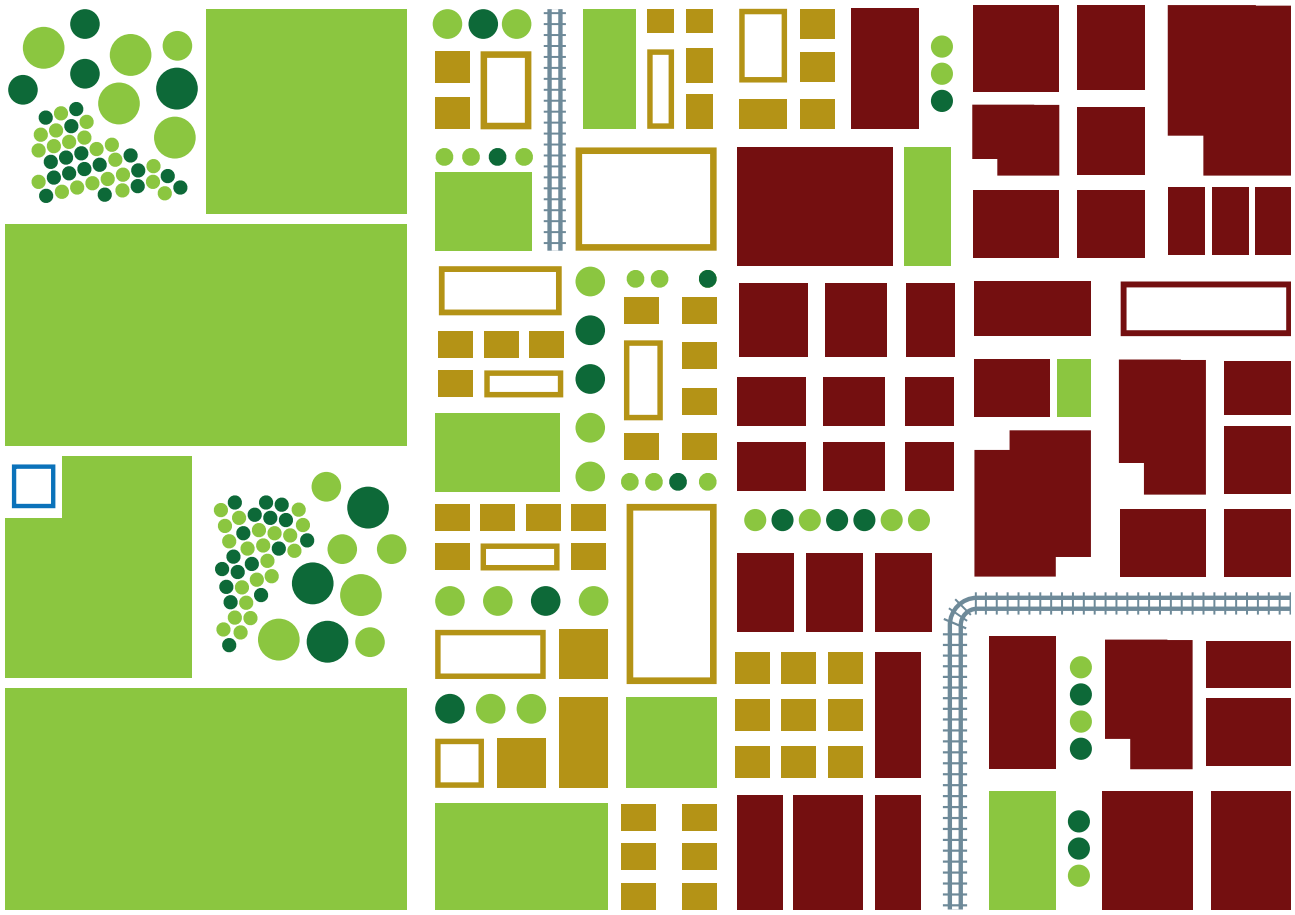
CHICAGO METROPOLITAN AGENCY FOR PLANNING | **ON TO 2050** SNAPSHOT

Infill and TOD

Exploring regional development



CMAP

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4 **About the Infill and TOD snapshot**

8 **Infill supportive areas**

Highly supportive

Partially supportive

Minimally supportive

16 **Infill supportive areas in 2000**

20 **Regional trends in infill development, 2000-15**

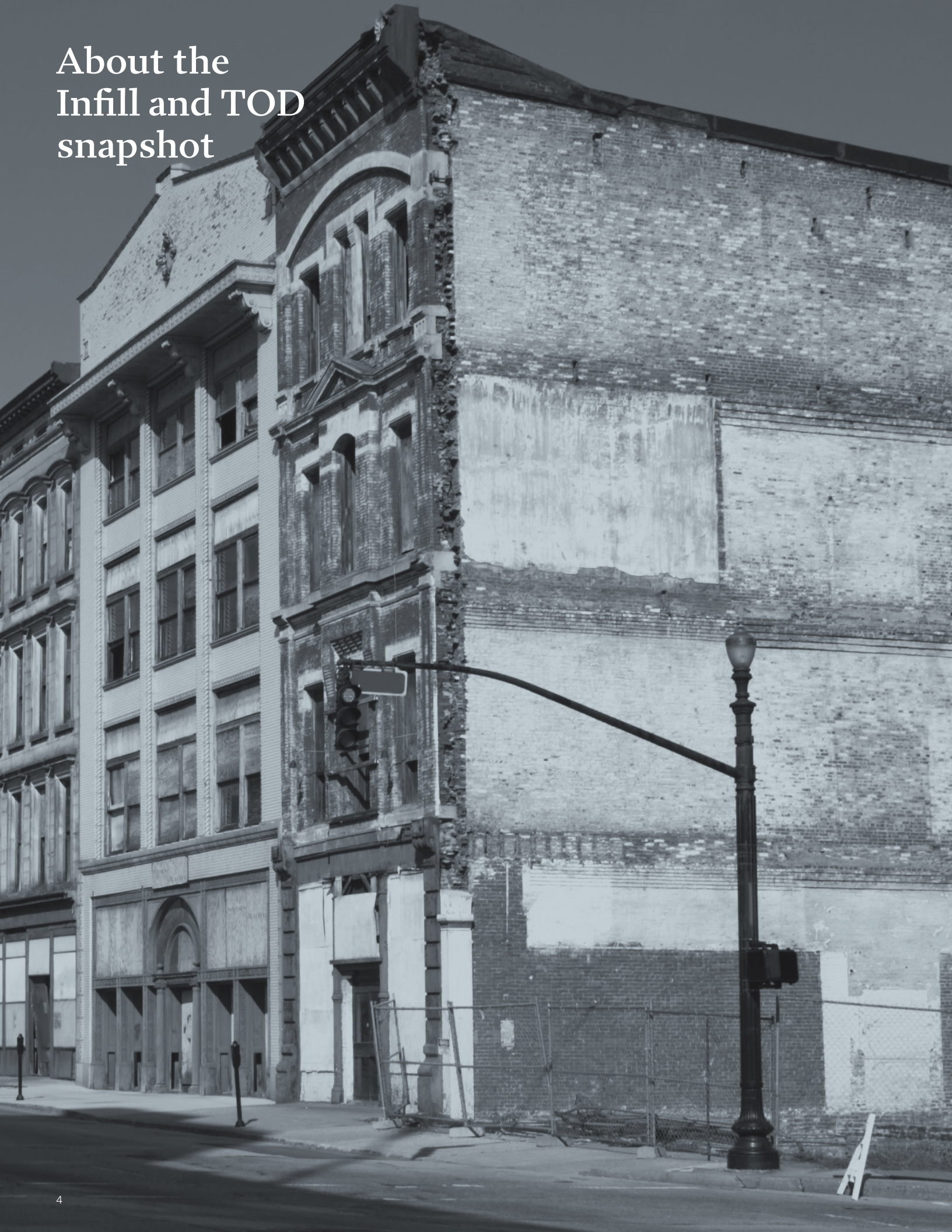
28 **Infill supportive areas in 2015**

32 **Transit-oriented development**

44 **ON TO 2050 and Infill and TOD**

CMAP

About the Infill and TOD snapshot



Investment in existing communities through infill development can support new growth, revitalize areas experiencing disinvestment, preserve natural resources, and leverage the benefits of existing transit, road, and utility infrastructure. Infill also can improve economic prospects and quality of life for local residents and communities by promoting walkability, increasing housing and transportation choices, and offering residents more access to schools, jobs, services, and basic amenities.

Yet much of metropolitan Chicago's new development since 2000 has not been reinvestment or infill. While some infill supportive or transit-rich areas have attracted new investment, residents, and employment, most have experienced small declines on these measures.

This snapshot report describes how the region's infill development and transit-oriented development, or TOD, has changed over the past 15 years. The first section defines and classifies infill supportive areas. The second section explores regional shifts in residential and non-residential development, as well as employment, between 2000-15. CMAP's analysis shows how this new growth altered which parts of the region have the greatest potential for infill development and what this means for planners. The final section focuses on infill trends in areas with high levels of transit availability, or TOD.

Building on GO TO 2040's recommendation to focus new development in places with existing development and infrastructure, particularly transit station areas, ON TO 2050 will continue to recommend that the region direct investment toward infill areas. ON TO 2050 will also recognize that not all of the region's new development can or should be infill—a topic that CMAP's Lands in Transition strategy paper explores in depth.

Focusing development in areas with existing infrastructure and amenities can create high-quality places, reduce costs, and help residents access more jobs and stay connected to their communities.

Infill supportive areas

Two factors distinguish infill from other types of development: the location and the type of land.

Infill development occurs in built-up areas with existing infrastructure, such as buildings and roads; and primarily on land that is vacant or has structures that can be repurposed.

To identify which areas of the region support infill development, this analysis uses four indicators that represent existing infrastructure and development: developed area, road density, and housing and employment density. Together, these indicators categorize each part of the region into one of three types: highly, partially, or minimally supportive of infill.

Highly infill supportive

Partially infill supportive

Minimally infill supportive

Highly infill supportive

Highly infill supportive areas have a significant amount of developed area, roads per square mile, and housing and employment density. They offer a variety of community types, uses, and densities, and many have high access to transit and amenities. Reinvestment in these areas may increase density or the variety of development types, but it may also focus on rehabilitation or replacement of obsolete or underutilized buildings. Planning in these areas should include efforts to enhance or expand transit services. Because highly infill supportive areas are largely developed, already development is generally infill.

Partially infill supportive

Partially infill supportive areas have some infrastructure, such as buildings and roads. Community character within these areas varies. Some areas are completely built-up at low to moderate densities; others have a substantial amount of natural and agricultural lands alongside moderate to high-density residential and business areas. Access to transit and employment may range from high to low. Given the diversity of characteristics in these areas, their planning needs will vary. Development may be infill, depending on the local context—including whether the development occurs primarily on already developed land rather than on natural or agricultural areas.

Minimally infill supportive

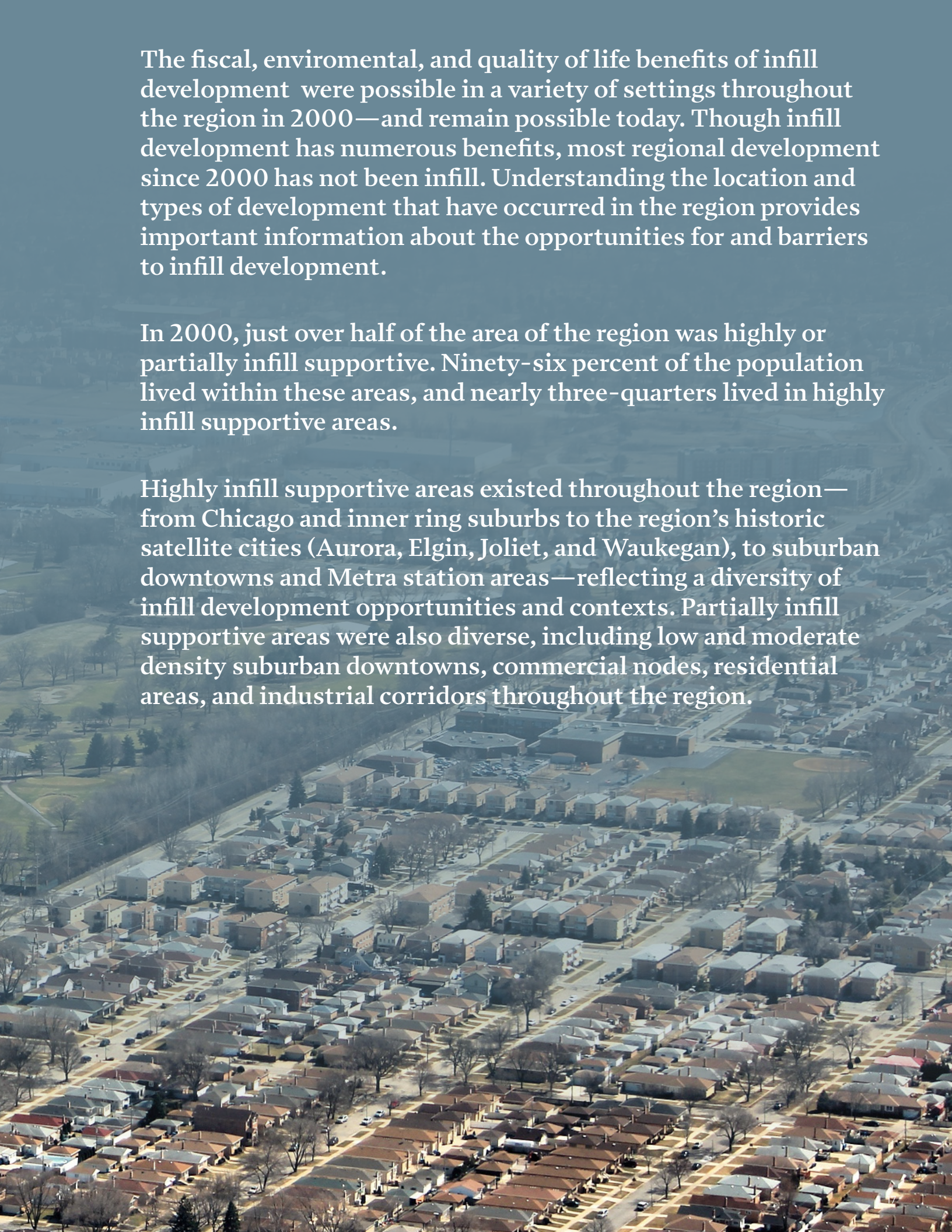
Minimally infill supportive areas are predominantly agricultural and natural lands. Communities in these areas are generally rural, though they may include small village centers or downtowns. Planning for these areas should identify critical natural and agricultural areas and ways to preserve open space while adding limited new development and infrastructure to meet community goals. Since these areas are largely undeveloped, development is unlikely to be infill.

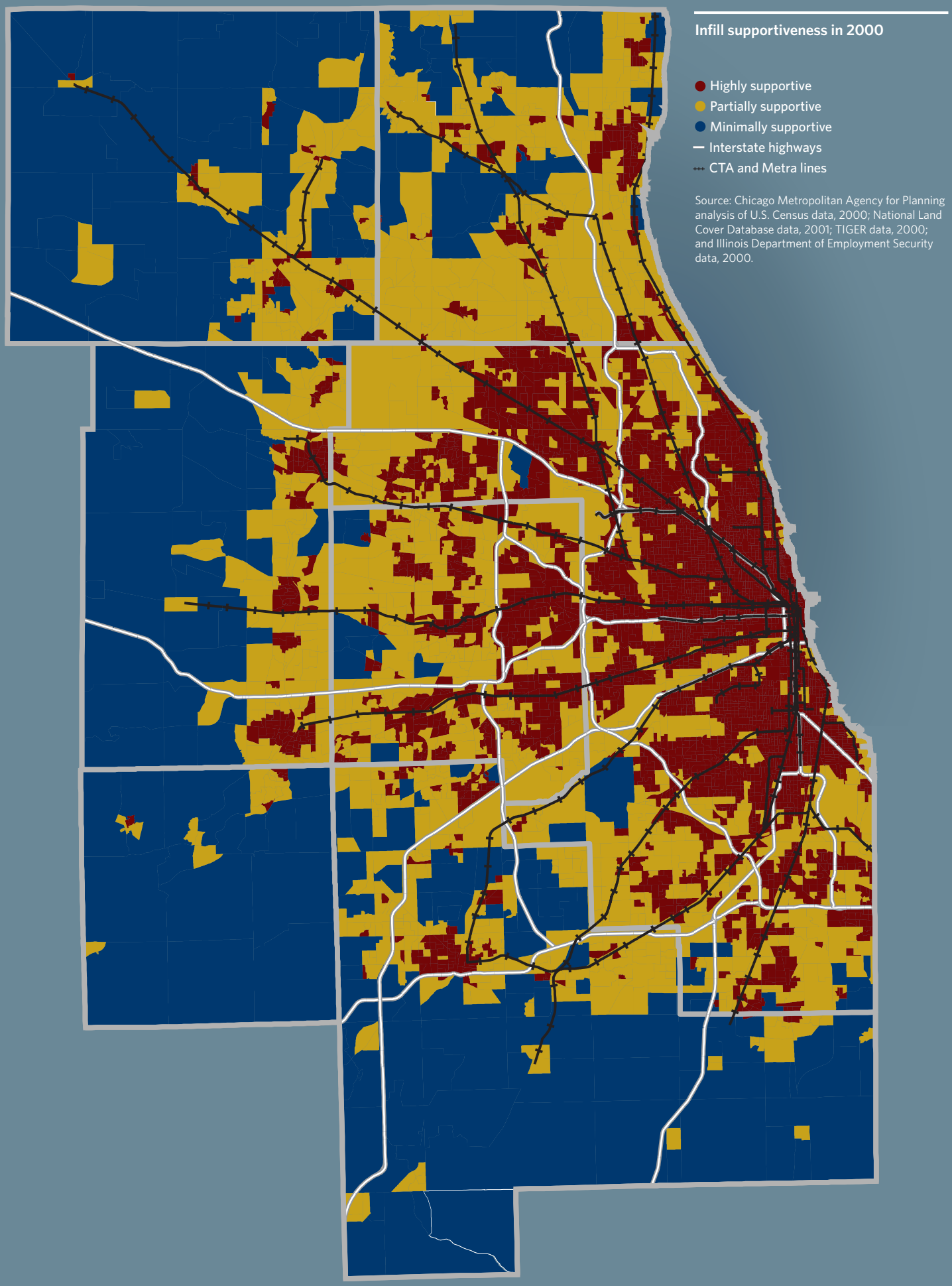
Infill supportive areas in 2000

The fiscal, enviromental, and quality of life benefits of infill development were possible in a variety of settings throughout the region in 2000—and remain possible today. Though infill development has numerous benefits, most regional development since 2000 has not been infill. Understanding the location and types of development that have occurred in the region provides important information about the opportunities for and barriers to infill development.

In 2000, just over half of the area of the region was highly or partially infill supportive. Ninety-six percent of the population lived within these areas, and nearly three-quarters lived in highly infill supportive areas.

Highly infill supportive areas existed throughout the region—from Chicago and inner ring suburbs to the region's historic satellite cities (Aurora, Elgin, Joliet, and Waukegan), to suburban downtowns and Metra station areas—reflecting a diversity of infill development opportunities and contexts. Partially infill supportive areas were also diverse, including low and moderate density suburban downtowns, commercial nodes, residential areas, and industrial corridors throughout the region.





Source: Chicago Metropolitan Agency for Planning analysis of U.S. Census data, 2000; National Land Cover Database data, 2001; TIGER data, 2000; and Illinois Department of Employment Security data, 2000.

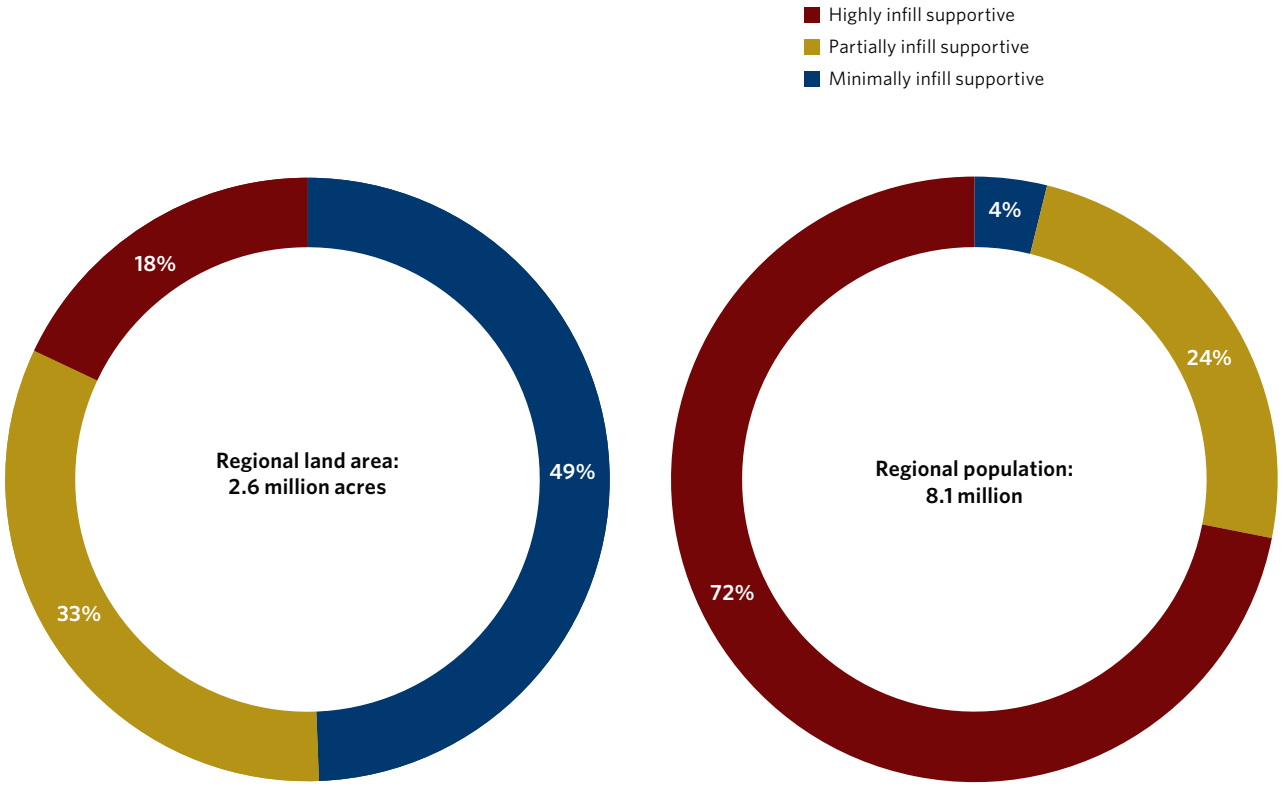
Built environment characteristics of the region, by infill supportive area type, 2000

Note: For maps showing individual built environment characteristics of the region in 2000, visit http://cmap.is/2vPN3Bb.

2000 infill supportive area type	Highly infill supportive	Partially infill supportive	Minimally infill supportive	Region
Percent developed	99%	68%	14%	47%
Average road density (road miles per square mile)	21	11	4	18
Average housing unit density (housing units per acre)	10.7	1.7	0.3	8.3
Average employment density (employment per square mile)	5,430	794	67	4,195

Land area and population characteristics of the region, by infill supportive area type, 2000

Source: Chicago Metropolitan Agency for Planning analysis of Census TIGER data, 2016, and U.S. Census data, 2000.



PERCENT OF REGIONAL LAND AREA (EXCLUDING BODIES OF WATER)

PERCENT OF REGIONAL POPULATION

Regional trends in infill development, 2000-15

Between 2000-15, the region's communities supported a significant amount of development, including both infill and non-infill. While most areas experienced some level of growth and development, it was not infill.

Significant development occurred within already developed parts of the region, but that did not result in much net population or job growth in already developed areas, particularly those that were highly infill supportive. While development patterns have shifted somewhat since the recession, these trends highlight the need for strategies to overcome barriers to infill development.

Highly infill supportive areas
This analysis considers all development within highly infill supportive areas to be infill. These areas experienced comparatively less residential development than other areas. Many already developed areas both added and lost housing units or employment, generating minimal net new housing and, in some cases, net declines. In certain areas, net declines in population and households accompanied this churn. Downtown Chicago was an exception, increasing residential units and population by nearly 400 percent from 2000 to 2010-14.

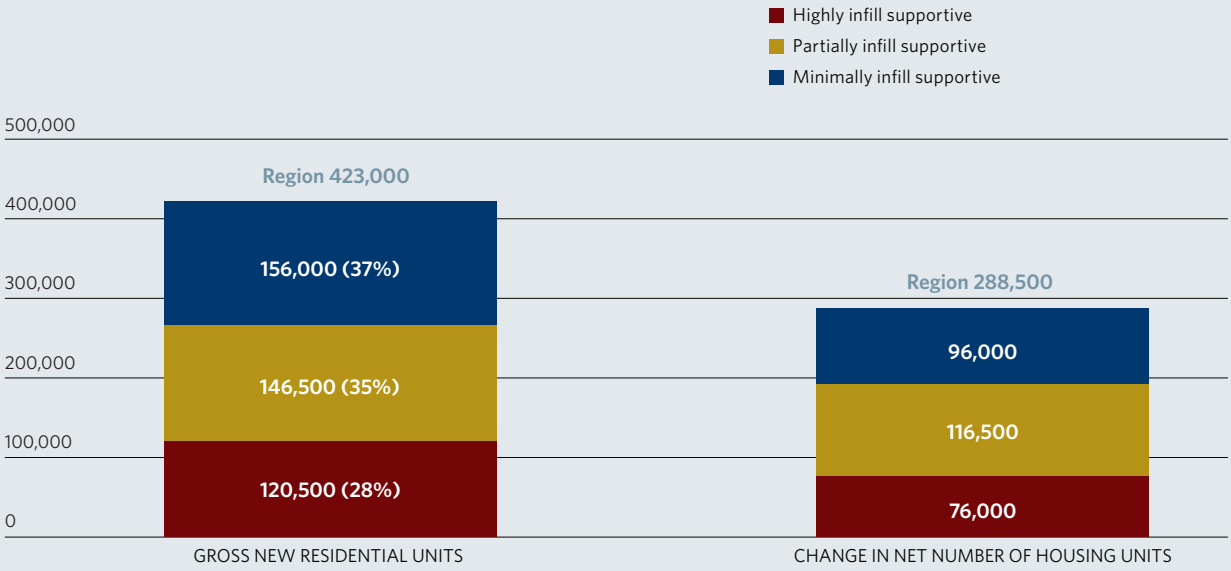
Highly infill supportive areas also experienced a net decrease in employment from 2000-15, although they benefitted most from jobs gained after the recession (2010-15). Again, downtown Chicago experienced the greatest amount of growth. Challenges persist for reinvestment in highly infill supportive areas, which often are built-out with few easily developable sites. In some areas outside of downtown Chicago, market demand has likely not been strong enough to consistently overcome the higher costs of infill development and generate the kind of growth seen in the central business district. Some infill supportive areas also face compounding challenges of poorly maintained infrastructure, low tax capacity, and weak markets.

Partially infill supportive areas
Site and local context determine whether development within partially infill supportive areas is infill, including whether the development takes place primarily on vacant or already developed land with existing infrastructure. From 2000-15, partially supportive areas gained significant non-residential development, experienced the greatest increase in employment, and had a relatively high share of net new housing units developed compared to other parts of the region. However, a significant portion of development in these areas took place on formerly undeveloped land. Approximately 18 percent of agricultural and natural lands in this infill area type were developed between 2001-11, or some 46,000 acres. This type of development may generate new infrastructure and service needs, and it often cannot be considered infill.

Minimally infill supportive areas
Among the three area types, minimally supportive areas saw the highest population growth, both in terms of growth rate (85 percent increase) and net growth (approximately 267,000 people). These areas also experienced household growth rates similar to partially infill supportive areas and had the highest share of residential units developed, generally occupied by larger family households. Minimally infill supportive areas increased jobs, even though their share of non-residential development was the lowest among the area types. In most cases, growth in these areas was not infill supportive, instead occurring on previously undeveloped land and often requiring new transportation, water, and similar infrastructure and services.

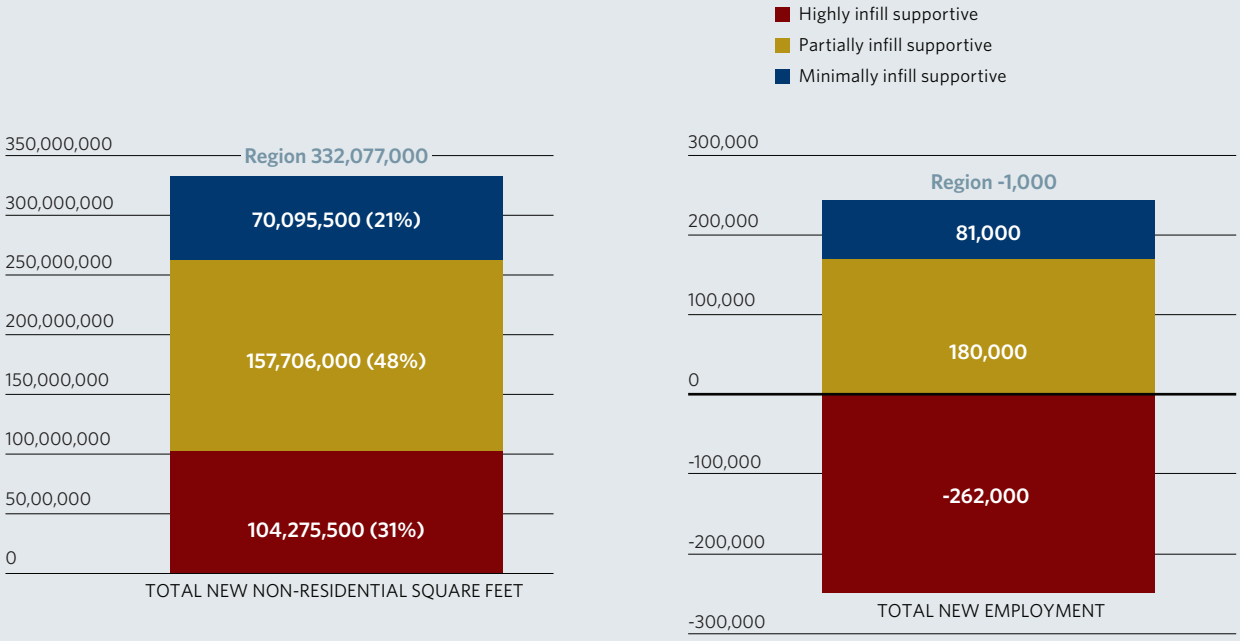
Summary of residential trends, by infill supportive area type, 2000–15

Source: Chicago Metropolitan Agency for Planning analysis of the Northeastern Illinois Development Database, 2000 and 2015, and American Community Survey estimates, 2000 and 2010-14.



Summary of non-residential trends, by infill supportive area type, 2000-15

Source: Chicago Metropolitan Agency for Planning analysis of the Northeastern Illinois Development Database, 2000 and 2015, and Illinois Department of Employment Security data, 2000 and 2015.



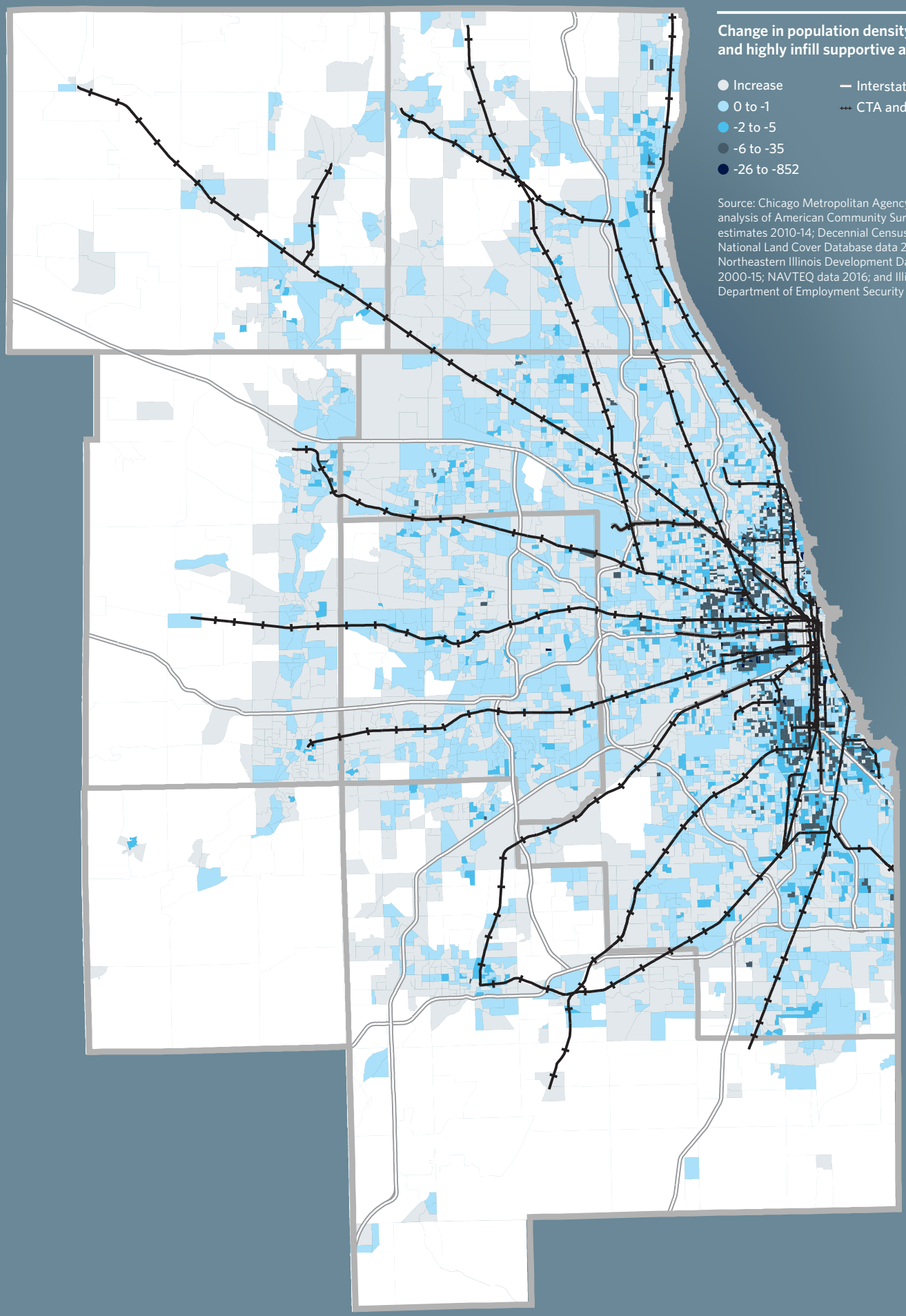
Diverging population and household totals

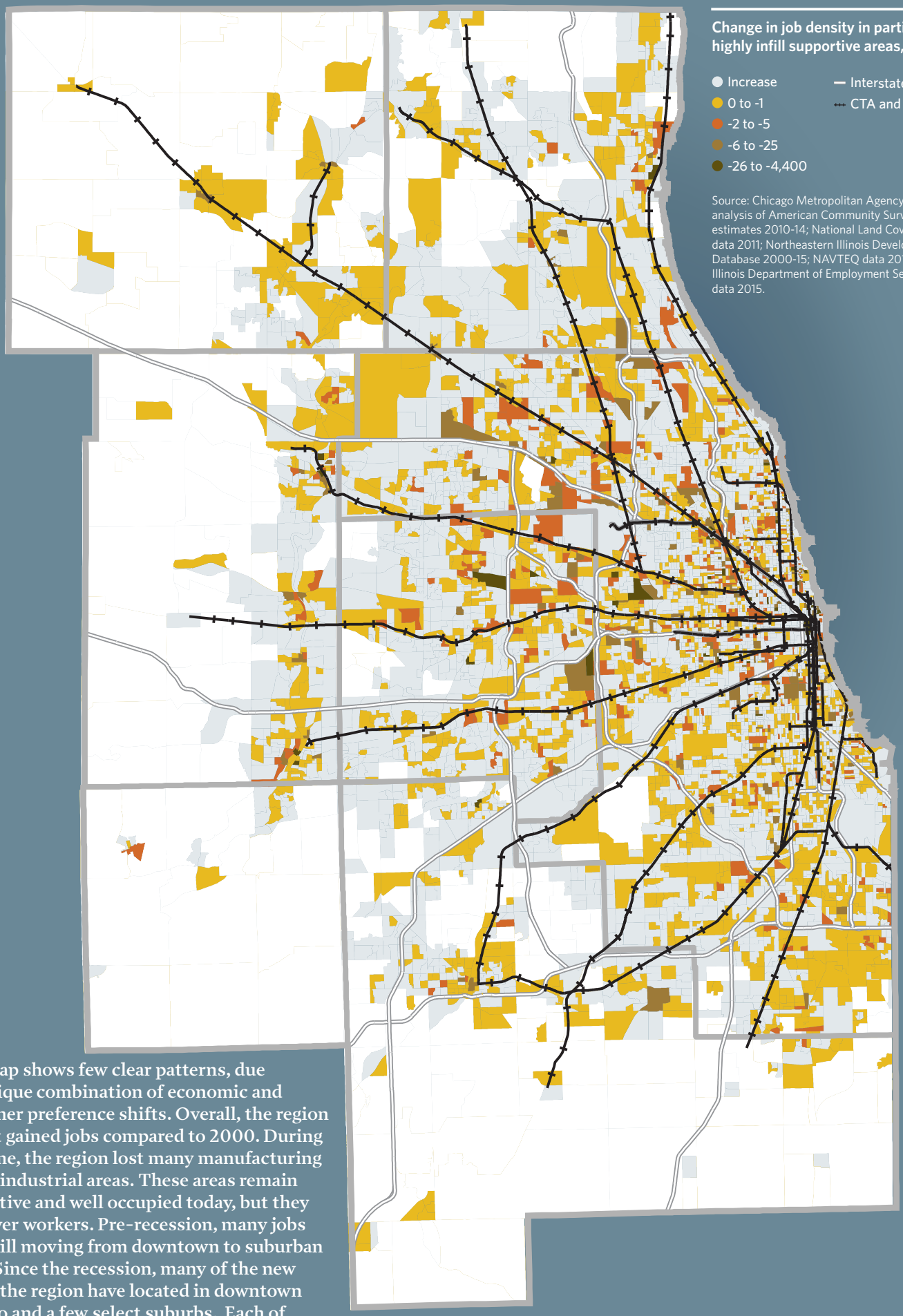
In many established parts of the region, housing units increased or stayed the same, while population declined. Residents of highly supportive areas—singles, childless married couples, small families, and empty nesters—are often likely to have smaller households. These types of residents may generate demand for more housing units or replace larger households as neighborhoods change. Minimally infill supportive areas have the largest households, while partially supportive areas have a household size somewhat between minimally and highly supportive areas. These shifts have important implications for planning. For example, areas with many family households have different needs than areas with empty nesters or young singles.

Decline within highly and partially infill supportive areas

A large share of highly and partially infill supportive areas experienced declines in people and jobs from 2000-14. Population decline can be attributed to a number of factors: The population is increasingly getting older, and many households are choosing to age in place, by remaining in their communities throughout different stages in life. If housing stock in these aging-in-place communities does not increase, newly formed family households must look elsewhere. The declines in the overall number of families (particularly with children)—and the conversion of denser housing to single-family or smaller multi-family development—have also led to small decreases in population and housing density throughout the region. Job decline was more persistent throughout the region, reflecting major shifts in manufacturing, slow recovery from the recession, societal shifts in preferred employment locations, and changing technology across sectors.

Other areas face one or a number of more severe, ongoing impediments: aging, constrained, or poorly maintained infrastructure; long-term population or employment decline; low tax bases with high tax rates; lack of private sector investment; and\or negative public perception. In areas that have experienced disinvestment, these compounding physical, market, and community challenges create significant barriers to infill and reinvestment. Yet these areas remain highly amenable to infill development in 2015. Special attention and investments should be targeted to the residents, communities, and businesses in these areas to promote new growth and take advantage of their existing infrastructure and other assets.


Change in population density in partially and highly infill supportive areas, 2000-14
Increase
0 to -1
-2 to -5
-6 to -35
-26 to -852
Interstate highways
CTA and Metra lines
Source: Chicago Metropolitan Agency for Planning analysis of American Community Survey estimates 2010-14; Decennial Census data 2000; National Land Cover Database data 2011; Northeastern Illinois Development Database 2000-15; NAVTEQ data 2016; and Illinois Department of Employment Security data 2015.



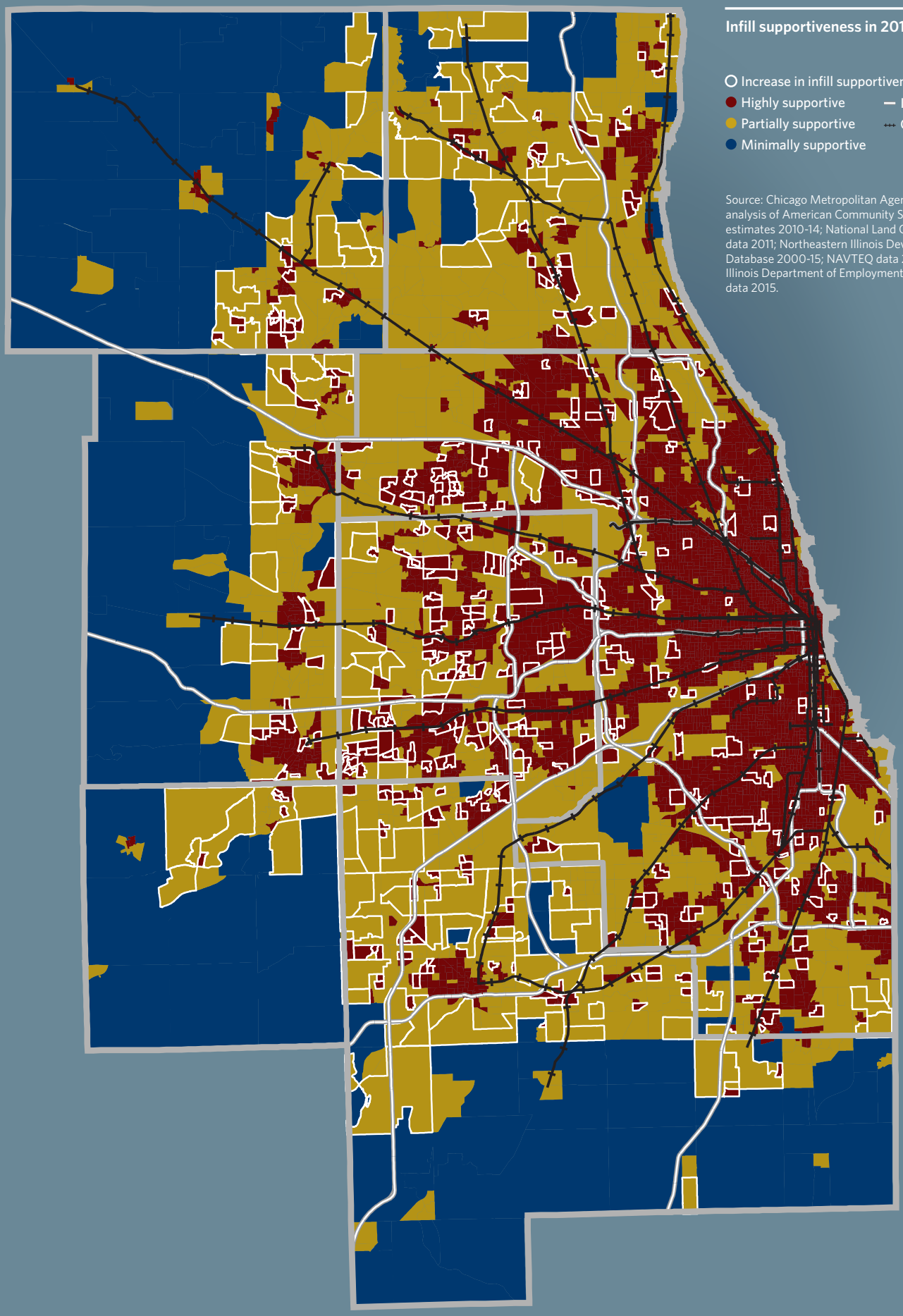
This map shows few clear patterns, due to a unique combination of economic and consumer preference shifts. Overall, the region has not gained jobs compared to 2000. During this time, the region lost many manufacturing jobs in industrial areas. These areas remain productive and well occupied today, but they use fewer workers. Pre-recession, many jobs were still moving from downtown to suburban areas. Since the recession, many of the new jobs in the region have located in downtown Chicago and a few select suburbs. Each of these distinct changes has broad implications for planning in the region.

Infill supportiveness in 2015 and key planning priorities

The development trends of the last 15 years have changed the region. Ten percent of formerly minimally infill supportive—or formerly undeveloped—areas have developed to such an extent that they can now be categorized as partially supportive. Development in these areas has added new infrastructure, expanding capacity for future development. Additionally, a smaller share of formerly partially supportive areas are now highly supportive. This transition was primarily fueled by newly developed land and increased employment, though these areas also added new roads and housing units.

Planners and decision makers must consider the economic, fiscal, environmental, and quality of life tradeoffs associated with growing and developing in minimally and partially infill supportive areas. This development may increase costs to maintain infrastructure and provide services, reduce open space and agricultural land, further strain already depleted groundwater supplies, and increase transportation expenses for residents and businesses. While infill development is not possible in all contexts, municipalities should also encourage compact and conservation-oriented development that minimizes the cost of infrastructure services, protects natural resources and environmentally sensitive areas, and supports livability and transit.

Many opportunities remain for reinvestment in highly infill supportive areas, particularly near rail and high-quality bus transit, mixed-use areas, and employment centers. Prioritizing planning and development in these areas would target scarce resources to maximize the co-benefits of infill development, such as increased density to support transit systems, reduced transportation costs, and easier access to jobs. Many areas that have experienced disinvestment are located in highly infill supportive areas. Comprehensive, innovative, and sustained efforts are required to overcome the complex suite of challenges for reinvestment in these areas. Nevertheless, reinvestment is critical to revitalize these communities.



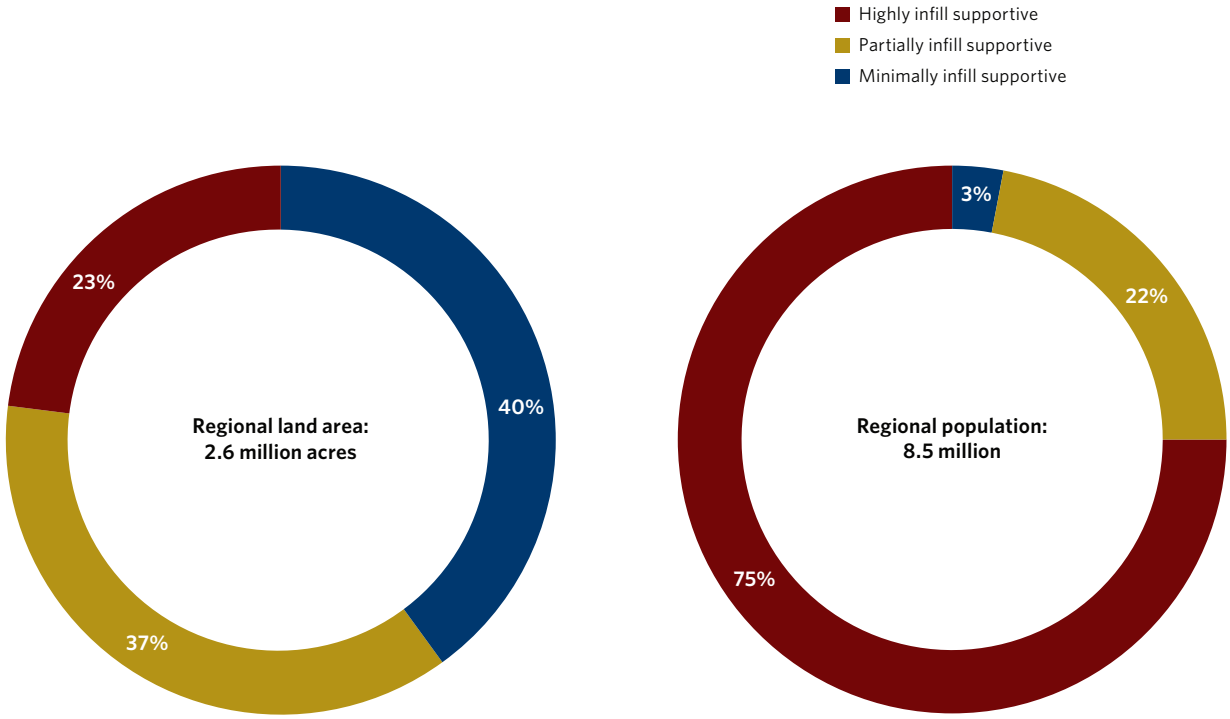
Source: Chicago Metropolitan Agency for Planning analysis of American Community Survey estimates 2010-14; National Land Cover Database data 2011; Northeastern Illinois Development Database 2000-15; NAVTEQ data 2016; and Illinois Department of Employment Security data 2015.

Built environment characteristics of the region, by infill supportive area type, 2015

2015 infill supportive area type	Highly infill supportive	Partially infill supportive	Minimally infill supportive	Region
Percent developed	99%	65%	14%	53%
Average road density (road miles per square mile)	22	10	3	20
Average housing unit density (housing units per acre)	10.0	1.5	0.3	8.4
Average employment density (employment per square mile)	4,187	778	71	3,514

Land area and population characteristics of the region, by infill supportive area type, 2015

Source: Chicago Metropolitan Agency for Planning analysis of American Community Survey estimates 2010-14, and NAVTEQ data, 2016.



PERCENT OF REGIONAL LAND AREA (EXCLUDING BODIES OF WATER)

PERCENT OF REGIONAL POPULATION

Transit-oriented development

Photo Credit: David Wilson via Flickr, https://flic.kr/p/VmPoZp

A growing number of residents want to live in places where using a car is optional, and where they have access to recreation, employment, and shopping.[1] Planning to encourage more TOD in the region can help to create more of these types of places.

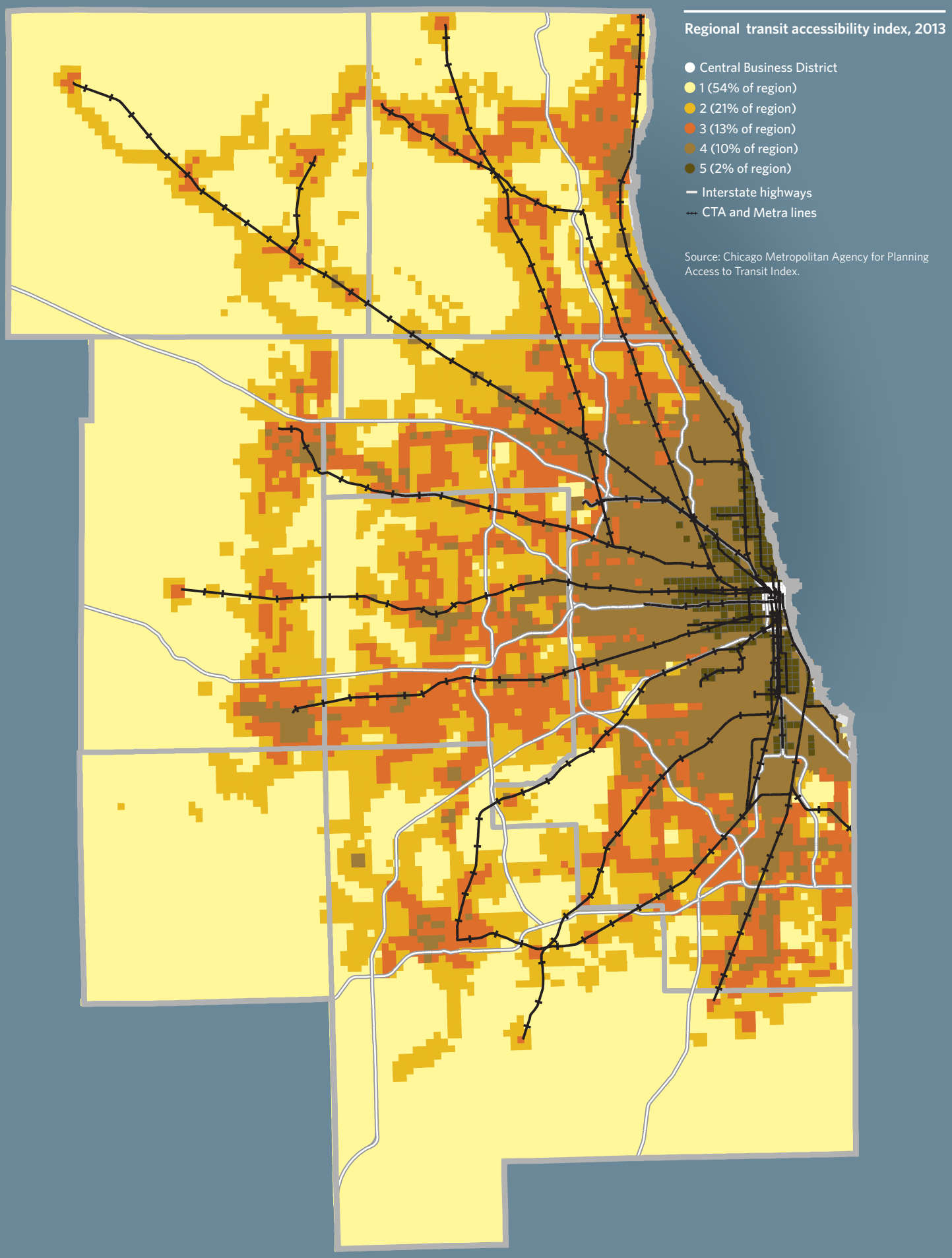
TOD is built at densities high enough to support transit systems and designed to facilitate easy pedestrian access to transit. Over the long term, this development pattern can foster strong, walkable, mixed-use community centers; increase transportation options; decrease transportation costs for residents; and provide greater access to employment. To measure TOD, this analysis tracks development within a half-mile walk from a Chicago Transit Authority or Metra rail station ("rail walksheds") and in areas with high levels of bus or rail transit availability.[2]

Areas of high transit availability typically have bus stops or train stations where transit makes frequent stops, as well as an environment amenable to walking (categories 4 and 5). Because high transit availability areas tend to be in more developed parts of the region, they are particularly well suited to infill and TOD. High transit availability areas were home to more than 50 percent of the region's jobs, housing units, and population in both 2000 and 2015.

Moderate transit availability areas (category 3) have limited transit service throughout the day and are less pedestrian friendly than higher transit areas. Planning in these areas may focus on efforts to raise demand for transit through land use strategies that increase population and employment density; increased transit demand can help to support sustainable transit systems.

Areas of limited transit availability (categories 1 and 2) represent 75 percent of the region's land. Often these areas have limited population and employment, but they do contain rail stations with park and rides or small commercial nodes.

Trends for development in transit-heavy areas follow broader regional infill patterns: significant development in some areas, but ongoing challenges related to disinvestment, including population loss and, in some cases, declining employment. Since 2000, more than 20 percent of the region's new residential and non-residential development occurred in high transit availability areas. These developments represented just two percent of newly developed acreage tracked within CMAP's Northeastern Illinois Development Database (NDD), indicating their higher density and smaller footprint. Development in Chicago's Central Business District (CBD) represented a large portion of total NDD development.


Regional transit accessibility index, 2013
Central Business District
1 (54% of region)
2 (21% of region)
3 (13% of region)
4 (10% of region)
5 (2% of region)
Interstate highways
CTA and Metra lines
Source: Chicago Metropolitan Agency for Planning
Access to Transit Index.

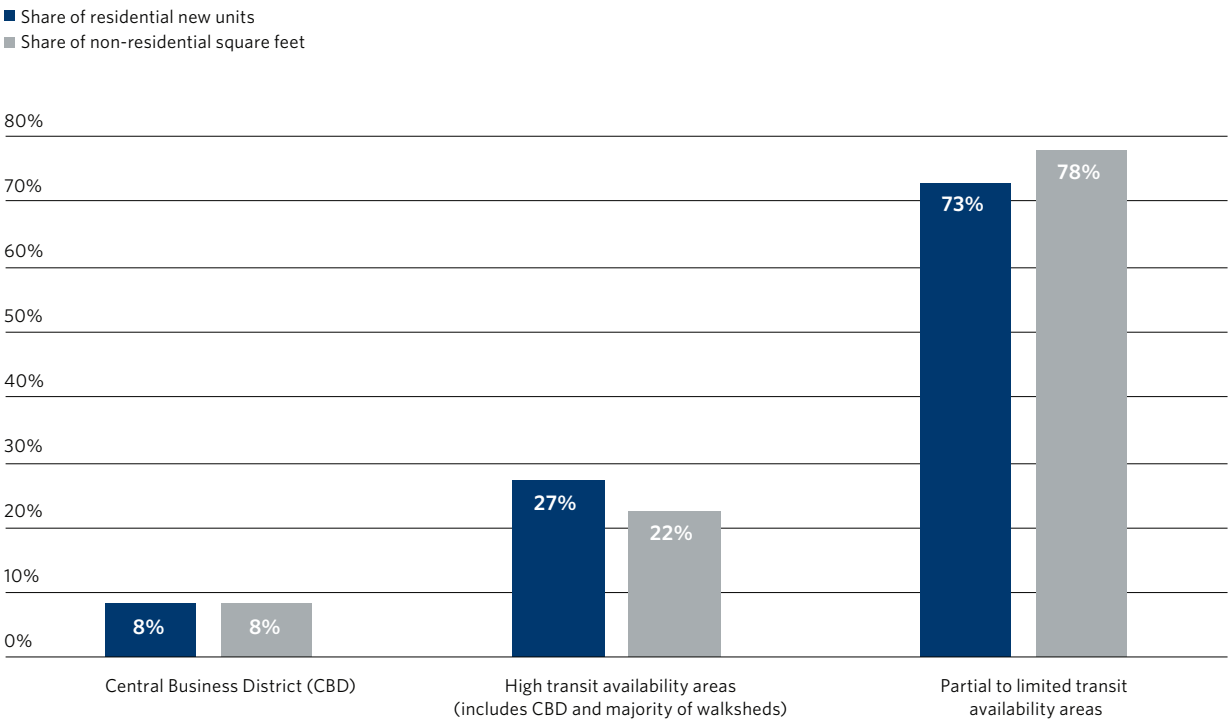
While transit-served areas experienced a net decline in jobs between 2000-15 and have not yet returned to pre-recession levels of employment, job recovery increased from 2010-15. Areas with very high transit availability benefited most from employment gains between 2010-15, while parts of the region with very limited transit availability saw a lesser share of new jobs. The greater increase in net jobs in transit-served areas, despite a lower share of non-residential development, could be due to the greater job density of industries in transit-served areas, or to a preference for transit access among currently growing industries.

The reverse occurred for housing unit change since 2000: While high transit availability areas received a quarter of the region's net new housing units, the majority of new housing was created in areas with limited transit availability. This produces mixed results for the region's transit system. Easy access to employment from a transit stop is a major driver of transit use, but lack of good access to transit from one's home may decrease transit use for daily commutes.

Furthermore, high transit availability areas experienced net population loss, even while adding housing units. This population loss may be spurred by increases in seniors, young singles, and other groups with smaller households; regional shifts in the population to the collar counties; and decreasing average household sizes, particularly in highly infill supportive areas.

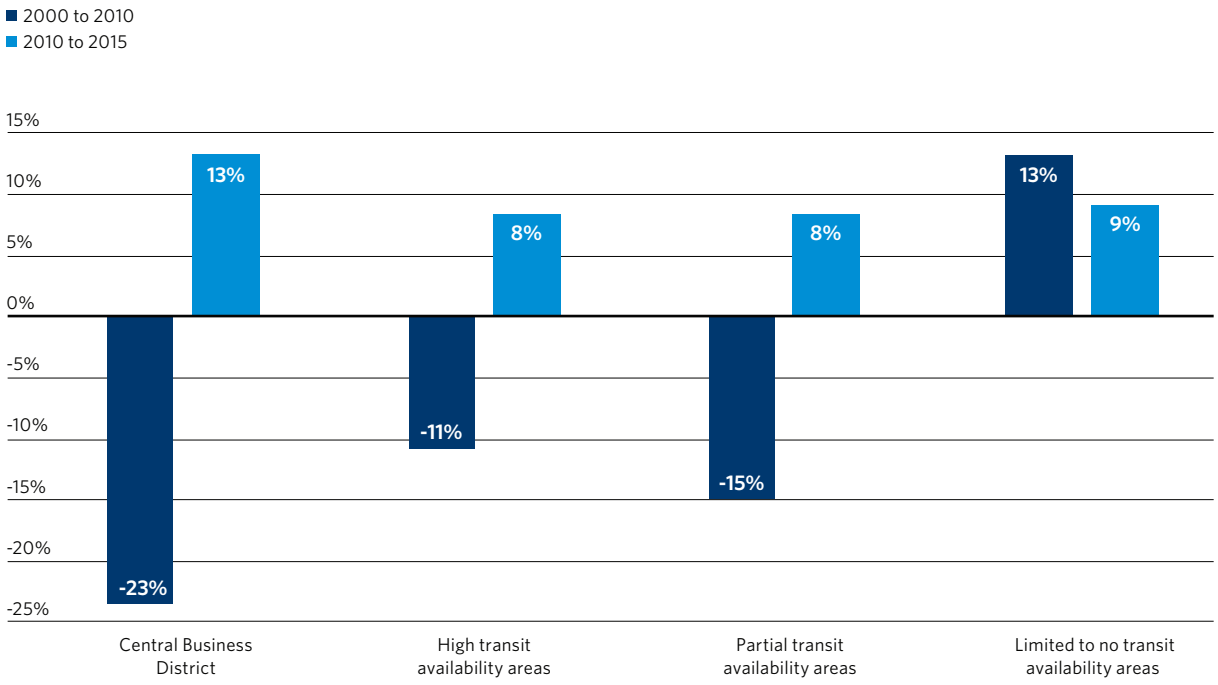
Share of new housing units and non-residential square footage, by transit availability, 2000-15

Source: Chicago Metropolitan Agency for Planning analysis of Northeastern Illinois Development Database data, 2000 and 2015.



Percentage change in number of jobs, 2000-10 and 2010-15

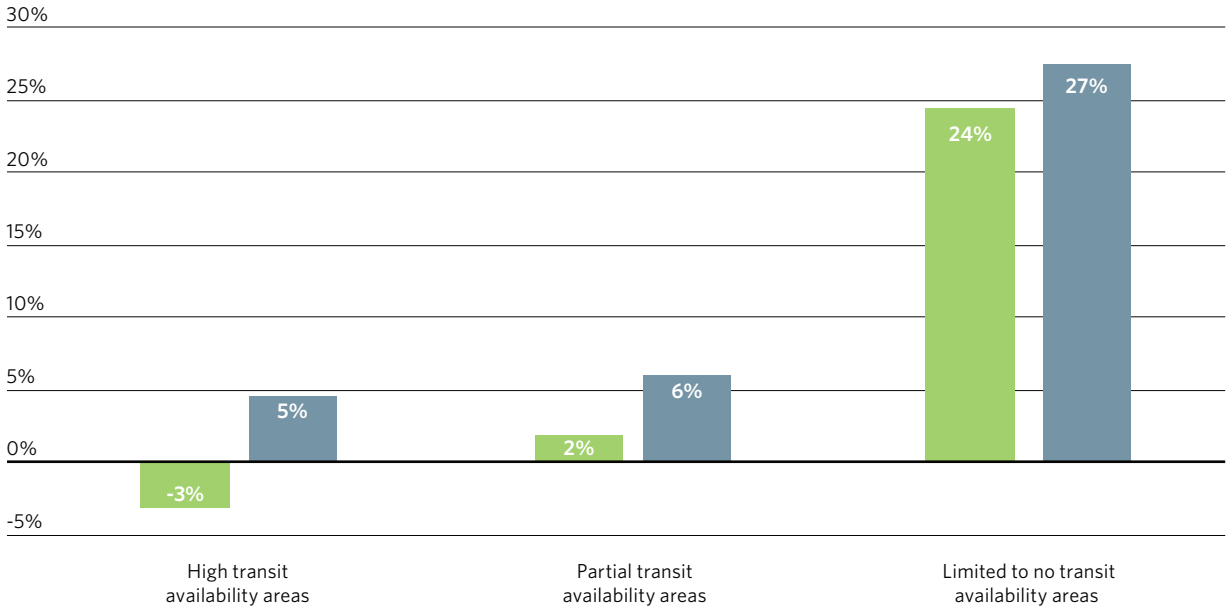
Source: Chicago Metropolitan Agency for Planning analysis of Illinois Department of Economic Security data, 2000-15.



Change in population and housing units, 2000 to 2010-14

Source: Chicago Metropolitan Agency for Planning analysis of U.S. Census data, 2000, and American Community Survey estimates, 2010-14.

Note: Population increased by 396 percent and housing units by 397 percent between 2000 and 2010-14 in the Central Business District.



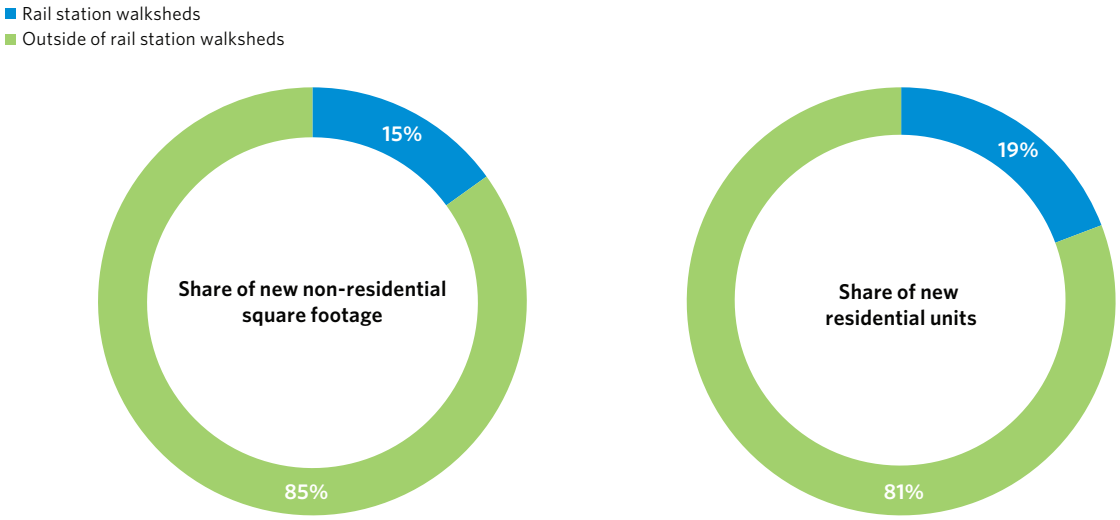
Many areas with transit-supportive housing density in 2000 lost population and employment. Population decline in transit-served areas may adversely affect transit ridership and service frequency, creating challenges for the transit system. Increases in housing units and employment density help support higher quality transit service. Basic bus service requires densities of at least seven housing units per acre to be successful. Despite overall regional increases in housing units, from 2010-14, areas with sufficient density to support basic bus service and higher use transit, such as commuter or light rail, were home to just 30 percent of the region's population, down slightly from 32 percent in 2000.

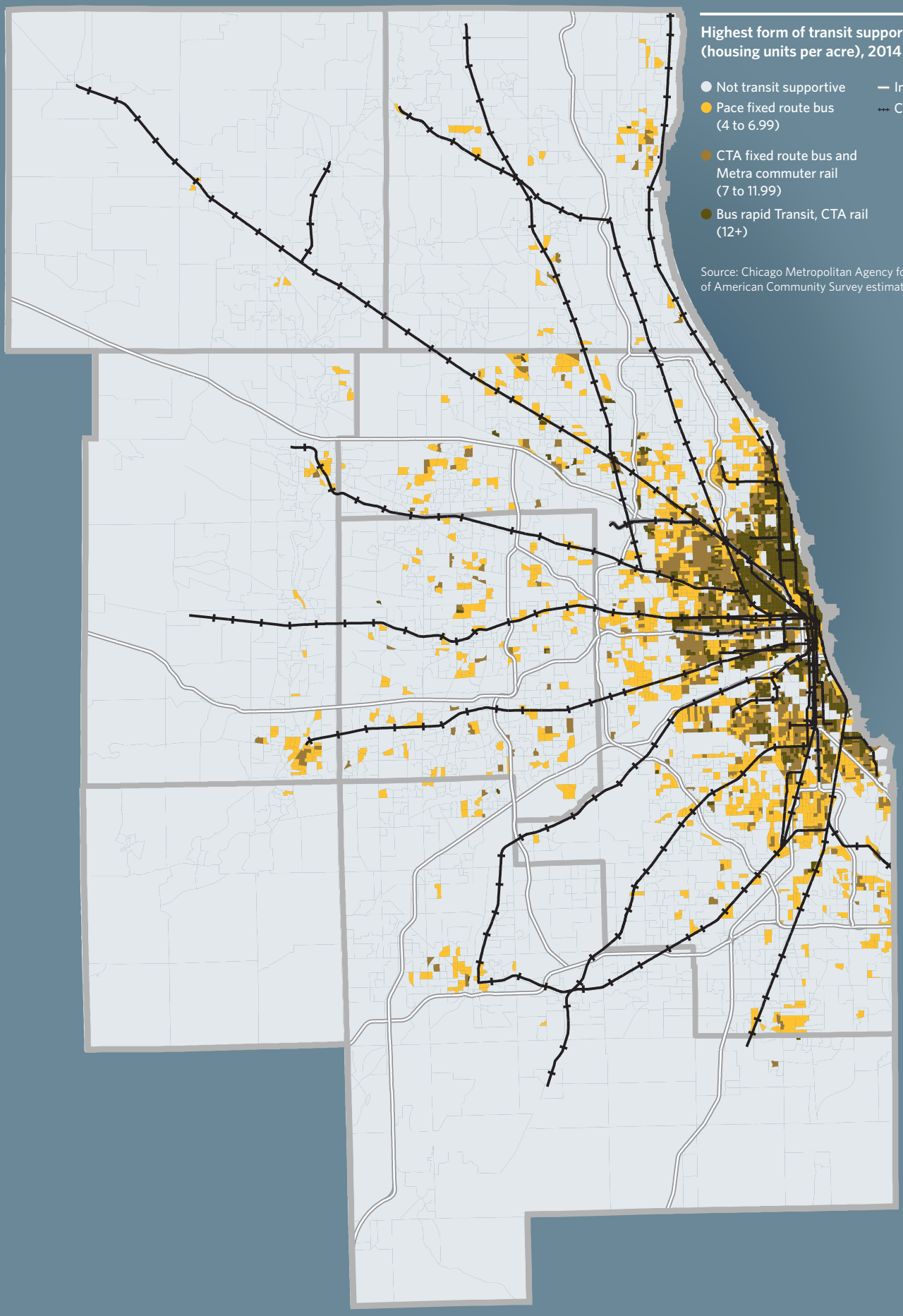
Emerging research shows that employment density is as important as household density in raising transit ridership.[3] The significant employment density of Chicago's CBD, combined with its high access to transit, helps drive ridership across all transit systems and routes. The CBD is also the only area in the region with transit-supportive levels of employment density. While employment density has increased most in the CBD since 2010, increasing high-density employment throughout the region's transit-served areas may be one of the most effective strategies to increase ridership and ultimately improve service.

Since 2000, 15 percent of the region's NDD non-residential development and 19 percent of the region's NDD residential development occurred in transit-served areas. Development within rail station walksheds, particularly the CBD, represented a large share of housing and non-residential development from 2000-15. However, system-wide, walksheds experienced a decrease in jobs and population. This decrease, even as housing units increased, is reflected in demographic changes in high transit availability areas. Factors include trends toward lower density development in walksheds, as well as increasing non-residential development in walksheds. Employment trends shifted post recession, with a resurgence of jobs in the CBD and other rail station areas, but this was insufficient to overcome pre-recession employment losses. Similar data is not yet available for population trends.

Share of new development in transit-served areas, 2000-15

Source: Chicago Metropolitan Agency for Planning analysis of Northeastern Illinois Development Database data, 2000 and 2015.



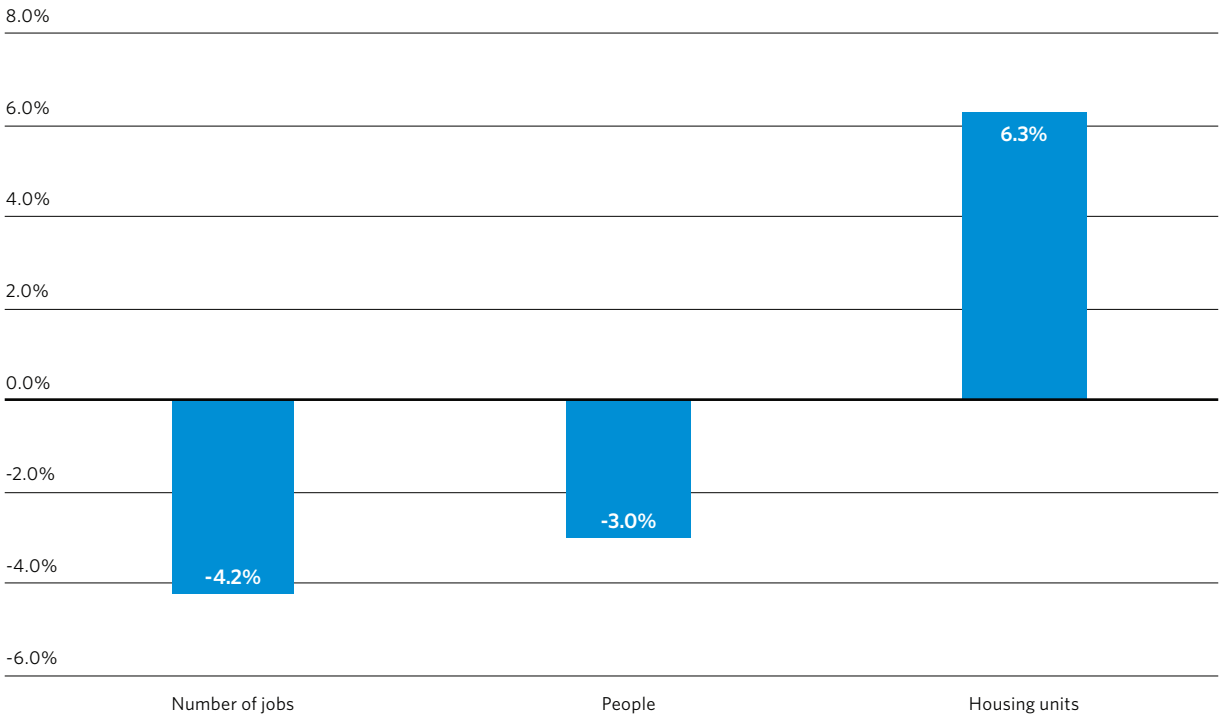

Highest form of transit supported, (housing units per acre), 2014
Not transit supportive
Pace fixed route bus (4 to 6.99)
CTA fixed route bus and Metra commuter rail (7 to 11.99)
Bus rapid Transit, CTA rail (12+)
Interstate highways
CTA and Metra lines
Source: Chicago Metropolitan Agency for Planning analysis of American Community Survey estimates 2010-14.

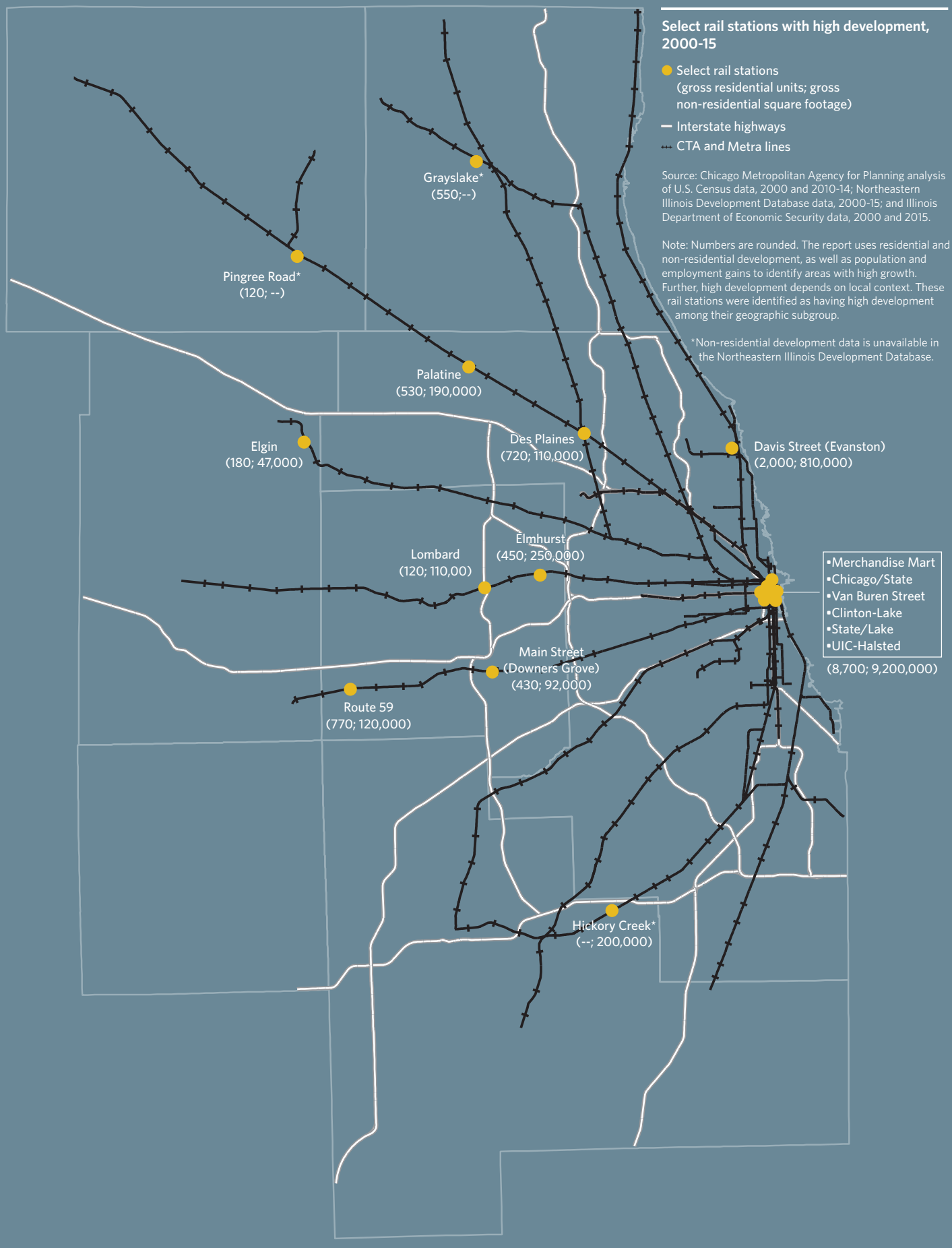
However, a number of rail station walksheds did see significant development, population, and/or employment gains. In the city of Chicago, walksheds outside the CBD, such as the West Loop and South Loop, gained population and employment. Outside of Chicago, the amount of TOD in rail station walksheds varied significantly by location. Walksheds closer to the region's core generally experienced greater growth, and many stations throughout the region lost population, employment, or development.

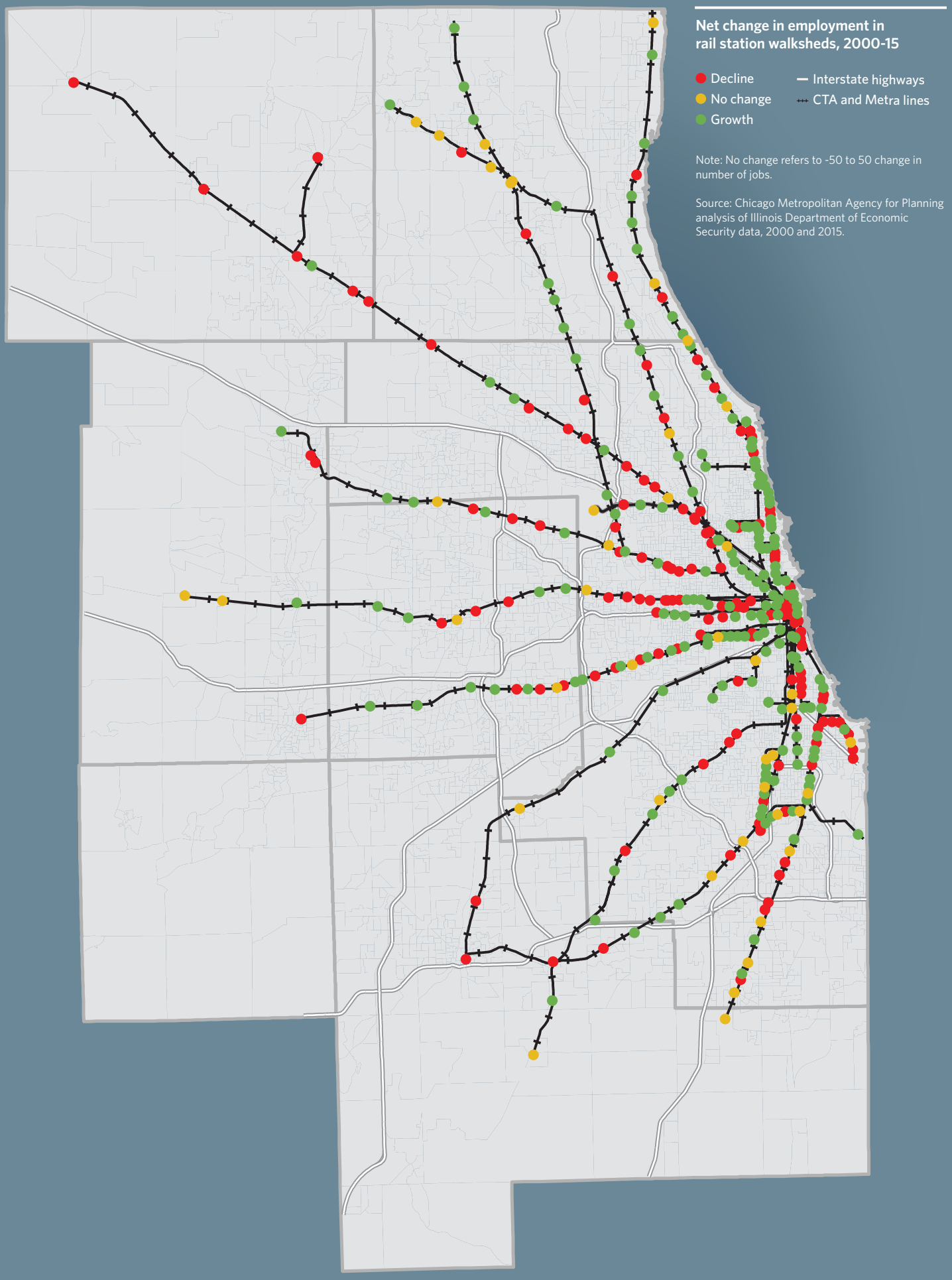
Net change in jobs, population, and housing units in rail station walksheds, 2000 to 2010-14/15

Source: Chicago Metropolitan Agency for Planning analysis of Illinois Department of Economic Security data, 2000 and 2015; U.S. Census data, 2000; and American Community Survey estimates, 2010-14.

Note: Rail station walksheds include the Central Business District.




Select rail stations with high development, 2000-15
Select rail stations (gross residential units; gross non-residential square footage)
Interstate highways
CTA and Metra lines
Source: Chicago Metropolitan Agency for Planning analysis of U.S. Census data, 2000 and 2010-14; Northeastern Illinois Development Database data, 2000-15; and Illinois Department of Economic Security data, 2000 and 2015.
Note: Numbers are rounded. The report uses residential and non-residential development, as well as population and employment gains to identify areas with high growth. Further, high development depends on local context. These rail stations were identified as having high development among their geographic subgroup.
*Non-residential development data is unavailable in the Northeastern Illinois Development Database.
Grayslake* (550;--)
Pingree Road* (120; --)
Palatine (530; 190,000)
Elgin (180; 47,000)
Des Plaines (720; 110,000)
Davis Street (Evanston) (2,000; 810,000)
Elmhurst (450; 250,000)
Lombard (120; 110,00)
•Merchandise Mart
•Chicago/State
•Van Buren Street
•Clinton-Lake
•State/Lake
•UIC-Halsted
(8,700; 9,200,000)
Main Street (Downers Grove) (430; 92,000)
Route 59 (770; 120,000)
Hickory Creek* (--; 200,000)

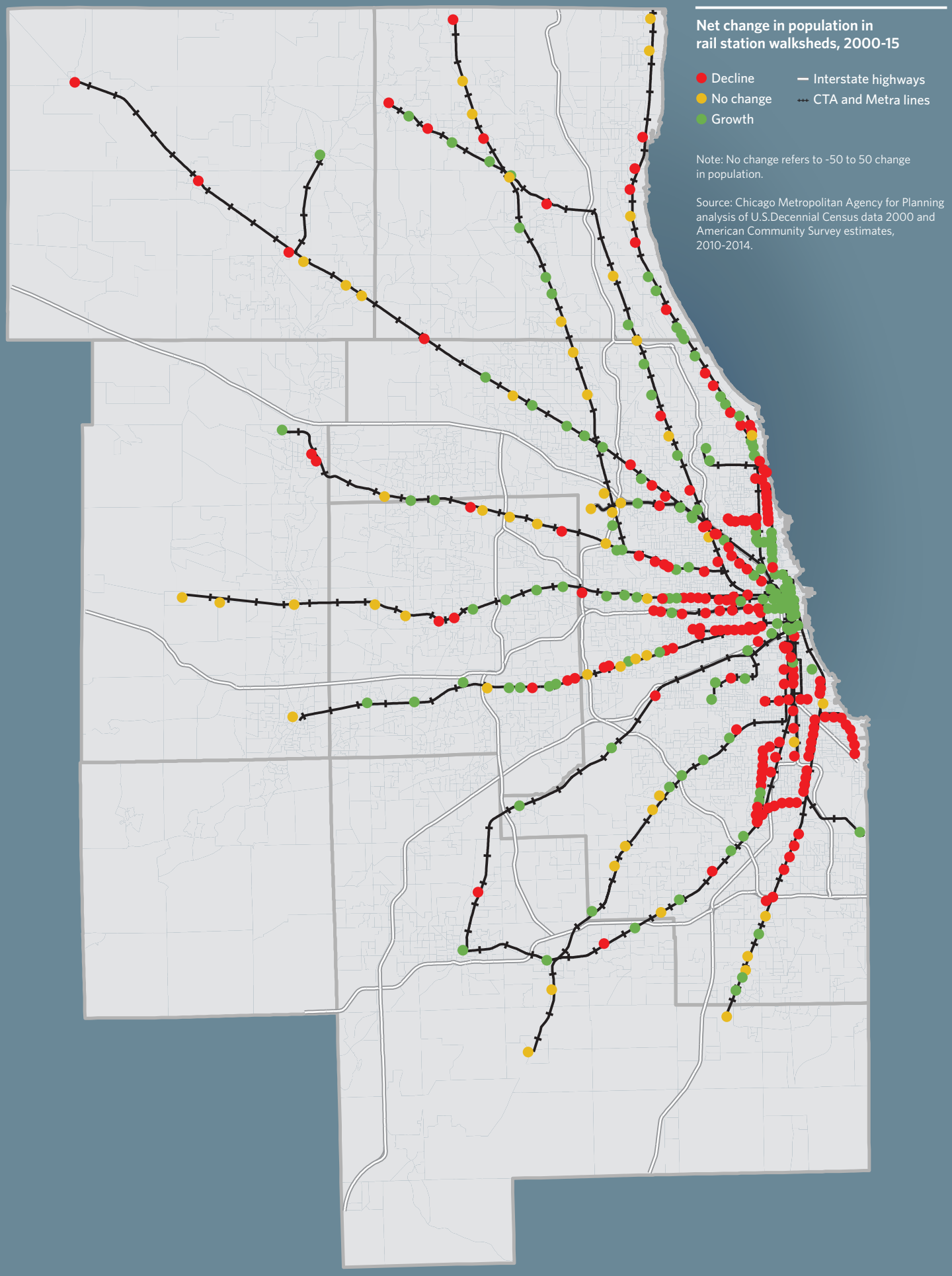


Net change in employment in rail station walksheds, 2000-15

- Decline
- No change
- Growth
- Interstate highways
- CTA and Metra lines

Note: No change refers to -50 to 50 change in number of jobs.

Source: Chicago Metropolitan Agency for Planning analysis of Illinois Department of Economic Security data, 2000 and 2015.


Net change in population in rail station walksheds, 2000-15
Decline
No change
Growth
Interstate highways
CTA and Metra lines
Note: No change refers to -50 to 50 change in population.
Source: Chicago Metropolitan Agency for Planning analysis of U.S.Decennial Census data 2000 and American Community Survey estimates, 2010-2014.

ON TO 2050 and Infill and TOD

Photo Credit: Steven Vance via Flickr, https://flic.kr/p/VaUDEU

Infill and TOD provide many quality of life and economic benefits to the region, yet they are only happening sporadically. While many residents desire a home or workplace in a walkable area with access to amenities,[4] many barriers exist to these types of developments. Planning for these areas is essential given the increased demand to live in pedestrian friendly and transit-served areas.

Building on GO TO 2040, ON TO 2050 will continue to recommend that the region focus development in places with existing development and infrastructure, particularly transit-rich areas. Findings from this snapshot will help refine the plan's recommendations regarding infill and TOD. The companion Reinvestment and Infill strategy paper will identify more specific strategies to promote infill, as well as the types of areas that should be a top priority.

Endnotes

1 "America in 2015: A ULI Survey of Views on Housing, Transportation, and Community," Urban Land Institute, 2015, http://cmap.is/2vHVAGg.

2 For more information on how CMAP measures transit availability, see http://cmap.is/1sW976x.

3 "Transit Ridership Growth Study," Chicago Metropolitan Agency for Planning, 2017, https://cmap.is/2iEppSk.

4 "America in 2015: A ULI Survey of Views on Housing, Transportation, and Community," Urban Land Institute, 2015, http://cmap.is/2vHVAGg.

Selected data used in the development of this report can be found at https://datahub.cmap.illinois.gov/group/on-to-2050-report-data.

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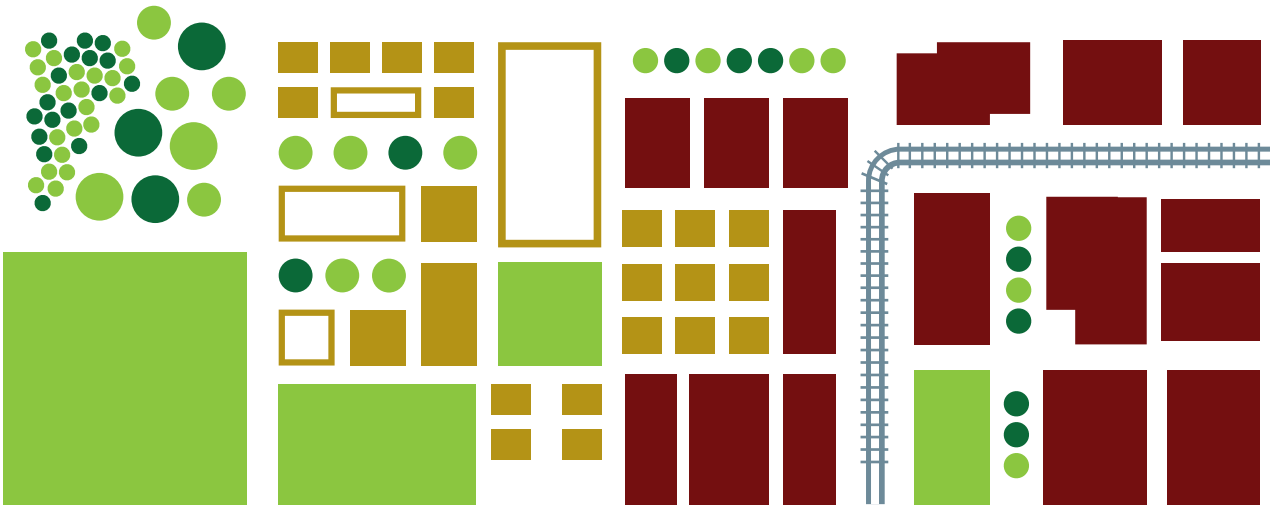
The Chicago Metropolitan Agency for Planning (CMAP) is our region's official comprehensive planning organization. The agency and its partners are developing ON TO 2050, a new comprehensive regional plan to help the seven counties and 284 communities of northeastern Illinois implement strategies that address transportation, housing, economic development, open space, the environment, and other quality-of-life issues. See www.cmap.illinois.gov for more information.

ON TO 2050 snapshot reports will offer data-driven summaries of regional trends and current conditions. These documents—as well as strategy papers—will define further research needs as the plan is being developed prior to adoption in October 2018.



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