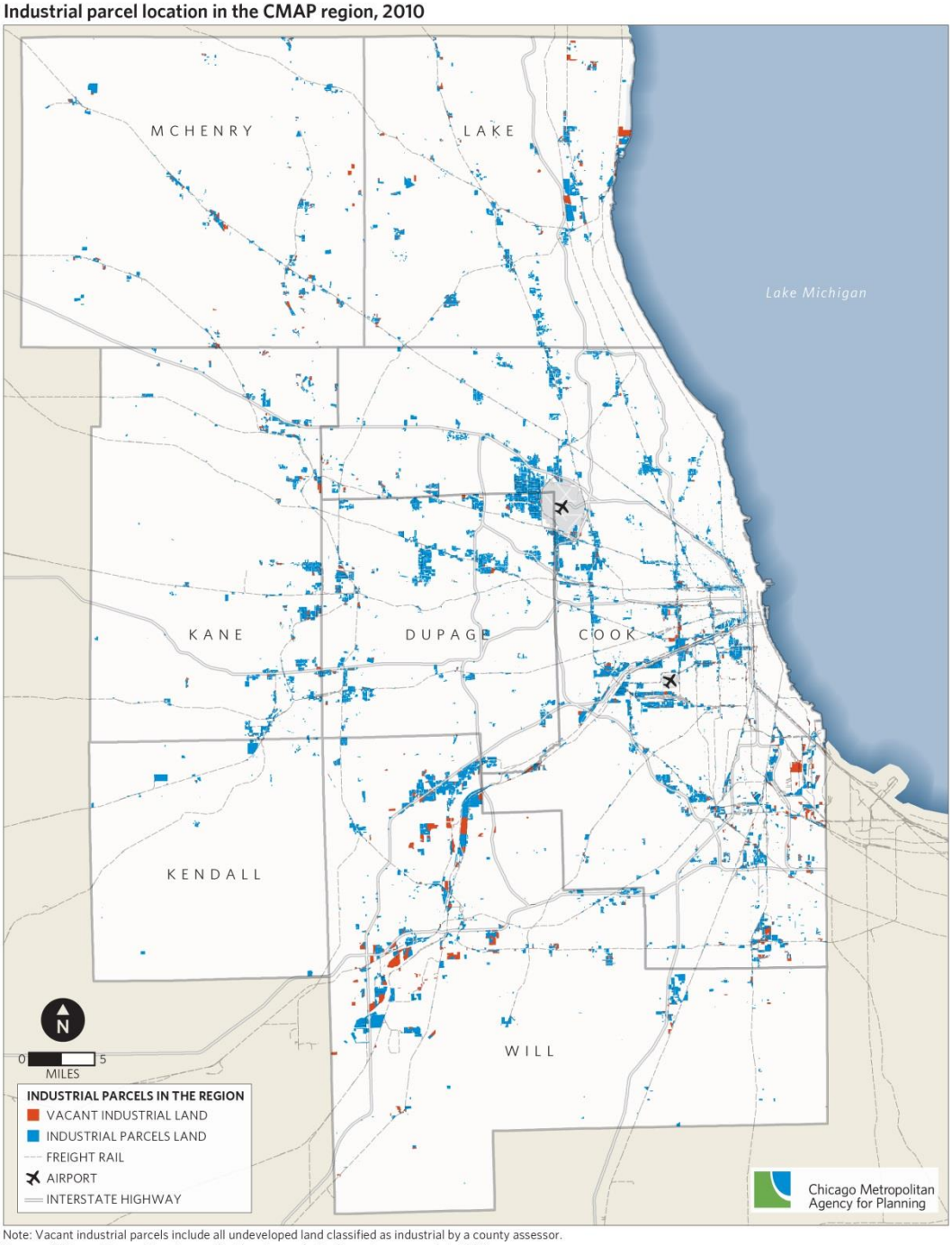
Freight is a core component of the Chicago region's economy, relying on an extensive, multimodal transportation network to ship and receive goods quickly and efficiently. The strength in goods movement also significantly shapes the region's land use patterns. Building on our freight and manufacturing strengths, the CMAP region is one of the largest industrial markets in the nation, with just under 1.1 billion square feet of industrial development. In fact, total industrial square footage exceeds the combined total of office and retail development. This memo reviews the locations of freight-supportive land uses in metropolitan Chicago, provides a high-level framework for understanding local land use conflicts related to freight, and discusses changing freight-related land use patterns at the regional scale.

Location of freight-supportive land uses

While many types of land uses, including retail and commercial areas, generate freight activity, industrial areas generate the most direct and concentrated support for freight activity in the region. Manufacturers and other industrial users rely on the freight system to receive their input materials and ship their outputs; distribution and warehousing are also directly tied to goods movement. For the purposes of this memo, "freight-supportive land use areas" are defined as concentrations of industrial land uses, particularly warehousing, distribution, manufacturing and food processing. Flex and showroom space also generate freight activity, but are not the focus of this analysis.

Parcel-level data from CMAP's 2010 Land Use Inventory demonstrates how industrial development in northeastern Illinois has occurred historically near the region's transportation assets, including rail, water, highway, and airport infrastructure.

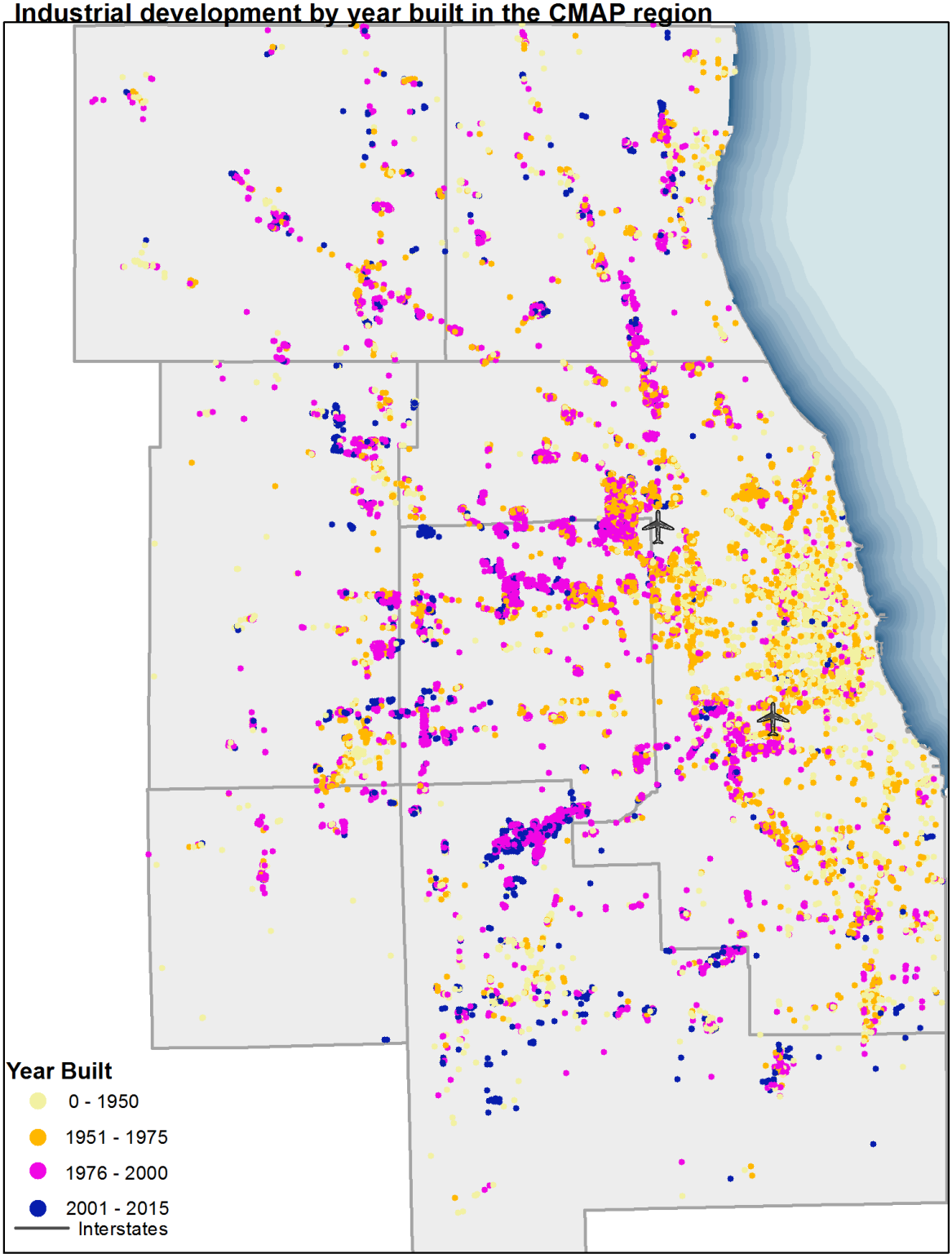
Industrial parcel location in the CMAP region, 2010



Note: Vacant industrial parcels include all undeveloped land classified as industrial by a county assessor.
Sources: Chicago Metropolitan Agency for Planning analysis of county assessor data, 2010.

Over time, however, new industrial development has moved outward from the core of the region toward the periphery. This trend has many potential reasons, including lower land costs and availability of larger sites, a desire to move away from congested areas, and/or the need to access a lower cost or specifically trained workforce. Additionally, industrial buildings built in the last 15 years are significantly larger, reflecting national industrial development trends.

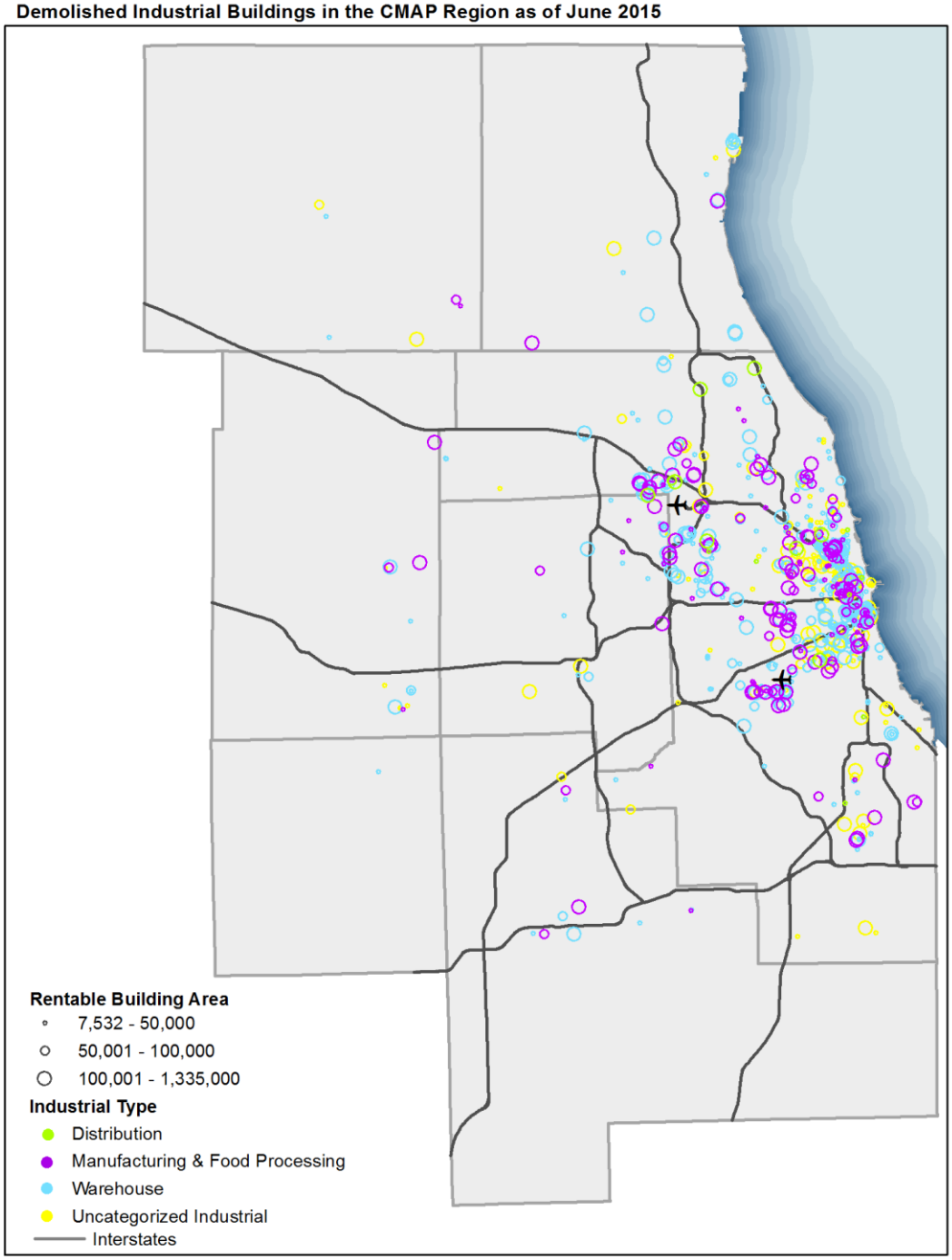
Industrial development by year built in the CMAP region



Source: Chicago Metropolitan Agency for Planning Analysis of CoStar data, 2015

The region's industrial building stock is also consistently changing, with older buildings being demolished to make way for modern industrial formats or other uses. Most demolitions of industrial buildings have occurred in the City of Chicago, home to the oldest industrial stock in the region and ready access to a variety of transportation modes.

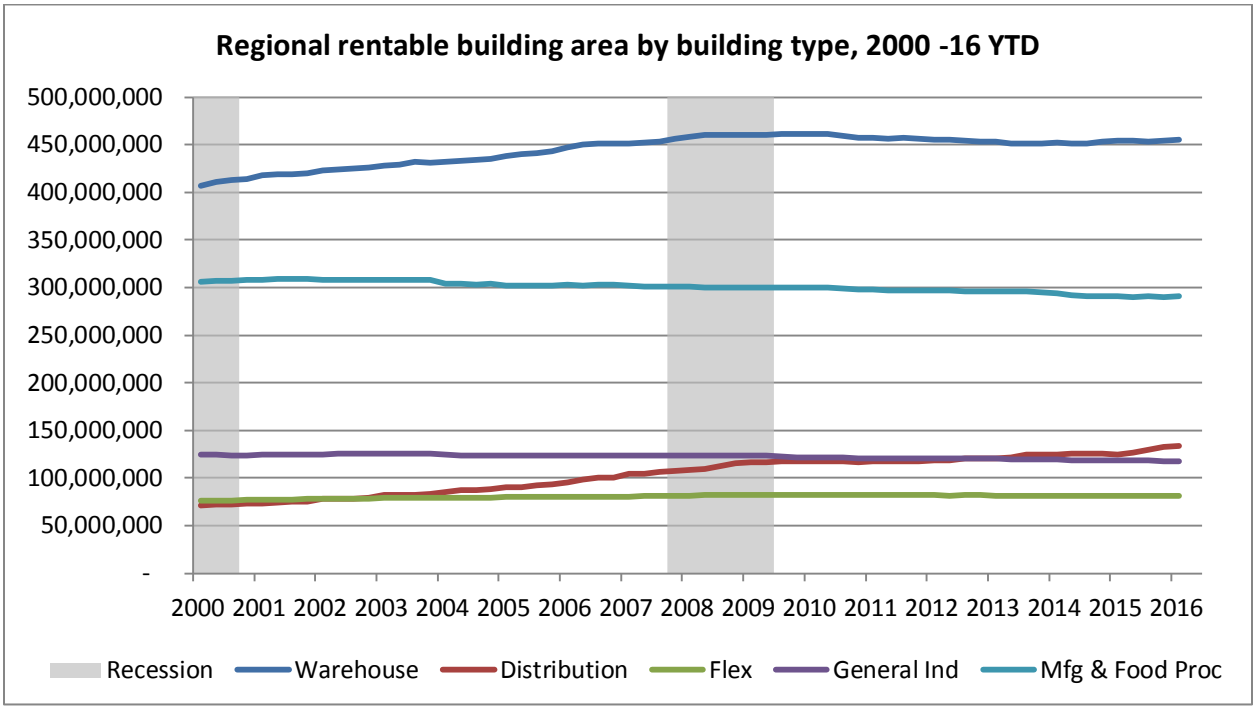
Demolished Industrial Buildings in the CMAP Region as of June 2015



Source: Chicago Metropolitan Agency for Planning Analysis of CoStar data.

Industrial land use trends

Region-wide, warehouse alone accounts for 40 percent of ther region's industrial stock, with distribution, manufacturing and food processing, general industrial, and flex space accounting for the remainder.[1] However, distribution is the fastest growing type.



The mix of industrial types varies from county to county. While most counties have a mix in industrial development types and a distribution that roughly mirrors regional proportions, Will County is an exception. Region-wide, warehouse and distribution spaces account for about 55 percent of total industrial square footage in 2016. But, in Will County, warehouse and distribution account for 80 percent of the industrial square footage. All told, about half of the region's industrial stock, as measured by rentable building area, is located in the City of Chicago and suburban Cook County. Further, Cook County has the highest proportion of all industrial types except for distribution, where Will County accounts for the plurality of the region's distribution space.

[1] Note: Industrial building types are aggregated from CoStar building categories in keeping with standard industry definitions. CMAP created the "General Industrial" category for uncategorized buildings, which the data indicates to be older, smaller, owner-occupied buildings.

CMAP Rentable Building Area by industrial development type, in millions, 2016 YTD

	Chicago	Suburban Cook	DuPage	Kane	Kendall	Lake	McHenry	Will	Region
Warehouse	70.4	141.7	95.9	35.4	1.6	30.6	9.9	75.1	460.6
Manufacturing &Food Processing	70.2	101.5	32.5	20.8	6.9	25.6	12.6	20.5	290.5
General Industrial	30.7	36.2	17.3	12.7	0.2	11.1	4.0	5.5	117.7
Distribution	10.0	29.2	21.5	10.5	3.1	6.8	2.3	46.5	129.8
Flex	14.3	29.4	17.0	5.4	0.4	7.3	3.3	4.3	81.5
TOTAL	195.6	338.0	184.1	84.9	12.2	81.4	32.0	152.0	1,080.1

Source: Chicago Metropolitan Agency for Planning analysis of CoStar data, 2016 Year to Date

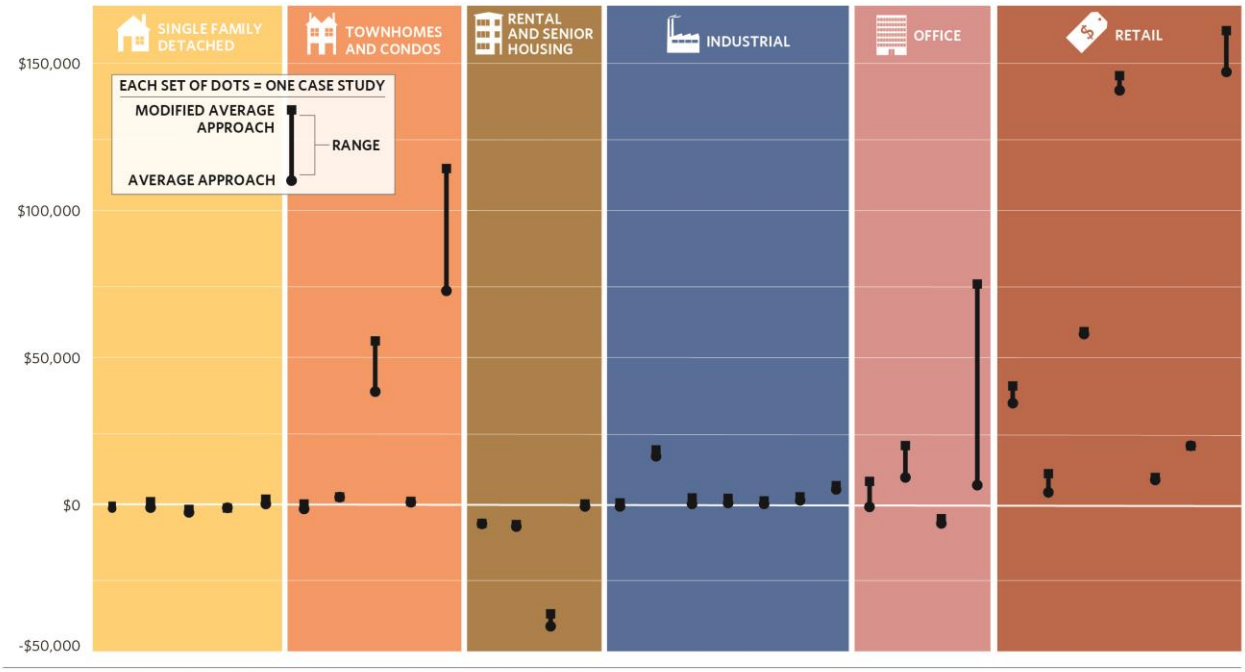
Several trends are driving change in the region's industrial development, including the location, type, and size of the developments constructed. As noted above, recent industrial development is more frequently locating in the region's outer counties. Distribution is the fastest-growing type of industrial, and is highly dependent upon a strong freight network. This type of industrial is also requiring increasingly large buildings, which leads to a demand for large sites that may be more prevalent on the edges of the region.

Municipalities and freight-supportive land uses

Preserving areas that are dedicated to freight-supportive activity ensures efficient movement of freight, promotes reinvestment in areas with existing freight infrastructure, and supports a critical economic base for the region. Industrial facilities support the region's freight and manufacturing industries, an important regional economic strength. These developments are also a core component of the network that distributes the goods essential to our everyday lives. However, local jurisdictions may choose not to zone for freight-supportive land uses for various reasons. The noise and traffic generated by warehouse, distribution, and manufacturing facilities may negatively affect nearby residents or community facilities. In addition, providing supporting transportation infrastructure can be costly. Finally, other land uses may provide stronger fiscal and/or quality of life benefits for municipalities

The cost of maintaining the freight transportation network can be a particular concern of municipalities. Industrial land uses may provide a relatively low level of tax revenues compared to the costs of providing public services such as suitable local roads. CMAP's past research on the fiscal and economic impacts of local development decisions illustrates the relatively modest fiscal return of industrial land uses to municipalities, particularly compared to other land uses like retail or office. Note that this analysis was based on a set of case studies, and results vary based on each community's unique tax structure and infrastructure responsibilities. In particular, communities where industrial development was primarily served by county or state roads received a stronger benefit from these land uses.

Municipal net fiscal impact per acre by project and land use



Bottom of range represents the average cost approach, top of range represents the modified average cost approach.
Source: Chicago Metropolitan Agency for Planning analysis of SB Friedman data

In some areas, there are strong market pressures to convert freight-supportive land uses to other purposes, such as residential or office. When combined with a stronger municipal fiscal benefit for these other uses, this can lead to fewer opportunities to support new or preserve existing industrial development.

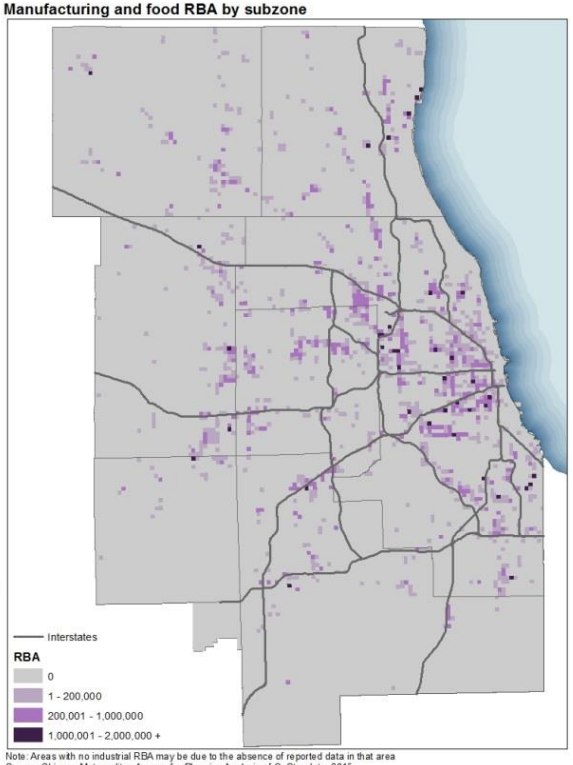
Identifying freight-supportive land use clusters

The previous sections of this memo review the general locations of freight land uses in the region, along with broad development trends for industrial spaces. In order to better plan for the region's freight system, for example by identifying transportation improvements especially valuable to freight, targeting recommendations to particular locations, or identifying locations for local freight planning, it is helpful to identify clusters of freight supportive land uses.

As a first step in this effort, staff mapped the individual subcomponents of industrial development – manufacturing and food, warehouse, and distribution – that are particularly relevant to freight. Mapping the rentable building area (RBA) by subzone[2] for each of these three types of industrial land uses demonstrates broadly similar spatial patterns for manufacturing and food spaces (which together represent one category) and warehouse spaces, which tend to mirror the overall distribution of industrial space in the region. However, distribution spaces have a somewhat different geography, withslightly weaker presence in the Cook County and a greater presence in suburban locations, particularly Will County.

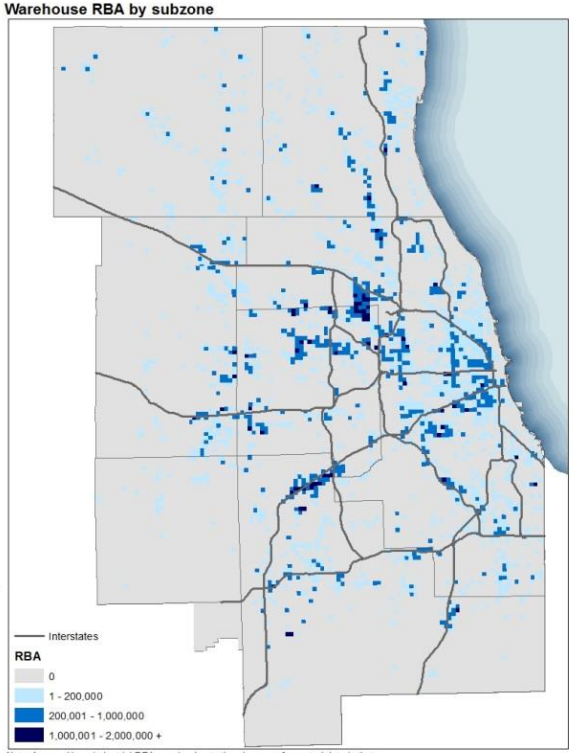
[2] Subzones are used by CMAP in travel modeling and in developing socioeconomic forecasts. Most subzones are based on the Public Land Survey System quarter-sections, which are half-mile by half-mile squares.

Manufacturing and food RBA by subzone



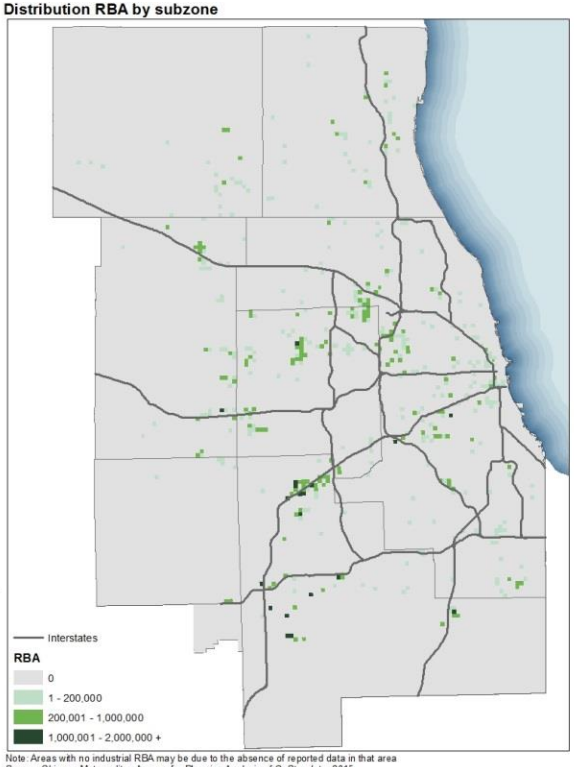
Note: Areas with no industrial RBA may be due to the absence of reported data in that area
Source: Chicago Metropolitan Agency for Planning Analysis of CoStar data, 2015

Warehouse RBA by subzone



Note: Areas with no industrial RBA may be due to the absence of reported data in that area
Source: Chicago Metropolitan Agency for Planning Analysis of CoStar data, 2015

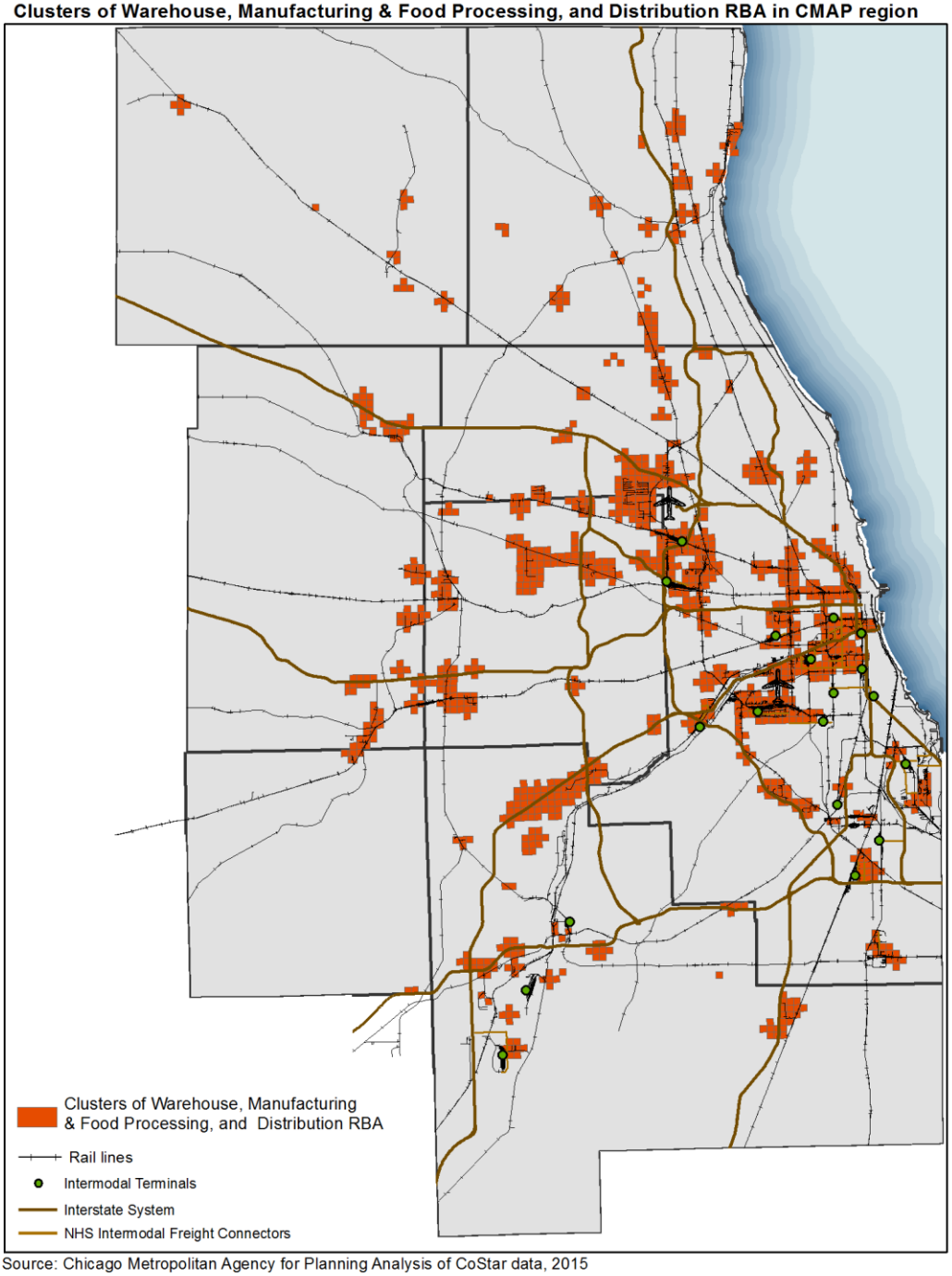
Distribution RBA by subzone



Note: Areas with no industrial RBA may be due to the absence of reported data in that area
Source: Chicago Metropolitan Agency for Planning Analysis of CoStar data, 2015

To identify concentrations of industrial land use, hot spot analysis was performed on the total RBA for industrial development by subzone. A hot spot analysis identifies statistically significant clusters of a given variable, highlighting subzones with a high concentration of RBA within the subzone and also in neighboring subzones. The map below shows that clusters of industrial development - specifically manufacturing and food processing, warehousing, and distribution facilities - are located throughout the region. Major clusters are located in the City of Chicago (primarily west and southwest of the Loop), west and south of O'Hare International Airport, on I-88 and DuPage and Kane Counties, and along I-55 in northern Will County.

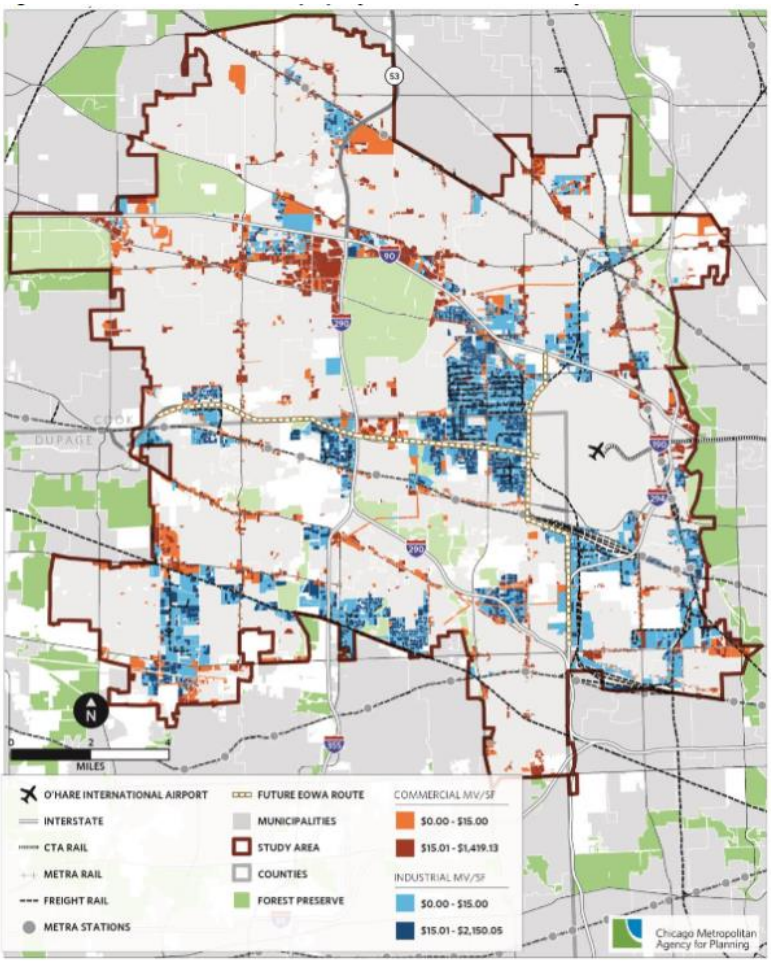
Clusters of Warehouse, Manufacturing & Food Processing, and Distribution RBA in CMAP region



Source: Chicago Metropolitan Agency for Planning Analysis of CoStar data, 2015

The region's freight transportation infrastructure and freight-supportive land use together support a thriving freight economic cluster, which represents a significant share of all economic activity in metropolitan Chicago. To continue to support these economic sectors – and to mitigate impacts on local communities through good planning and infrastructure investment – it is important to preserve freight-supportive land uses in suitable areas, such as those with ready access to major highways, airports, and/or rail lines and separated from sensitive areas. On the other hand, it may be reasonable to allow other industrial land uses in less suitable or freight-supportive locations, such as those farther from supportive transportation facilities, close to sensitive land uses, or in highly congested locations, to transition to higher and better land uses.

CMAP's past work in studying freight and manufacturing in the O'Hare subregion helps to illustrate these issues. The area near O'Hare International Airport is home to a major concentration of industrial and commercial development. While location decisions for these uses vary somewhat based on proximity to the airport and other transportation assets, industrial and office users must compete for the same space in a number of locations. According to real estate brokers in the O'Hare subregion, office developers are often willing to pay more for land than industrial developers, leading to stronger potential for office development.



Note: The study area boundary is based on ZIP codes due to the availability of economic data. Municipalities are shown for reference.

Source: CMAP, 2014, O'Hare Subregional Freight-Manufacturing Drill-Down Report, p.45.

Despite the regional importance of this major industrial area, which supports many of the region's high-wage manufacturing jobs, many local communities are interested in planning for other uses, particularly office uses that may become even more viable after the completion of the Elgin O'Hare Western Access project. This could result in a weakening of this major cluster of freight-supportive land uses. The O'Hare subregion is just one example of an area where local industrial development serves a valuable role in the regional economy. Municipalities, counties, and CMAP can play a role in identifying areas that are most valuable for industrial uses and implementing strategies to preserve and support those areas.

Local land use conflicts

Land-use conflicts can occur in areas where freight transportation facilities, including residential areas; activity centers such as main streets or downtowns, medical facilities, educational facilities, or recreational facilities; and natural or agricultural areas. At the local level, these conflicts raise numerous safety, livability, and environmental concerns such as pollution, traffic congestion, infrastructure damage, and accidents. Land-use conflicts can also reduce the efficiency of freight operations, for example by encouraging localities to impose truck-routing restrictions. The following table summarizes the potential types of local conflicts that can occur across an array of neighboring land uses.

Types of Freight-Land Use Conflicts

Land Use Type	Examples	Conflicts		
		Safety	Quality of Life	Environment
Residential areas	-High density residential areas -Residential areas with no buffer zone from industrial areas	-Accidents -Hazardous materials spills -Delayed EMS vehicles	-Noise and light pollution -Vibrations -Aesthetics/visual blight -Traffic congestion -Unreliable travel times -Disconnected neighborhoods	-Air quality -Water quality -Hazardous materials spills
Activity centers	-downtowns -medical facilities -education facilities -recreation facilities	-Accidents -Hazardous materials spills -Delayed EMS vehicles	-Aesthetics/visual blight -Traffic congestion -Unreliable travel times -Disconnected neighborhoods	-Air quality -Water quality -Hazardous materials spills
Agricultural and natural areas	-valuable agricultural land - valuable natural areas -park space or open lands	-Hazardous materials spills -Accidents with livestock or wildlife	-Stress on livestock or wildlife -Aesthetics -Change in community character -Noise and light pollution	-Air quality -Water quality -Hazardous materials spills -Habitat loss and fragmentation -Invasive species -Wildlife migration

There are many potential strategies to mitigate these conflicts. During freight plan development, staff will research best practices and confer with stakeholders to identify and refine strategies for the region.

Discussion and next steps

Land use is a critical component of the region's freight system, and the freight land uses have significant impacts on local communities and regional development patterns. Preserving areas that are dedicated to freight-supportive activity ensures efficient movement of freight, promotes reinvestment in areas with existing freight infrastructure, and supports the economic base for the region. At the same time, the region must mitigate local conflicts and address the growth of industrial land uses at the fringe of the urbanized area. At this time, staff are seeking feedback from the committee on the areas of industrial land use concentration and on the components of freight-land use conflicts.

In FY 17, staff will build on this analysis in several key ways. First, the analysis of concentrated freight activity areas will be refined, and key areas of freight/land conflict will be identified. Staff will combine freight transportation and land use analyses to identify major freight activity areas in the region. Staff will also conduct a survey of municipalities with significant concentrations of freight land uses and/or freight infrastructure to understand how they plan for these uses and facilities as well as their major concerns. Finally, staff will develop key strategies key to promote freight-supportive land use preservation, and for conflict mitigation. This analysis will focus on policies and strategies at the scale of a regional freight plan.

ACTION REQUESTED: Discussion