ECONOMIC DEVELOPMENT STRATEGIC PLAN
CITY OF FORT WORTH, TEXAS

VOLUME 1: COMPETITIVENESS

DECEMBER 2017

TIP strategies
AUSTIN • SEATTLE

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TIP STRATEGIES, INC. is a privately held economic development consulting firm with offices in Austin and Seattle. TIP is committed to providing quality solutions for public and private sector clients. Established in 1995, the firm's primary focus is economic development strategic planning.

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FREGONESE ASSOCIATES is a Portland-based urban planning firm with expertise in citywide comprehensive planning as well as scenario planning and modeling in specific areas (such as downtowns and urban corridors). Established in 1997, the firm's work has been instrumental in the development and adoption of growth policies and land use plans in large cities and metro areas across the US and internationally.

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JLL is a member of the Fortune 500 and is a global professional services and investment management firm specializing in real estate. JLL's industry-leading research group delivers commercial real estate analysis and insights that drive value in real estate decisions and support successful strategies.

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ISAAC BARCHAS led the Austin Technology Incubator for 10 years, starting in 2006. Over that time, he has overseen the incubation of more than 200 companies. He is responsible for ATI's strategic direction and evolving the ATI economic model. Isaac remains active in the technology and venture capital communities in Austin and across the US and has been published in the *Washington Post*, *Wall Street Journal*, *Chicago Tribune*, and *Austin American Statesman*.

CONTENTS

ABOUT THIS WORK

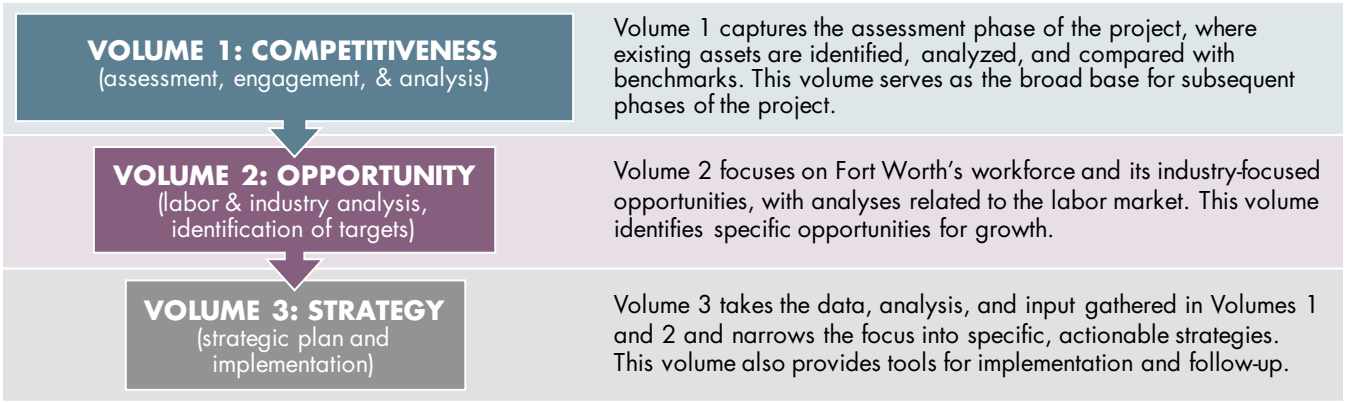
Over the last several decades, Fort Worth has been one of the fastest-growing large cities in the US. Fort Worth has a unique identity and brand that combines its rich cultural heritage with an economy driven by industry-leading employers like Lockheed Martin and American Airlines. The City has made strategic investments in districts from Sundance Square to Alliance, resulting in numerous waves of private sector investment and employment growth. However, all this has been achieved without a comprehensive, citywide approach for economic development. There is no question that Fort Worth is primed for greater economic prosperity. The challenge is not about growth in a general sense, it is about guiding growth that creates the highest overall benefit to the city. To accomplish this, future development will need to be channeled into specific districts, into generating higher income levels and capital investment, strengthening the local tax base, and supporting a more attractive environment for companies and skilled workers.

In response to these challenges, Fort Worth is embarking on its first economic development strategic plan, aimed at enhancing the city's status in the region and nation over the next five years and beyond. Working with TIP Strategies (an economic development consulting firm with office in Austin and Seattle) and their partners (Fregonese Associates, JLL, and Isaac Barchas), the City of Fort Worth has engaged the business community and local stakeholders to create a strategic framework to guide the City's economic development activities.

Volume 1 of the Economic Development Strategic Plan focuses on Fort Worth's economic competitiveness. To provide a foundation for the planning process, TIP conducted an assessment of relevant trends and characteristics that influence Fort Worth's economic potential. This document includes targeted analyses of the city's demographics, employment patterns, land use and real estate conditions, fiscal landscape, entrepreneurial ecosystem, and other qualitative and quantitative factors impacting Fort Worth's competitiveness.

To reach a deeper understanding of the current state of the area economy, data are shown for the city of Fort Worth, Tarrant County, the Fort Worth Metropolitan Division (MD), the Dallas-Fort Worth metropolitan area, the state of Texas, and the US. A review of strengths, weaknesses, opportunities, and threats identified during the planning process (a SWOT analysis) is also presented. Additionally, we compared Fort Worth to a group of 13 competitor cities in the Dallas-Fort Worth metro area (each city with a population above 100,000) on several factors. Lastly, we compared Fort Worth to a group of 16 peer/benchmark cities (8 domestic and 8 international) to provide a broader context for evaluating the city's relative economic strengths. This work serves as the basis for the identification of strategies in subsequent phases of this planning process.

The results of the planning process are presented in three interlinked volumes, described in the graphic below.



KEY FINDINGS

Arguably, Fort Worth has more development potential than any US city, with a land area of 340+ square miles encompassing a vibrant urban core (Sundance Square, Near Southside, and surrounding districts) and a dynamic suburban growth area (Alliance). The purpose of this strategic planning process is to guide Fort Worth on a path to becoming one of America's most livable cities and to help position the city to compete regionally, nationally, and internationally.

Most cities approach economic competitiveness from a reactionary stance, addressing weaknesses and avoiding threats. Fort Worth's success would be minimal with such a limited approach. The city is starting from a position of advantage, with numerous pre-existing strengths. Thus, our assessment of Fort Worth's economic competitiveness is viewed through the lens of distinct strengths and untapped opportunities.

It begins with an examination of the city's **assets and competitive advantages**, which include:

- Fort Worth had the fastest growing population among the 20 largest US cities from 2000 to 2016.
- The Dallas-Fort Worth metro area leads the country in employment and population growth.
- Fort Worth offers more vacant land available for development than any other city in the Dallas-Fort Worth metro area, in addition to major districts with capacity for development/redevelopment. These districts range from established areas like Downtown and Alliance to emerging districts like Panther Island.
- Fort Worth's transportation infrastructure reflects the city's history as a continental crossroads, evolving from stagecoaches to cattle drives, railroads to highways, and eventually to air-travel. Alliance and DFW International Airport continue this evolution in the 21st century, providing national and global connectivity.
- Fort Worth's economy is driven by diverse industry clusters including transportation & logistics (air, rail, trucking, and warehousing/distribution); aerospace manufacturing (including services, design, and R&D); life sciences (healthcare & medical products/services); oil & gas; and tourism.
- In addition to its impressive roster of corporations and major employers, Fort Worth benefits from a strong group of economic development partners (e.g., the City's Economic Development Department and the Fort Worth Chamber); anchor institutions (e.g., Texas Christian University (TCU), Tarrant County College (TCC), Texas Wesleyan University (TWU), and medical institutions); and philanthropic foundations.

Beyond the city's existing advantages, **untapped opportunities abound.**

- Residential development and population growth in Fort Worth has been robust, but employment growth in the city has lagged the rest of the Dallas-Fort Worth metro area—especially in high-wage professional jobs.
- Many recent high-profile corporate relocation projects in the metro area have landed outside Fort Worth's city limits (e.g., Toyota in Plano and Charles Schwab in Westlake).
- The influx of tech firms and IT workers has also largely bypassed Fort Worth in favor of locations in Dallas, Richardson, Plano, and Irving. Yet, the metro area lacks a strong geographic cluster of tech/startup activity, leaving the door open for development of one or more tech/innovation districts in Fort Worth.
- Relative to other large US cities, Fort Worth struggles with external visibility and name recognition, especially in comparison to Dallas.
- Despite a unique blend of visitor destinations (Sundance Square, the Stockyards, and the Cultural District), Fort Worth underperforms surrounding cities in terms of hotel revenues, indicating unmet demand.

- Fort Worth's economic development program currently operates without a strategic framework to guide investment decisions, programs, and collaborative efforts aimed at strengthening the local economy.

Our assessment of Fort Worth's economic competitiveness was based on an extensive quantitative analysis, coupled with qualitative input from stakeholder interviews and focus groups, neighborhood workshops, and the guidance of City staff and elected officials. Major aspects of this wide-ranging analysis are presented in the Reference Appendix. The objective of this "Key Findings" section is to filter through the myriad issues that influence the City's competitive position and hone in on those that should inform subsequent phases of the planning process. These key findings have been distilled into five focus areas, which form the outline for discussion:

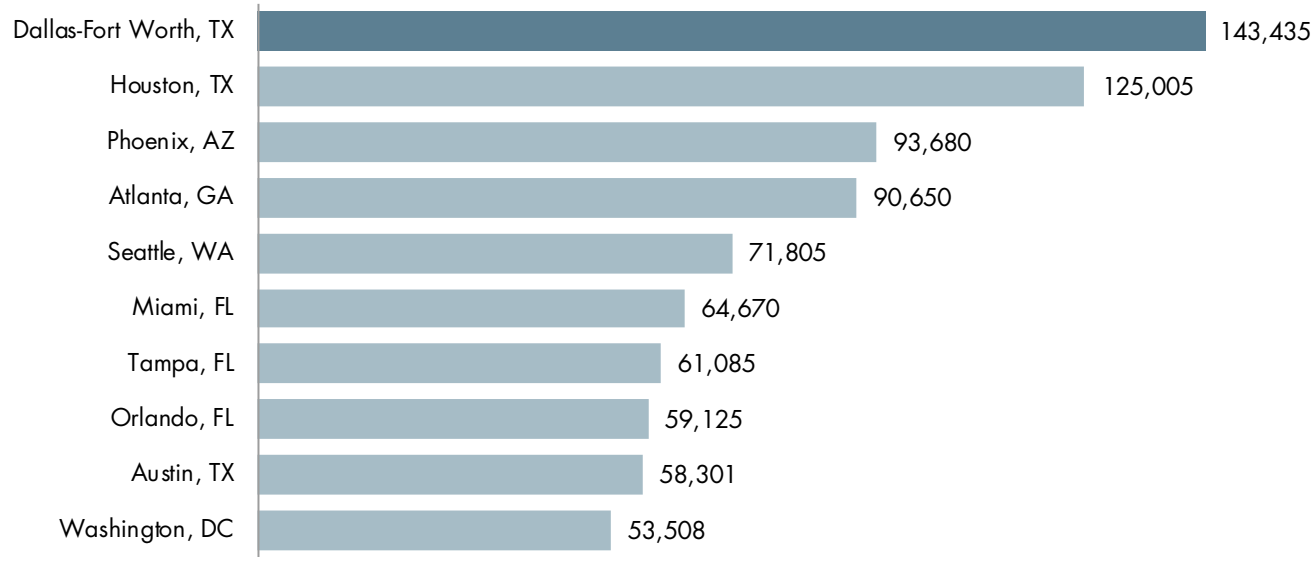
1. Growth Trends
2. Implications of Land Use
3. Districts as Drivers
4. External Visibility
5. Economic Development in Fort Worth

GROWTH TRENDS

*DALLAS-FORT WORTH IS THE **NATIONAL LEADER** IN EMPLOYMENT & POPULATION GROWTH.*

The Dallas-Fort Worth metro area is gaining residents at a much higher rate than any region in the US. In a single year (July 1, 2015 to July 1, 2016), the metro area gained more than 143,000 net new residents. The Houston metro area experienced the second highest gain (125,000 new residents), but its growth slowed somewhat in recent months due to the struggling oil and gas sector. No other metro area added more than 100,000 to its population during this period. According to data from the US Bureau of Labor Statistics (not shown here), the most recent employment growth trends for major metros paint the same picture. For the 12 months ending in April 2017, Dallas-Fort Worth gained 105,000 net new jobs, more than any other US metro area. The Atlanta and New York metros ranked a distant second and third with 87,000 and 83,000 net new jobs respectively.

FIGURE 1. TOP 10 METRO AREAS RANKED BY POPULATION GROWTH, 2015-2016

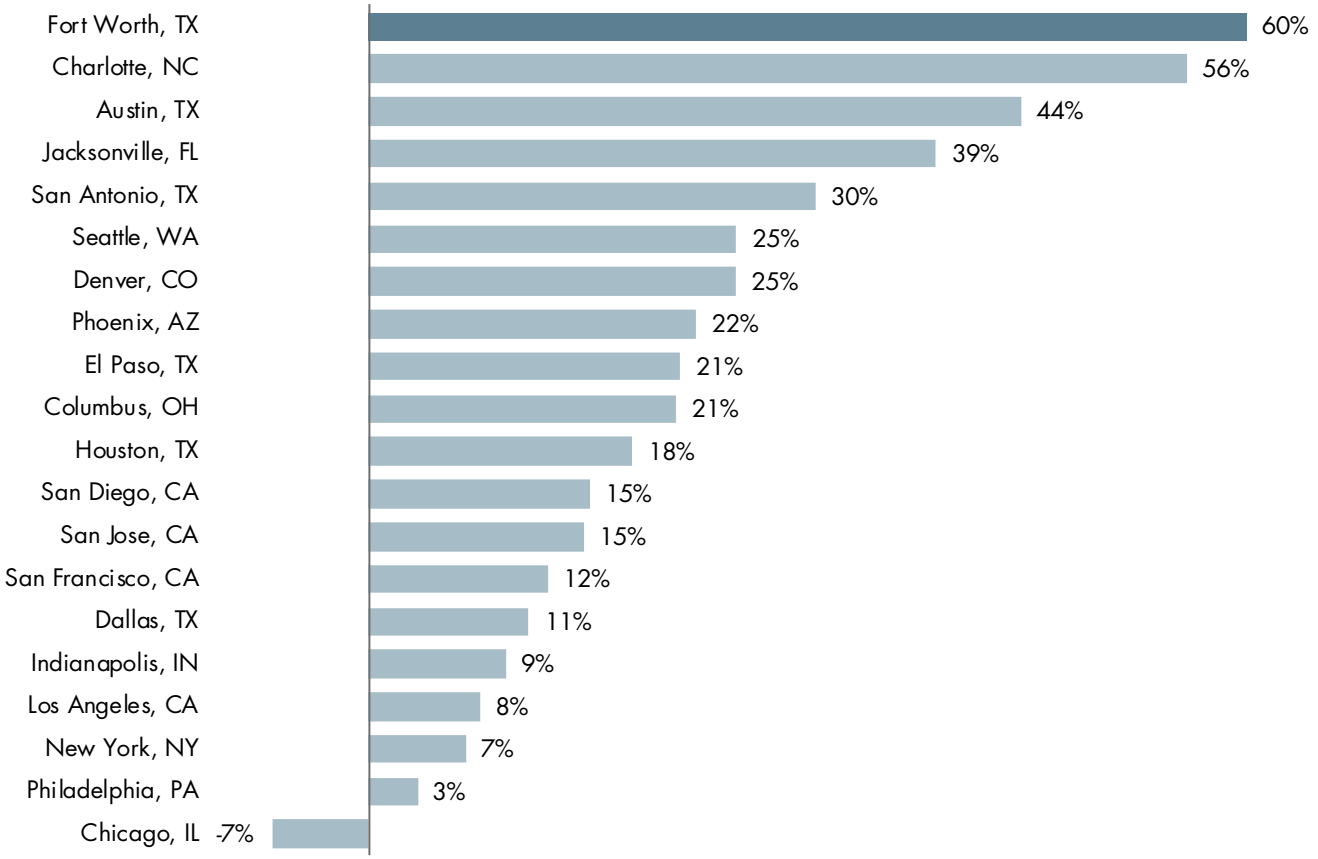


Source: US Census Bureau, Population Estimates Program.

*FORT WORTH IS THE **FASTEST GROWING**, AMONG THE 20 LARGEST US CITIES.*

Since 2000, Fort Worth's residential base has grown faster than any other big city. This is due, in large part, to the city's unique geography. Within Fort Worth's municipal boundaries lie a range of districts spanning the entire urban-to-suburban transect. Some of the city's population growth has taken place in the downtown and surrounding urban districts, but the lion's share of growth in Fort Worth occurred "outside the loop" (Loop IH-820). This dynamic is shared with the other fastest-growing cities. Charlotte has numerous suburban growth centers along Loop IH-485, Austin has The Domain, San Antonio has Stone Oak, and Jacksonville has a diversity of suburban districts within its city limits. By comparison, Denver and Seattle are the two fastest-growing cities where nearly all growth has been urban in nature. Since 2010, Denver and Seattle actually grew at a slightly higher pace than Fort Worth (16 percent vs. 15 percent), indicating that growth in major cities does not have to rely on suburban centers.

FIGURE 2. NET POPULATION CHANGE IN 20 LARGEST US CITIES, 2000-2016



Source: US Census Bureau, Population Estimates Program.

*DALLAS-FORT WORTH IS A **TALENT MAGNET**, DRAWING NEW RESIDENTS FROM ACROSS THE US.*

Not only is the Dallas-Fort Worth metro area growing rapidly, it is attracting numerous residents from other major metros. From 2010 to 2014, on a net basis (including inflow and outflow), Dallas-Fort Worth attracted more than 12,000 new residents from Chicago, nearly 11,000 new residents from New York, and over 9,000 new residents from Los Angeles. The only metro areas "winning the talent competition" against the Dallas-Fort Worth metro area are in Texas: Austin (net gain of 8,000 residents from Dallas-Fort Worth) and Houston (5,000 net migrants from Dallas-Fort Worth). Within the region, Tarrant County has gained many net new residents (more than 9,000 from 2010 to 2015) from Dallas County.

FIGURE 3. NET DOMESTIC MIGRATION TO/FROM DALLAS-FORT WORTH METRO AREA, 2010-2014
NET MIGRATION INBOUND TO (AND OUTBOUND FROM) DALLAS-FORT WORTH MSA

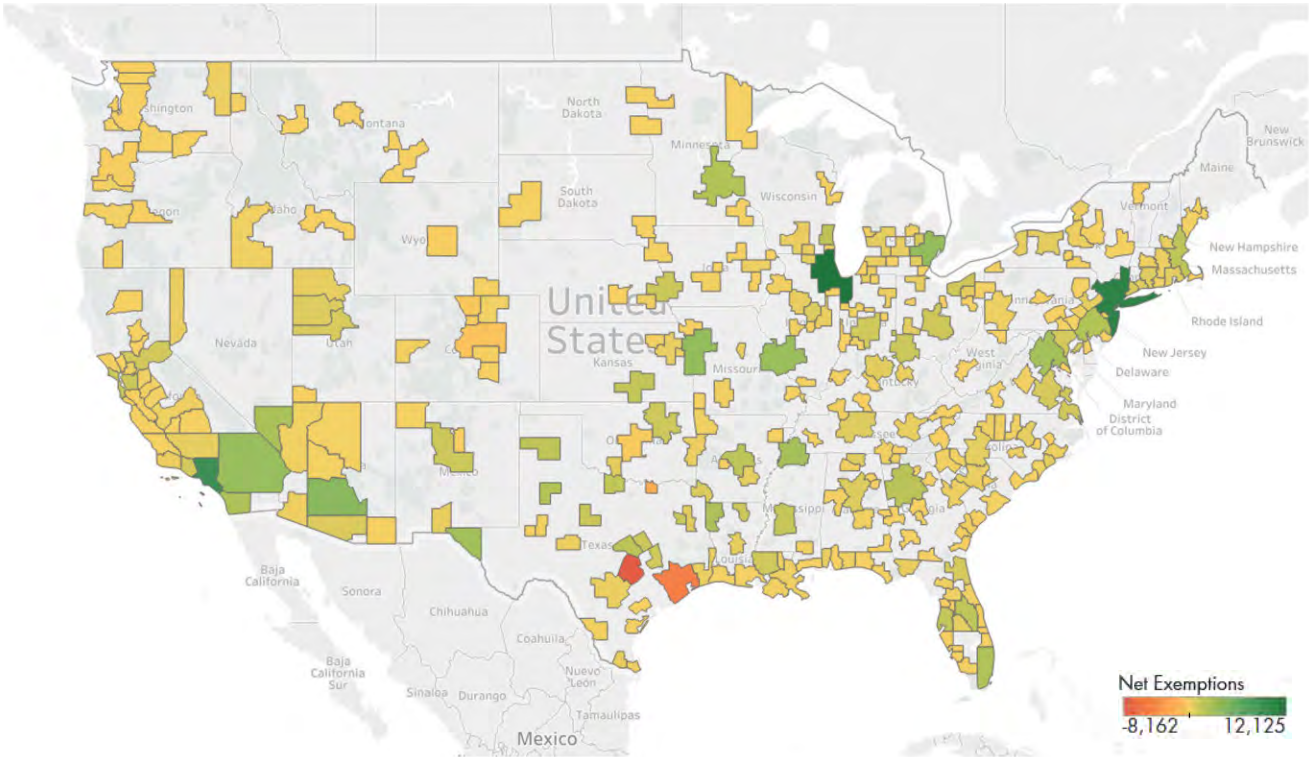
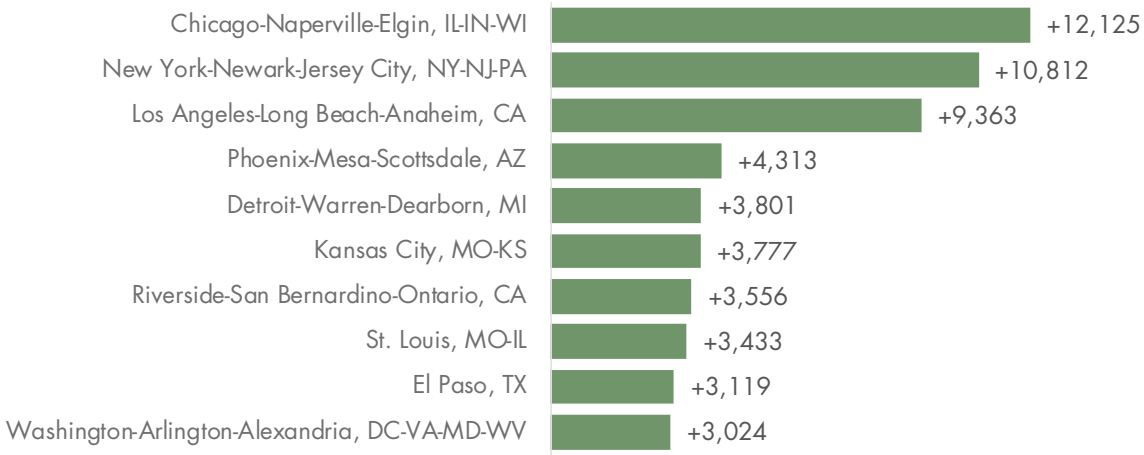


FIGURE 4. NET MIGRATION FLOWS TO/FROM THE DALLAS-FORT WORTH MSA, 2010-2014
TOP 10 DOMESTIC ORIGINS FOR NET MIGRANTS RELOCATING TO THE METROPLEX



Source: IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Dallas-Fort Worth MSA counties from outside the area) and outbound migrants (those relocating from the Dallas-Fort Worth MSA to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

IMPLICATIONS OF LAND USE

*THE CITY HAS **A VAST RESERVE OF LAND** (VACANT PROPERTIES & REDEVELOPMENT SITES) THAT CAN DRIVE ECONOMIC GROWTH.*

According to estimates from the North Central Texas Council of Governments (NCTCOG), Fort Worth's vacant developable land (over 70,000 acres) exceeds every other city in the Dallas-Fort Worth metro area. Fort Worth has more than twice the area of vacant land of Dallas (less than 30,000 acres) and has more developable acreage than the four largest cities in Collin County combined (Frisco, McKinney, Plano, and Allen).

FIGURE 5. ACRES OF VACANT LAND, 2010, METRO AREA CITIES WITH POPULATIONS OF 100K+

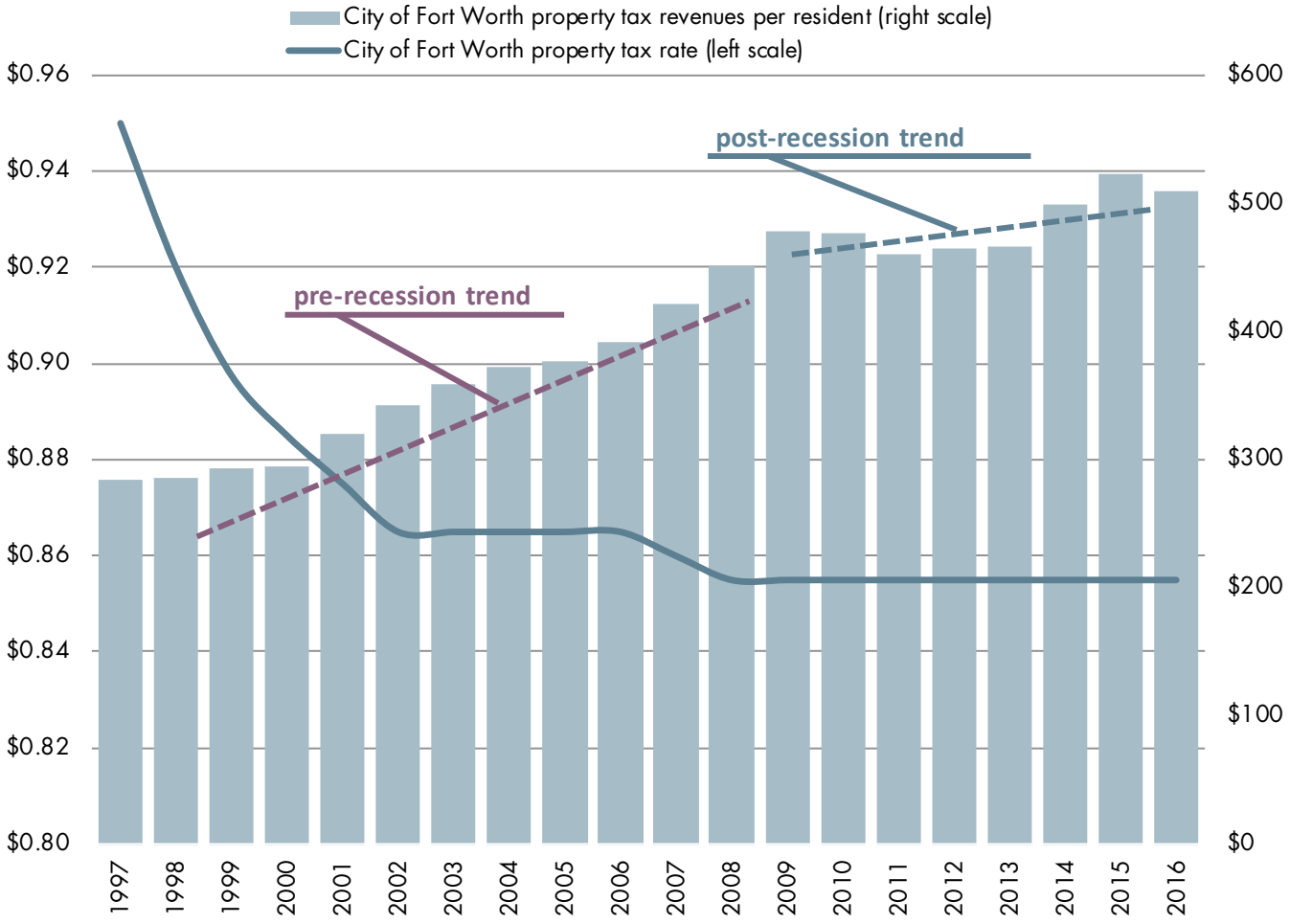
Source: North Central Texas Council of Governments.

IN THE ABSENCE OF A FOCUSED BUSINESS DEVELOPMENT EFFORT, ***RESIDENTIAL USES DOMINATE*** *THE TAX BASE.*

From 2010 to 2016, Fort Worth gained nearly 13,000 net new single-family housing units. No other city in the metro area gained more than 10,000. At the same time, Dallas experienced a net loss of 572 single-family units, while gaining more than 20,000 net new multi-family units. By contrast, Fort Worth only gained about 7,000 multi-family units in this period.

When you combine these trends with the much higher level of employment growth in the Dallas side of the metro area—especially high-wage professional jobs—Fort Worth appears to be on its way to becoming a suburb of Dallas County. The fiscal challenges of growth driven by single-family residential development are illustrated below. A healthy tax base for a large central city must rely on high levels of business investment and employment growth. A center-city tax base dominated by residential uses is not sustainable for Fort Worth.

FIGURE 6. AVERAGE PROPERTY TAX REVENUE PER FORT WORTH RESIDENT
LONG-TERM TRENDS IN PROPERTY TAX RATES AND PER-CAPITA REVENUES



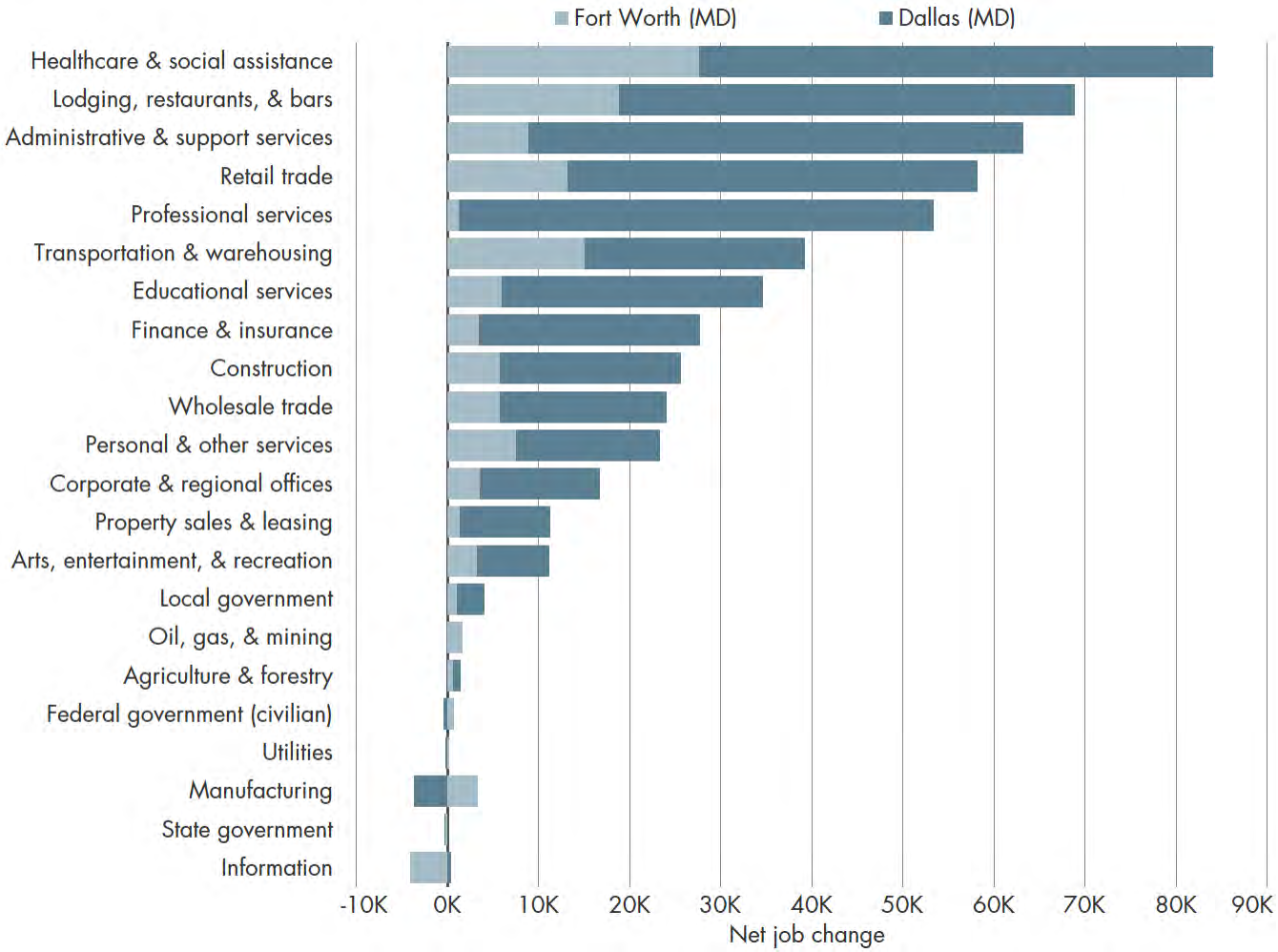
Source: City of Fort Worth, Comprehensive Annual Financial Report, FY 2016, pp. 197, 202-203.
Note: Rates applied per $100 of assessed valuation.

*REGIONAL JOB GROWTH DRAWS FORT WORTH RESIDENTS **OUTSIDE THE CITY** FOR WORK.*

Employment growth from 2010 to 2016 in the Fort Worth Metropolitan Division (MD) versus the Dallas MD reveals a concerning trend. (See Metropolitan Divisions, page 19, for a definition of this geography.) The six-county Fort Worth MD accounts for 30 percent of all jobs in the Dallas-Fort Worth metro area (nearly 1.1 million jobs), compared with roughly 2.6 million jobs in the Dallas MD, 70 percent of the metro area's total employment. From 2010 to 2016, the Dallas MD job base grew by 19 percent, while the Fort Worth MD grew by 14 percent. Growth in sectors filled with high-wage professional jobs (corporate headquarters, professional services, information, and finance & insurance) has taken place almost exclusively on the Dallas side of the metro area. The imbalance between residential and commercial growth discussed previously is also a factor in the city's commuting patterns and helps to create further imbalance in the city's jobs-to-housing ratio (next page).

The metro area office market is responding to these job growth trends. Per the most recent data from JLL (Q1 2017) the Far North Dallas submarket, the swath of land along the Dallas North Tollway stretching from Addison to Frisco, accounts for about 55 percent of the metro area's current office construction (over 6.4 million square feet of office space), more than 15 times the amount of construction in Fort Worth.

FIGURE 7. NET CHG. IN JOBS BY SECTOR IN THE DALLAS-FORT WORTH MSA (BY MD), 2010–2016



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

*CURRENT TRENDS IMPLY THAT FORT WORTH'S **JOBS-HOUSEHOLD BALANCE IS SLOWLY ERODING**.*

Fort Worth had a jobs-household ratio of 2.06 in 2005. The NCTCOG 2040 forecast expects the ratio to drop to 1.74 by 2040. The metro area, however, is forecast to become more jobs-rich, increasing from a ratio of 1.80 in 2005 to 1.91 in 2040. This implies that Fort Worth—the primary employment center in Tarrant County—would become more residential by 2040, and the surrounding suburbs would become much more commercial and industrial. This is not consistent with the direction of City policy, nor is it a trend seen in other major central cities. Central cities typically retain a higher concentration of jobs (relative to households) than do surrounding suburbs. Fort Worth can and should aim to retain an employment concentration ratio of two or more jobs per household.

FIGURE 8. JOBS-HOUSEHOLD COMPARISON

JURISDICTION	JOBS-HOUSEHOLD RATIO 2005	JOBS-HOUSEHOLDS RATIO 2040
City of Fort Worth	2.06	1.74
Fort Worth ETJ (extra territorial jurisdiction)	1.95	1.58
Four-county area (Tarrant, Dallas, Collin, and Denton)	1.80	1.91

Source: NCTCOG Regional Forecast for 2040

DISTRICTS AS DRIVERS

*FORT WORTH HAS **DISTRICTS AT DIFFERENT STAGES** OF THEIR LIFE CYCLE, WHICH CAN SERVE AS DRIVERS FOR ECONOMIC DEVELOPMENT.*

Beyond the staggering amount of raw land available for development within the city limits, Fort Worth also has an array of defined districts with citywide economic development potential. Some of these areas are mature and largely built out but contain significant redevelopment opportunities, while other districts are only beginning to emerge as locations for new investment and development. The districts with the greatest opportunities for economic development can be grouped into three categories:

1. **Mature districts (land constraints & redevelopment-focused).** Fort Worth, like most large central cities, has multiple districts in its urban core that have served as business and visitor destinations for decades. These areas have little or no vacant land, but hold significant redevelopment potential. They include
   - Downtown Fort Worth/Sundance Square
   - The Stockyards
   - Cultural District
2. **Established/emerging districts (significant capacity remaining).** Beyond the city's long-standing activity centers, new areas have emerged as major economic drivers for the local and regional economy. These districts have already benefited from billions of dollars of new investment in recent years, but still contain major development and redevelopment opportunities that can drive future growth. They include:
   - Alliance
   - Near Southside

3. **Long-term plays (15- to 25-year build-out).** New districts are taking shape that will provide substantial development opportunities over the next quarter century. These areas will initially be dominated by residential development, but over time, will provide the city with new locations for business growth. They include:
    - Panther Island
    - Walsh Ranch
    - Chisholm Trail Parkway

In addition to the primary districts that drive citywide economic development, **a second tier of six target areas has been identified**. These areas were evaluated as part of the planning process for their capacity to support new commercial and residential development. This analysis, led by Fregonese Associates and published separately, includes mapping of land uses, the identification of vacant properties and potential redevelopment opportunities, and the establishment of target employment levels. This work formed the basis for a discussion of strategies for economic development in the target areas and similarly positioned neighborhoods and corridors citywide, which are incorporated in Volume 3.

The six target areas are:

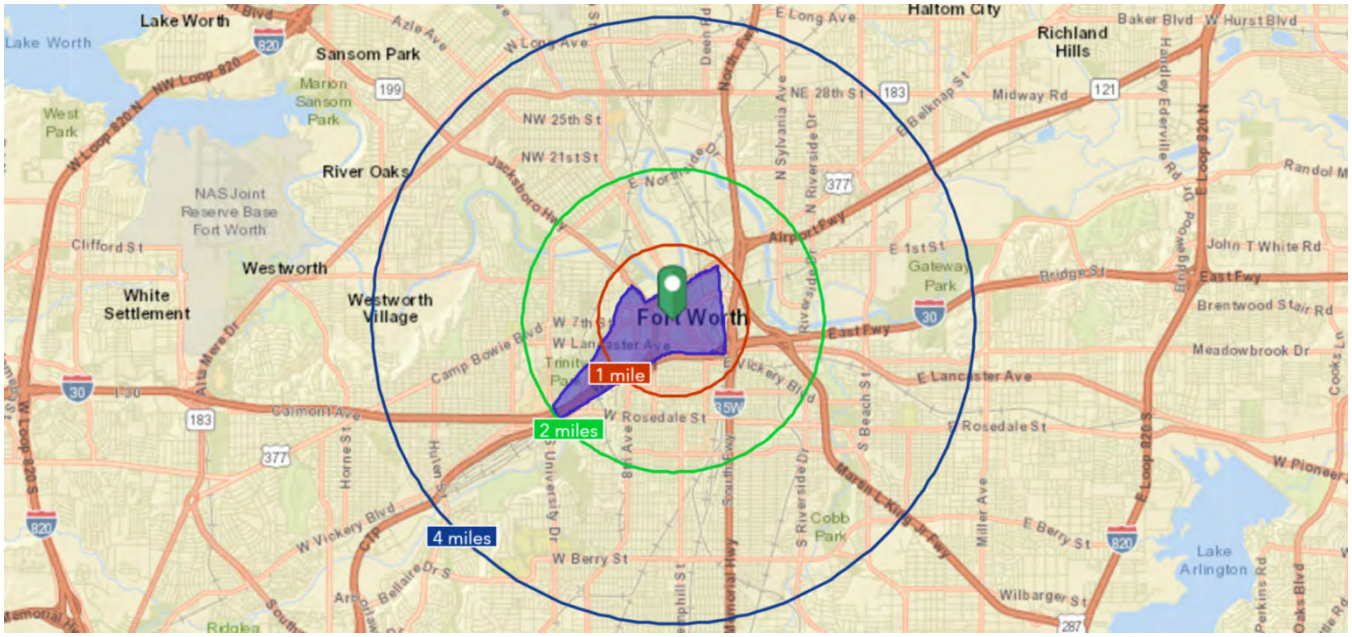
- Evans & Rosedale
- Stop Six
- West Camp Bowie
- Altamesa & McCart
- Near Northside
- East Lancaster

*HARNESSING **THE POTENTIAL OF THE URBAN CORE** (DOWNTOWN & SURROUNDING DISTRICTS) WILL BE CRITICAL TO THE CITY'S FUTURE.*

Each of the three major groupings of districts described in the previous page—mature, established/emerging, and long-term plays—includes at least one district located within Fort Worth's urban core. Downtown Fort Worth is the largest single employment center in Tarrant County. The Near Southside medical district is the largest single healthcare employment cluster in all North Texas. The Panther Island development is on its way toward becoming one of the densest urban neighborhoods in Texas. The Stockyards and Cultural District help preserve the city's unique heritage, while supporting a vibrant tourism sector.

The emphasis on Fort Worth's urban core as a specific focus area for this plan does not take away from development in Alliance, CentrePort, or other locations outside of the urban core. These areas add value to the local economy. But the city's urban core is what makes Fort Worth unique and differentiates the city from its competition. Arlington has its stadium/entertainment district. Frisco has its "Five Billion Dollar Mile." But only Dallas and Fort Worth have large central business districts surrounded by other authentic urban districts/corridors. Moreover, Fort Worth's downtown and its surrounding urban districts—including the close-in target areas that have struggled to develop (Evans & Rosedale, Near Northside, and East Lancaster—are where public resources can and should play the biggest role in facilitating economic development. According to recent data from Esri (Figure 9), urban residential growth is accelerating in the city's urban core. The 2016 Downtown Fort Worth, Inc. annual report confirms these trends.

FIGURE 9. POPULATION GROWTH TRENDS IN FORT WORTH'S URBAN CORE, 2000–2016



Geography	2000 Pop.	2010 Pop.	2016 Pop.	2000-2010 Annual % Chg.	2010-2016 Annual % Chg.
CBD 1-Mile	7,113	6,584	8,254	-0.7%	+4.2%
CBD 2-Mile	25,751	24,476	27,562	-0.5%	+2.1%
CBD 4-Mile	160,648	159,489	168,655	-0.1%	+1.0%
City of Fort Worth	545,993	744,973	854,113	+3.6%	+2.4%

Sources: urbanSCALE.com, Esri Community Analyst, TIP Strategies.

EXTERNAL VISIBILITY

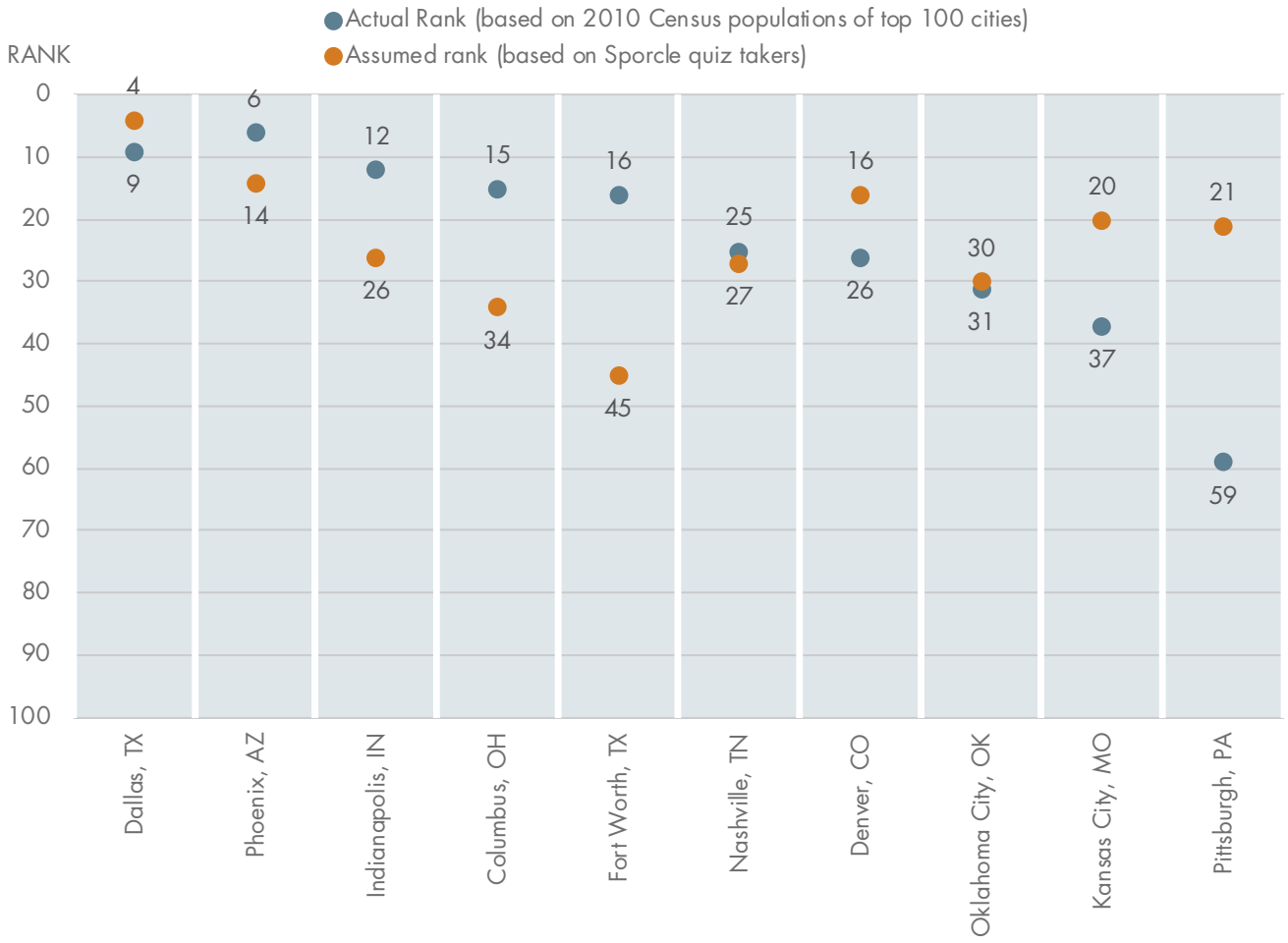
*FORT WORTH HAS RELATIVELY **LOW EXTERNAL VISIBILITY** AMONG LARGE US CITIES.*

Beyond traditional economic and demographic data sources, nontraditional data can often reveal new insights into the dynamics of cities and metro areas. One such data source, Sporcle, illustrates the challenges facing Fort Worth in terms of its external visibility and image. Sporcle is an online provider of quizzes, trivia, and other brain teasers. In 2016, Carl Bialik (former lead writer for FiveThirtyEight, now data science editor with Yelp) analyzed the results of a Sporcle quiz that asked participants to name the 100 most populous US cities in under 12 minutes. Based on a sample of about 500,000 people, Fort Worth is one of the least identifiable big cities in the US. Relative to population size, fewer people could identify Fort Worth than they could any of the other eight US cities selected as benchmarks for this study.

The title of the FiveThirtyEight article—*San Jose Is the Most Forgettable Major American City*—is a harsh attention-grabbing headline, but it raises an important issue about San Jose. Despite being the nation's 10th most populous city and the center of Silicon Valley, it lives under the shadow of San Francisco. This should sound all too familiar to people in Fort Worth. The city often struggles to step out of Dallas's shadow. Dallas is the nation's 9th largest city, but was assumed as the 4th most populated city in the Sporcle quiz. This happens to align with the population rank of the *Dallas-Fort Worth MSA* as the 4th largest in the US, but has apparently become associated with the city of Dallas alone, possibly due to greater name recognition. Fort Worth, on the other hand, is the 16th largest city, but ranked 45th in the quiz. Among the benchmark

cities listed below, Phoenix, Indianapolis, and Columbus were also assumed to rank lower than their actual populations. By contrast, Denver, Kansas City, and Pittsburgh were assumed to be larger. Nashville and Oklahoma City had a perception in line with their actual size. Nonetheless, this exercise is only a measure of external visibility, not external perceptions. It matters that far fewer people can recognize Fort Worth as one of the nation's large cities compared to those who recognize Dallas. *But it matters equally how people view Fort Worth*, especially how the city is viewed by business decision makers (e.g., corporate executives, real estate brokers, and site location consultants).

FIGURE 10. FORT WORTH & BENCHMARK CITIES, ACTUAL & ASSUMED POPULATION RANKS

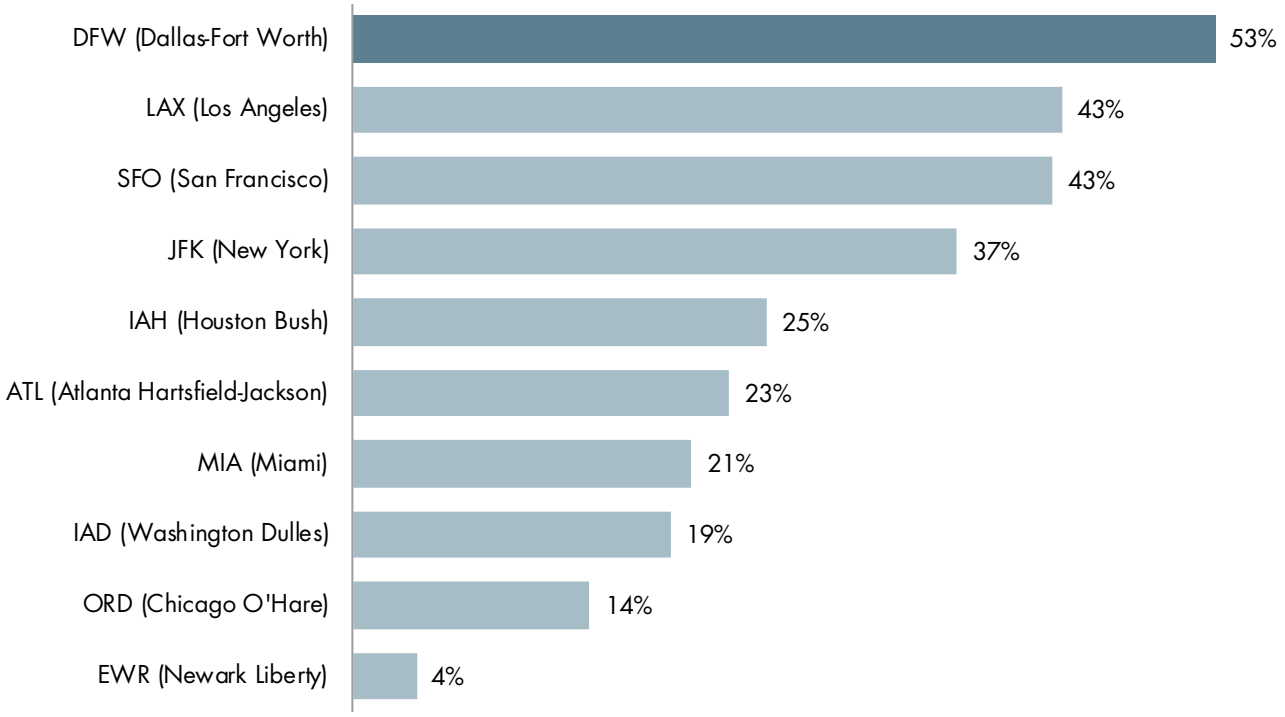


Source: Sporcle, via fivethirtyeight.com.
Notes: Based on a self-selected online quiz, with results measured between September 26, 2009 and February 22, 2016

*FORT WORTH HAS A UNIQUE ASSET TO LEVERAGE FOR ENHANCING THE CITY'S EXTERNAL VISIBILITY…**IT'S NOT "DALLAS INTERNATIONAL AIRPORT" IT'S DFW*.

Fort Worth and Dallas are the owners of DFW International Airport. DFW is the 4th busiest airport in the US in terms of total passenger traffic. It has more than 200 nonstop destinations, including over 50 international airports. Among the 10 busiest US airports, DFW's level of international passenger traffic is growing at the highest rate (53 percent growth of monthly international passengers from 2010 to 2016). Given the airport's global reach and its recent growth trajectory—and the fact that "Fort Worth" is two-thirds of the airport's name—DFW International Airport is clearly one of Fort Worth's strongest assets.

FIGURE 11. PERCENT GROWTH IN AVERAGE MONTHLY INTERNATIONAL PASSENGERS
AMONG 10 BUSIEST US AIRPORTS, 2010-2016*



*2016 data is through November.
Source: US Department of Transportation, Bureau of Transportation Statistics.

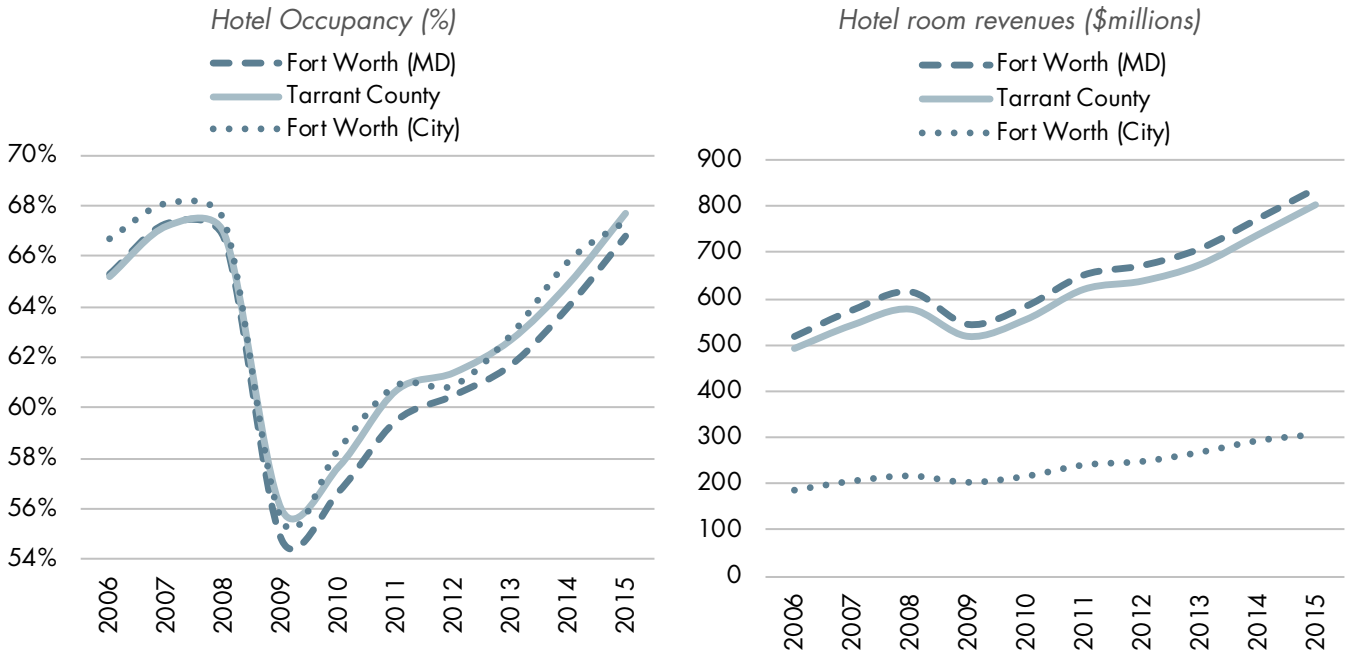
*FORT WORTH IS A **VISITOR DESTINATION** WITH UNTAPPED POTENTIAL.*

Hotel room revenues in the Fort Worth MD topped $800 million for the first time in 2015. Most of these revenues were generated in Tarrant County. In similar US, urban areas, one might expect the central city (and especially the central business district) of a large metropolitan county to be the major local generator of hotel revenues. Fort Worth does not fit that pattern, and indeed, the city's hotel revenues make up less than half of the county total. The offset is likely due to the major hotels in and around DFW International Airport that lie outside the City's jurisdiction as well as the major hotel/entertainment complex located in Grapevine and the recreational facilities clustered in Arlington.

Fort Worth's hotel market is under-developed relative to neighboring Tarrant County cities and Dallas. The city of Dallas accounts for 46 percent of hotel revenues in the Dallas MD compared with Fort Worth, which accounts for 36 percent of hotel revenues in the Fort Worth MD. These statistics point to an unmet need and opportunity for additional hotel development, especially large hotels in downtown Fort Worth. The community would benefit from further analysis of the CBD and citywide hotel market to provide a better understanding of the opportunity. (See recommendations in Volume 3.)

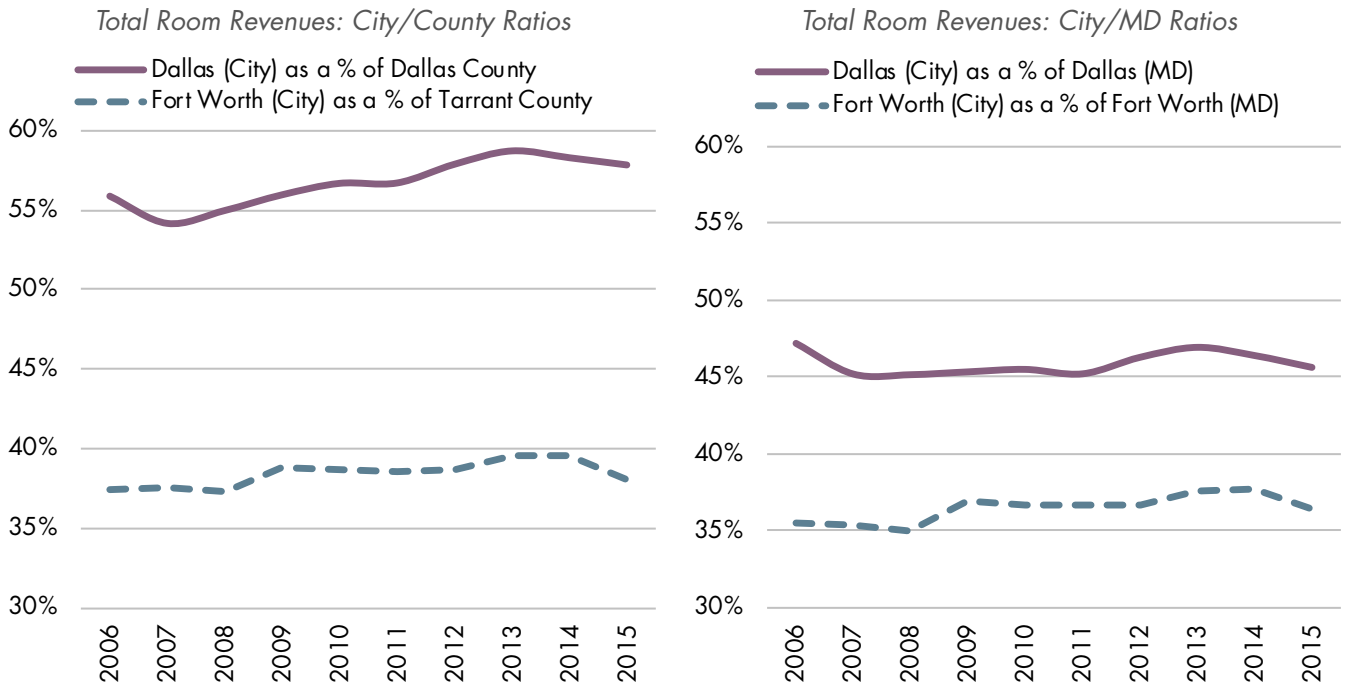
Beyond the impacts of tourism, Fort Worth could also benefit more from business travel. The potential for greater collaboration between Fort Worth's business recruitment program and its conference/event recruitment efforts led by the Fort Worth Convention & Visitors Bureau (CVB) is significant. The recruitment of new businesses can be facilitated through City/Chamber/CVB partnerships to target the attraction of events and conferences that attract decision makers representing specific companies and industries that align well with Fort Worth's assets.

FIGURE 12. TOURISM INDICATORS: HOTEL ROOM OCCUPANCY RATES & ROOM REVENUES



Source: Office of the Governor, Economic Development & Tourism, Texas Hotel Performance Reports.

FIGURE 13. TOURISM INDICATORS: CENTRAL CITY MARKET SHARE OF ROOM REVENUES



Source: Office of the Governor, Economic Development & Tourism, Texas Hotel Performance Reports.

ECONOMIC DEVELOPMENT IN FORT WORTH

*ECONOMIC DEVELOPMENT IS A **SHARED RESPONSIBILITY** AMONG LOCAL ENTITIES.*

Economic development is not the sole jurisdiction of the City of Fort Worth Economic Development Department. The Fort Worth Chamber of Commerce, other City departments, and a variety of local and regional partners play critical roles in growing and strengthening the Fort Worth economy. Continued, increased collaboration among these partners (highlighted in the diagram below) is a necessary outcome of this strategic plan. The existing assets available for economic development in Fort Worth far outweigh the assets available in most communities. The graphic below shows the range of physical, financial, and organizational assets existing in Fort Worth. This is not intended to be an exhaustive listing of every asset related to economic development in Fort Worth, but instead, is meant to inform the planning process including strategy development and recommendations for organizational structure and alignment.

ATTRACTIONS
Amon Carter Museum
Botanic Garden
Casa Mañana
Kimbell Art Museum
Stockyards
Sundance Square
Trinity Park
Will Rogers Memorial Ctr.

CONNECTIVITY
Alliance Airport
BNSF
DFW Airport
I-20 / I-30 / I-35
Union Pacific
TEXRail
Tower 55
TRE Commuter Rail
Trinity Trails

DISTRICTS
Cultural District
Downtown
Camp Bowie
Medical District
Near Southside
River District
Stockyards
West 7th

RESIDENTS
Children
Families
Millennials
Seniors
Students

INSTITUTIONS
Baylor Scott & White All Saints
Cook Children's
FWISD
JPS
Southwestern Baptist Theological Seminary
Tarleton State University
TCC
TCU
TCU & UNTHSC Medical School
Texas A&M Law School
Texas Health Harris
Texas Wesleyan University
UNT Health Sciences Center
UT Southwestern/Moncrief Cancer Institute
UTA-Fort Worth

PARTNERS
Cultural District Alliance
DFW International Airport
Downtown Fort Worth, Inc.
East Fort Worth Bus Assoc.
East Fort Worth Inc.
Fort Worth Chamber
Fort Worth Convention & Visitors Bureau
Fort Worth Film Commission
Fort Worth Hispanic Chamber
Fort Worth Metropolitan Black Chamber
Fort Worth Transportation Authority
Hillwood
NCTCOG
Near Southside, Inc.
Southeast Fort Worth, Inc.
Real Estate Council of Greater Fort Worth
Regional Hispanic Contractors Association
Sundance Square
Tarrant County
Tarrant Regional Water District
Tech Fort Worth
Trinity River Vision Authority
Workforce Solutions

CORPORATE TAX BASE
Alcon Labs
AMR/American Airlines
Bell Helicopter
Chesapeake
Sundance Square
TU Electric
XTO Energy
Wal-Mart

PHILANTHROPISTS
Burnett Foundation
Amon Carter Foundation
Kimbell Art Foundation
Rainwater Foundation
Sid W. Richardson Foundation & other Bass family foundations

MAJOR EMPLOYERS
AMR/American
City of Fort Worth
Cook Children's
Fort Worth ISD
JPS Health Network
Lockheed Martin
NAS Joint Base
Tarrant County College

A new strategic framework for economic development in Fort Worth will require the community's efforts to be focused on two primary areas: 1) baseline economic development activities; and 2) new and highly tactical initiatives.

*FORT WORTH'S PARTNERS MUST EXPAND AND ADD TO CURRENT **BASELINE ECONOMIC DEVELOPMENT ACTIVITIES**.*

Baseline economic development activities include efforts that all communities need to compete successfully for businesses, investment, jobs, and skilled workers. Fort Worth is already tackling most of these activities with varying levels of success. To advance the City's economic development program to the next level, new and/or expanded efforts will be required. These include (at a minimum):

- **Business retention & expansion (BRE).** The US Small Business Administration estimates that roughly 60 percent of new jobs in a community are created through the expansion of existing businesses. Fort Worth's existing employers and industries form the foundation of the local economy. The City and its partners must continue and expand their BRE programs to facilitate the ongoing success of local employers.
- **Target industries.** Fort Worth's economy is defined by strong existing industry clusters with additional growth potential. These include established sectors such as transportation & warehousing, manufacturing, healthcare, oil & gas, and tourism. These also include emerging sectors with high-growth potential in Fort Worth like corporate & regional headquarters, professional services (legal, IT, marketing), international business, aerospace manufacturing & design, and transportation innovation. These industries (and other potential growth sectors) are explored in detail in Volume 2: Industry & Occupation. The identification of target industries is a good starting point, but the list of industries being targeted matters far less than what a community does to actually "target" an industry. Strategies encompass marketing and recruitment initiatives, incentives, and policies to support growth, and talent and workforce initiatives.
- **Marketing.** A successful marketing program requires highly tailored messaging aimed at target industries. Generic marketing and promotional efforts aimed at convincing people that Fort Worth is a "great place to live, work, and play" will not be sufficient to differentiate the city for business recruitment.
- **Incentives.** The Dallas-Fort Worth metro area is an intensely competitive environment and Fort Worth needs a strong set of incentives to be a successful player in the regional competition for jobs and investment. The City's existing incentive policies and programs have been evaluated holistically to ensure that Fort Worth is leveraging its public resources through a citywide framework to channel and focus growth in specific geographic areas and in target industries.
- **Workforce & industry partnerships.** Per *Area Development's* "30th Annual Survey of Corporate Executives (Q1 2016)," access to a skilled workforce ranked first among 36 site selection factors. Ensuring a sufficient pipeline of workers to support the needs of current and future employers will require a combination of targeted recruitment efforts and workforce development initiatives. In Fort Worth, this will involve the continuation of existing partnerships like the DFW Aerospace Consortium as well as new business and workforce collaborations.
- **Organizational alignment.** Fort Worth has an abundance of strong partner organizations working at different levels to improve the city's economy. These partners need a shared context for decision making, resource allocation, and collaborative implementation of strategies and actions.

NEW INITIATIVES *ARE REQUIRED TO TAKE FORT WORTH TO THE NEXT LEVEL.*

New and highly tactical initiatives include creative strategies unique to Fort Worth, designed to leverage specific assets and opportunities. Initiatives that have been considered include:

New collaboration between Alliance & downtown. Fort Worth has something no other city in the metro area can claim: a vibrant downtown district *and* a dynamic suburban growth center. Downtown Fort Worth and Alliance play distinct economic roles and offer distinct advantages for doing business. Downtown offers prime office space, urban residential options, nightlife, a high concentration of hotels, and a walkable environment connecting these uses and amenities. Alliance is the perfect location for land-intensive operations with a need for transportation access (highway, rail, and air) as well as high-speed broadband internet within a secure corporate environment.

While Downtown and Alliance rarely compete, they could more formally align their interests to mutual benefit. A large distribution or data center would not consider locating downtown. Likewise, a corporate headquarters in a downtown office tower is unlikely to locate in a far-away greenfield site. Fort Worth's advantage is that it has many companies in both locations that could expand. Downtown-based firms could open facilities (e.g., a data center) in Alliance. And companies operating in Alliance could open offices (e.g., a software development center) in Downtown.

This new collaboration should start with a formal memorandum of understanding (MOU) between Hillwood and Sundance Square to support business attraction and expansion in Fort Worth (with Near Southside, Inc. and Downtown Fort Worth, Inc. as potential partners). The recent announcement by Hillwood, of its plans to establish its primary regional office for the Hillwood Energy division and a satellite office for the Hillwood Properties and Hillwood Urban divisions in a 9,000-square foot space in Sundance Square, supports this recommendation.

Medical district/real estate task force. Fort Worth already has the single largest concentration of medical jobs in North Texas: the Near Southside medical district. The recently developed TCU-UNTHSC medical school will open up a new set of opportunities for innovation and business growth tied to the healthcare sector. The district benefits from proximity to downtown and growing urban vitality along the Magnolia Avenue corridor and South Main Street. These elements are many of the ingredients necessary to establish a medical innovation district, specifically one that can fuel economic growth citywide.

A group of leaders from the public sector, the healthcare industry, and the real estate community will be identified and convened as a Medical District Task Force. The group will be charged with laying the foundation for new investments and policies to accelerate economic growth in this district.

The creation of an "innovation district" is a potentially transformative project that will be evaluated by this task force. The role of innovation districts and their economic development potential has been documented and understood in detail thanks to the Anne T. and Robert M. Bass Initiative on Innovation and Placemaking. The Bass Initiative is a collaboration between the Brookings Institution and Project for Public Spaces to catalyze new cross-disciplinary approaches to economic development that integrate the benefits of vibrant public spaces, innovative urban economies, and inclusive growth.

Specialized innovation centers (geo-tech & transportation). The ability of highly specialized innovation centers, or "centers of excellence," to spur economic development is well-documented. SEMATECH, the non-profit research consortium focused on semiconductor innovation, played a foundational role in the 1980s in establishing Austin's early competitive advantages. The presence of the organization is credited as a major factor in the city's

emergence as one of the leading technology centers in the US. The Water Council in Milwaukee is another example of a highly-targeted innovation center focused on economic development.

Successful innovation centers rely on partnerships between higher education institutions and businesses, leveraging unique regional assets to support the advancement of research or training within a specific industry or focus area. They often serve as magnets for industry expertise and are dedicated to the success of companies within a region. Fort Worth and the surrounding metro area has a high level of industry expertise and research depth in at least two areas worth exploring as potential innovation centers: 1) geo-tech/oil & gas; and 2) transportation & logistics. These opportunities for specialized innovation centers are under evaluation as part of the planning process.

Re-thinking the citywide tax increment financing (TIF) district strategy. Fort Worth currently manages 12 TIF districts throughout the city. These districts exist to finance public improvements that generate economic development benefits for the district and for the city as a whole. Some districts have performed well, while others have seen limited success. Regardless of their individual performance, the TIF districts have operated in a "silo" environment without a broader citywide framework dictating how they fit into the overall economic development program and how they interact with each other.

An economic development bond package. Cities can support economic development through a variety of tools, many of which have been alluded to above. Beyond these programs and initiatives, the adoption of a major public bond package is among the most significant steps the City could take to advance its economic development efforts. Fort Worth does not benefit from the Type A and Type B economic development corporation status available to many of the metro area's suburban cities. Resources dedicated to economic development in cities such as Frisco and McKinney number in the tens of millions of dollars. An economic development bond package in Fort Worth is one solution to the intense regional competition for business development.

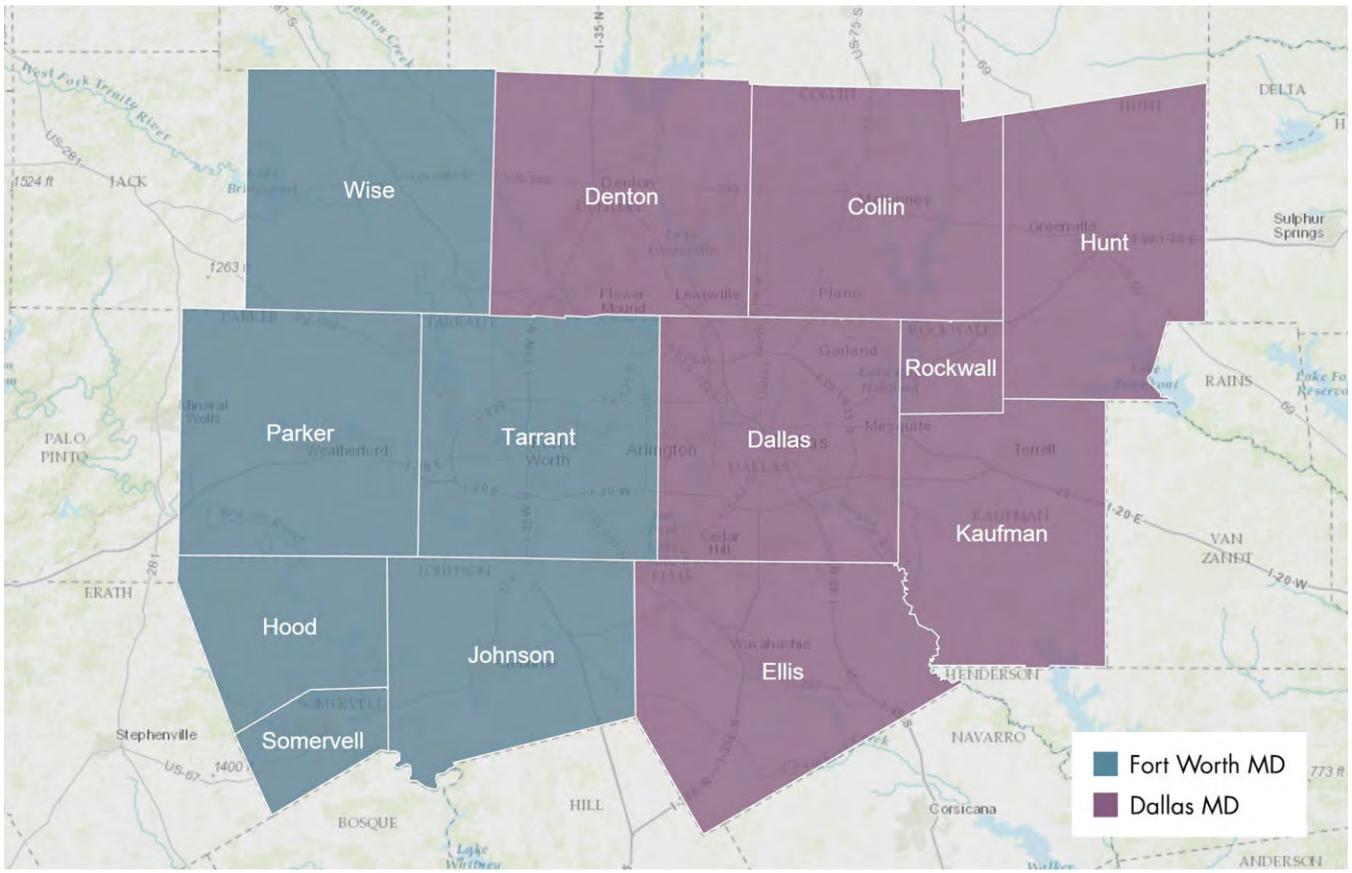
An economic development bond package would include new investments in public infrastructure, amenities, and projects that enhance the city's appeal among talent and businesses. Such a package would need to be carefully crafted to ensure broad support among residents and employers. It would also need to be fiscally sound, generating near- and long-term economic benefits for the city.

Fortunately, Fort Worth can learn from the experiences of other cities that have made similar investments. The Oklahoma City MAPS (Metropolitan Area Projects) bond program, now in its third iteration, is one of the most successful examples in the US. The MAPS investments are credited with raising the profile of Oklahoma City from a previously struggling economy to a dynamic city that has become a magnet for talent and business development. A similar bond package in Fort Worth must be considered as part of this planning process.

REFERENCE APPENDIX

1. METROPOLITAN DIVISIONS

The Dallas–Fort Worth–Arlington, TX Metropolitan Statistical Area (Dallas-Fort Worth metro area) includes two metropolitan divisions (MDs): the Fort Worth-Arlington, TX Metropolitan Division (Fort Worth MD) and the Dallas-Plano-Irving, TX Metropolitan Division (Dallas MD). To better illustrate Fort Worth's performance within the larger metropolitan area, a number of the analyses conducted as part of this work use this geographic concept.



Source: TIP Strategies (map); Office of Management and Budget, OMB Bulletin No. 15-01 (metropolitan division definitions)

ABOUT METROPOLITAN DIVISIONS

Metropolitan divisions are smaller groupings of counties or equivalent entities defined within a metropolitan statistical area containing a single core with a population of at least 2.5 million. Not all metropolitan statistical areas with a single core population of this size will contain metropolitan divisions. A metropolitan division consists of one or more main/secondary counties that represent an employment center, plus adjacent counties associated with the main/secondary county or counties through commuting ties.

2. ASSETS

AIRPORTS

PASSENGER TRENDS AT DFW INTERNATIONAL AIRPORT

Passenger enplanements at DFW International Airport have risen over the past 15 years (Figure 14), despite a series of significant setbacks including two economic downturns: the Tech Bust and then the Great Recession. Obstacles have also included the fallout from 9/11, which temporarily depressed air travel and, more specific to DFW itself, the consolidation and realignment of Delta's hub structure in the mid-2000s. Delta's withdrawal from DFW as a major hub had the effect of temporarily boosting American's market share at DFW to more than 70 percent (Figure 15). After a decade, however, DFW had diversified its carrier base to a point that America's market share once again dipped below 70 percent by 2015.

FIGURE 14. TOTAL ENPLANED PASSENGERS
DFW INTERNATIONAL AIRPORT

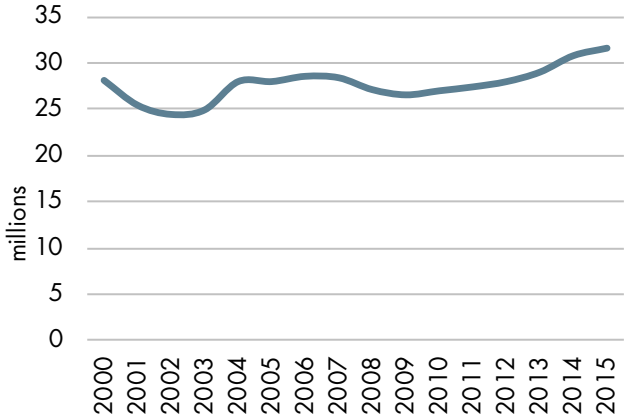
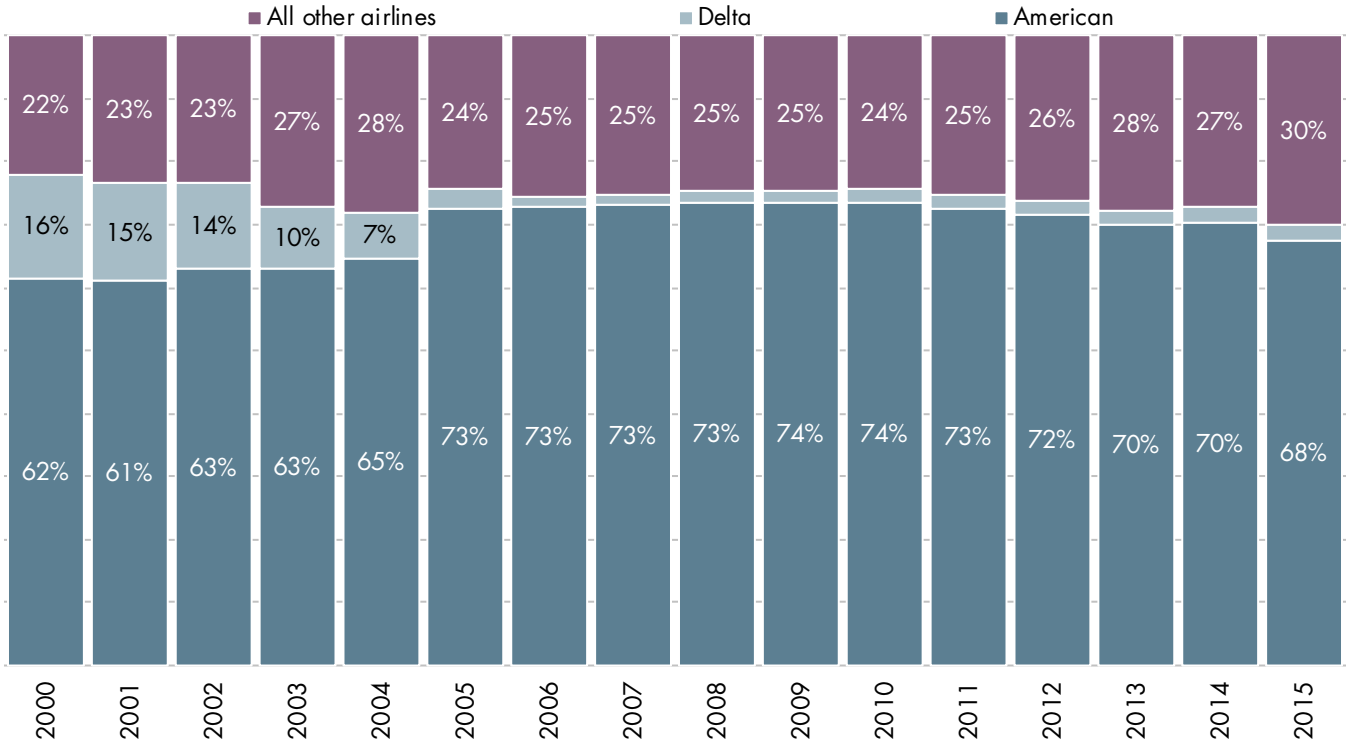


FIGURE 15. EVOLVING MARKET SHARES
DFW INTERNATIONAL AIRPORT (PERCENT OF ENPLANED PASSENGERS)



Source (both figures this page): US Bureau of Transportation Statistics.

Air traffic is often measured in airport-to-airport tallies rather than airport-to-metropolitan market traffic. The latter is more significant because it equalizes metropolitan markets served by a single, major airport (like Denver) with those markets that operate on a multi-airport structure (like New York, Los Angeles, Washington, London, and the San Francisco Bay Area). Using an airport-to-metropolitan market analysis (Figure 16), the top 25 domestic metropolitan destinations served by DFW represented 57 percent of all passengers enplaned, while the leading market, Southern California (Los Angeles), was the destination for 6 percent of all passengers enplaned.

FIGURE 16. TOP 25 DOMESTIC DESTINATIONS BY METROPOLITAN AREA
DFW INTERNATIONAL AIRPORT, TOTAL ENPLANED DOMESTIC PASSENGERS

Rank	Metropolitan Market	Airports in the Metro Region	2000		2015		2000-2015
			Passengers	% of Total	Passengers	% of Total	% Chg.
1	Los Angeles	*LAX, SNA, ONT, PSP, NTD, LGB, BUR, RIV, SBD, VCV*	1,719,094	6.1%	1,903,965	6.0%	+10.8%
2	New York/Northern NJ	*JFK, LGA, EWR, ISP, SWF, HPN*	1,026,367	3.6%	1,274,552	4.0%	+24.2%
3	Miami/South Florida	*MIA, FLL, PBI*	953,658	3.4%	1,117,699	3.5%	+17.2%
4	Chicago	*ORD, MDW*	1,066,806	3.8%	1,047,348	3.3%	-1.8%
5	Atlanta	*ATL, PDK*	1,225,436	4.4%	972,892	3.1%	-20.6%
6	Washington/Baltimore	*DCA, BWI, IAD*	891,291	3.2%	952,372	3.0%	+6.9%
7	San Francisco Bay Area	*SFO, SJC, OAK, SUU*	1,124,098	4.0%	907,683	2.9%	-19.3%
8	Denver	*DEN*	908,266	3.2%	848,704	2.7%	-6.6%
9	Houston	*IAH, HOU, EFD*	849,764	3.0%	749,890	2.4%	-11.8%
10	Phoenix	*PHX, AZA, DQF*	628,789	2.2%	684,458	2.2%	+8.9%
11	Las Vegas	*LAS, LSV*	622,607	2.2%	676,070	2.1%	+8.6%
12	Charlotte	*CLT*	273,801	1.0%	606,013	1.9%	+121.3%
13	Austin	*AUS*	607,557	2.2%	593,825	1.9%	-2.3%
14	Orlando	*MCO*	513,309	1.8%	587,203	1.9%	+14.4%
14	Seattle/Puget Sound	*SEA, BFI, TCM, PAE*	433,192	1.5%	575,102	1.8%	+32.8%
16	San Antonio	*SAT*	594,293	2.1%	561,780	1.8%	-5.5%
17	San Diego	*SAN, NKX, CLD, NZY, SDM*	495,760	1.8%	526,897	1.7%	+6.3%
18	Philadelphia	*PHL, ILG, PAS*	324,950	1.2%	513,037	1.6%	+57.9%
19	Minneapolis/St. Paul	*MSP, STP*	390,123	1.4%	508,651	1.6%	+30.4%
20	Boston	*BOS, PVD, MHT*	407,622	1.4%	461,396	1.5%	+13.2%
21	Detroit	*DTW, YIP, YQG*	328,878	1.2%	433,115	1.4%	+31.7%
22	Salt Lake City	*SLC*	358,086	1.3%	419,508	1.3%	+17.2%
23	Tampa Bay	*TPA, PIE*	359,751	1.3%	342,495	1.1%	-4.8%
24	Nashville	*BNA*	291,263	1.0%	340,446	1.1%	+16.9%
25	New Orleans	*MSY, NBG*	318,587	1.1%	337,591	1.1%	+6.0%
Passengers Enplaned in the Top 25 Domestic Markets			16,713,348	59.4%	17,942,692	56.8%	+7.4%
Total Passengers Enplaned at DFW			**28,153,721**	**100.0%**	**31,596,649**	**100.0%**	**+12.2%**

Source: US Bureau of Transportation Statistics.

The 25 leading international metropolitan destinations served by DFW represented nearly 10 percent of all passengers enplaned in 2015 (Figure 17), up from just over 7 percent in 2000. New nonstop destinations to Dubai, Hong Kong, Sydney, Doha, and Shanghai ranked among DFW's top 25 international markets in 2015, even though these were unserved nonstop markets just 15 years earlier.

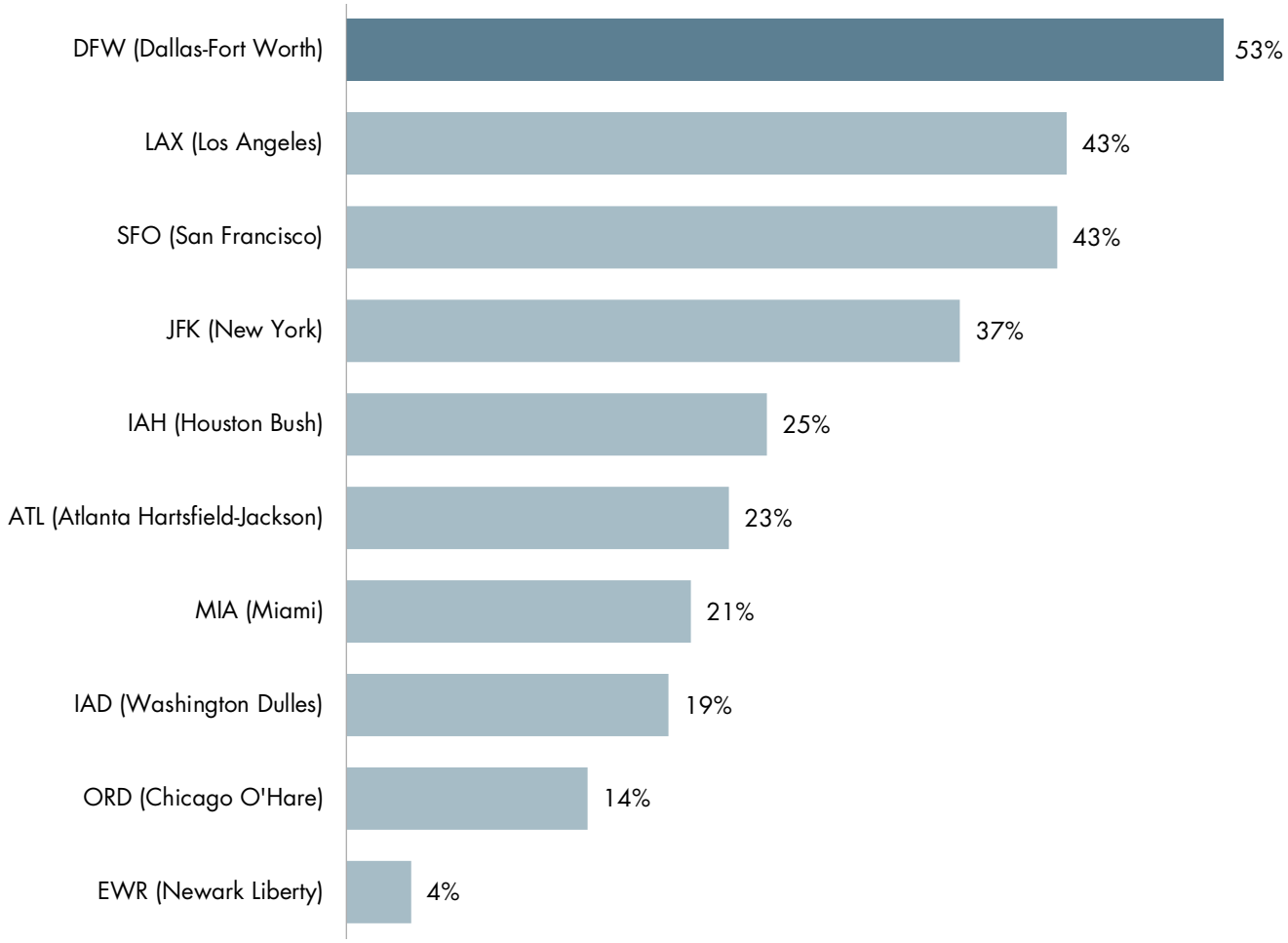
FIGURE 17. TOP 25 INTERNATIONAL DESTINATIONS BY METROPOLITAN AREA
DFW INTERNATIONAL AIRPORT, TOTAL ENPLANED INTERNATIONAL PASSENGERS

Rank	Metropolitan Market	Airports in the Metro Region	2000		2015		2000-2015
			Passengers	% of Total	Passengers	% of Total	% Chg.
1	Cancun, Mexico	*CUN*	252,842	0.9%	367,571	1.2%	+45.4%
2	London, UK	*LHR, LGW, STN*	217,964	0.8%	315,222	1.0%	+44.6%
3	Mexico City, Mexico	*MEX*	285,202	1.0%	262,050	0.8%	-8.1%
4	Toronto, Canada	*YYZ*	142,626	0.5%	151,571	0.5%	+6.3%
5	Tokyo, Japan	*NRT, HND, OKO*	108,290	0.4%	147,707	0.5%	+36.4%
6	Los Cabos, Mexico	*SJD*	58,006	0.2%	145,559	0.5%	+150.9%
7	Monterrey, Mexico	*MTY*	124,065	0.4%	126,768	0.4%	+2.2%
8	Frankfurt, Germany	*FRA, HHN*	135,068	0.5%	124,786	0.4%	-7.6%
9	Seoul, South Korea	*ICN, SEL*	20,898	0.1%	114,570	0.4%	+448.2%
10	Dubai, UAE	*DXB*	0	0.0%	114,264	0.4%	—
11	Vancouver, Canada	*YVR*	142,383	0.5%	109,747	0.3%	-22.9%
12	Puerto Vallarta, Mexico	*PVR*	50,252	0.2%	99,489	0.3%	+98.0%
13	Guadalajara, Mexico	*GDL*	94,141	0.3%	96,122	0.3%	+2.1%
14	Hong Kong, HK	*HKG*	0	0.0%	90,090	0.3%	—
14	Sydney, Australia	*SYD*	0	0.0%	87,445	0.3%	—
16	Doha, Qatar	*DOH*	0	0.0%	85,321	0.3%	—
17	Sao Paulo, Brazil	*GRU, VCP*	60,735	0.2%	82,171	0.3%	+35.3%
18	Calgary, Canada	*YYC*	92,829	0.3%	72,560	0.2%	-21.8%
19	Paris, France	*CDG, ORY*	56,897	0.2%	67,337	0.2%	+18.3%
20	Madrid, Spain	*MAD, TOJ*	3,335	0.0%	64,044	0.2%	+1820.4%
21	Santiago, Chile	*SCL*	44,010	0.2%	63,292	0.2%	+43.8%
22	Leon/Guanajuato, Mexico	*BJX*	49,850	0.2%	61,659	0.2%	+23.7%
23	Shanghai, China	*PVG*	0	0.0%	61,225	0.2%	—
24	Buenos Aires, Argentina	*EZE*	11,273	0.0%	61,203	0.2%	+442.9%
25	Cozumel, Mexico	*CZM*	44,442	0.2%	55,438	0.2%	+24.7%
Passengers Enplaned in the Top 25 International Markets			1,995,108	7.1%	3,027,211	9.6%	+51.7%
Total Passengers Enplaned at DFW			**28,153,721**	**100.0%**	**31,596,649**	**100.0%**	**+12.2%**

Source: US Bureau of Transportation Statistics.

DFW International Airport's effort to recruit new carriers and new international destinations in recent years shows signs of success. In the six-year period from 2010 to 2016, international passenger traffic rose by more than 50 percent (Figure 18), a threshold unmatched by other major international US airports, and a rate of growth more than double that experienced by Houston Bush Intercontinental Airport (IAH) during the same period. This growth in international passenger traffic is significant, because DFW represents the metro area's gateway to the global economy. For many foreign visitors, the airport will be their first impression of Dallas-Fort Worth metropolitan area. Ample international destinations and growing passenger traffic reinforces the metro area's global accessibility and, more subtly, it boosts the metro area's name recognition through airport marquees around the world, 24 hours a day, 7 days a week. The potential for a major international airport to serve as an economic development tool cannot be underestimated.

FIGURE 18. PERCENT GROWTH IN AVERAGE MONTHLY INTERNATIONAL PASSENGERS
AMONG 10 BUSIEST US AIRPORTS, 2010-2016*

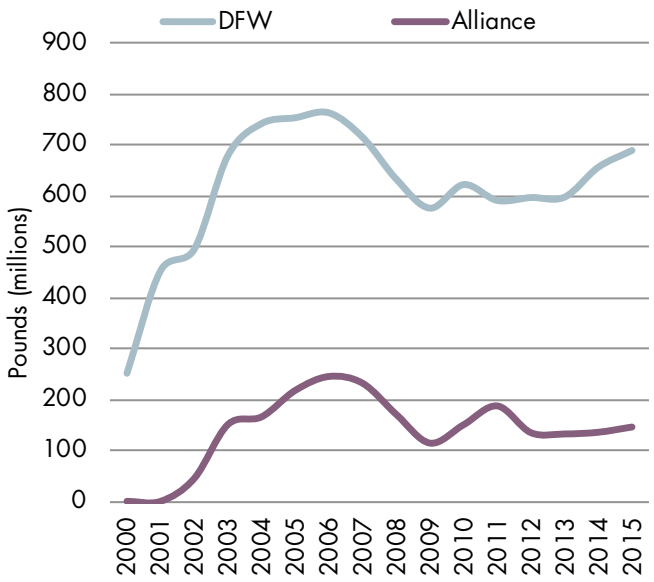


*2016 data is through November.
Source: US Department of Transportation, Bureau of Transportation Statistics.

AIR FREIGHT TRENDS AND PATTERNS AT DFW AND ALLIANCE

Air freight, as measured by cargo weight, grew rapidly in the pre-recession years, but was hit hard by the Great Recession, and still has not recovered to pre-recession levels. This persistent pattern has been seen across many US airports, with DFW and Alliance being no exceptions (Figure 19). There are many explanations—more structural in nature than cyclical—that may feed into this trend. These explanations include, but are not limited to, the internet's impact on mail deliveries, the rationalization of logistics operations, and more consumer choices for delivery costs versus delivery speed.

FIGURE 19. AIR FREIGHT ENPLANED



The US Bureau of Transportation Statistics (BTS) reports air traffic based on weight rather than cargo value. This is important to note because it can skew analysis to the point of being misleading: a bag of mail may weigh the same as a crate of pharmaceuticals or medical devices but have a vastly different value. The business incentive is to restrict freight shipping by air to include only high-value, low-weight cargos. With that caveat in mind, FedEx was the dominant carrier at Alliance based on cargo weight, with a 95 percent market share of outbound cargo as of 2015 (Figure 21). UPS was the dominant carrier at DFW with a 26 percent market share of outbound cargo as of 2015 (Figure 20).

Again, based on cargo *weight alone*, DFW International Airport carries more than four times the freight volume of Alliance. Twelve of DFW's top 25 freight destinations are international (Figure 22). Alliance's leading destinations are all domestic with more than 40 percent of enplaned cargo headed to either greater Los Angeles or Chicago (Figure 23).

FIGURE 20. MARKET SHARE LEADER AT DFW

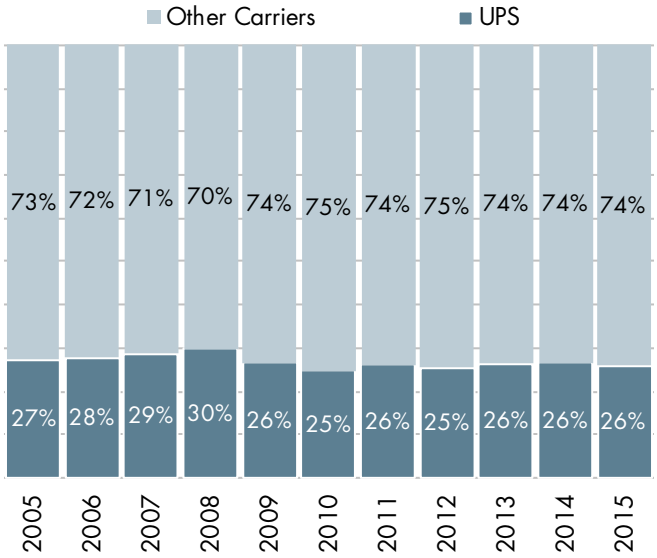
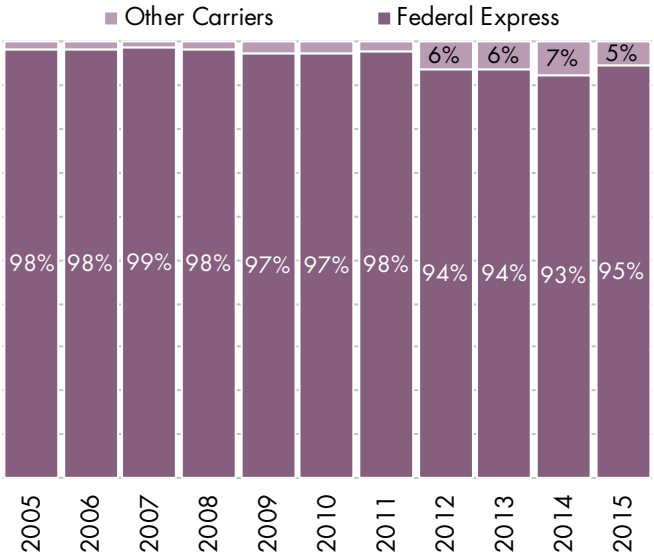


FIGURE 21. MARKET SHARE LEADER AT ALLIANCE



Source (all figures this page): US Bureau of Transportation Statistics. Note: Labels for values below 5% have been omitted for visual clarity.

FIGURE 22. TOP 25 FREIGHT DESTINATIONS FROM DFW

Rank	Metropolitan Market	Airports in the Metro Region	2005		2015		2005-2015
			Pounds (mil)	% of Total	Pounds (mil)	% of Total	% Chg.
1	Louisville, KY	*SDF*	66.3	8.8%	99.5	14.4%	+50.0%
2	Memphis, TN	*MEM*	92.7	12.3%	84.5	12.3%	-8.8%
3	Taipei, Taiwan	*TPE*	66.0	8.8%	62.3	9.0%	-5.6%
4	Seoul, South Korea	*ICN, SEL*	40.9	5.4%	61.9	9.0%	+51.4%
5	Indianapolis, IN	*IND*	40.5	5.4%	30.2	4.4%	-25.4%
6	Frankfurt, Germany	*FRA, HHN*	28.1	3.7%	26.9	3.9%	-4.0%
7	London, UK	*LHR, LGW, STN*	30.4	4.0%	24.9	3.6%	-18.1%
8	Hong Kong, Hong Kong	*HKG*	1.8	0.2%	21.3	3.1%	+1053.3%
9	Tokyo, Japan	*NRT, HND, OKO*	12.8	1.7%	21.1	3.1%	+64.8%
10	Los Angeles, CA	*ONT, LAX, LGB, SNA, PSP, NTD, BUR, RIV, VCV*	41.0	5.4%	20.1	2.9%	-51.1%
11	New York/Northern New Jersey	*EWR, LGA, JFK*	31.1	4.1%	17.7	2.6%	-43.0%
12	Amsterdam, Netherlands	*AMS*	1.3	0.2%	14.6	2.1%	+982.8%
13	Cincinnati, OH	*CVG*	0.4	0.1%	14.4	2.1%	+3130.8%
14	Rockford, IL	*RFD*	12.5	1.7%	12.5	1.8%	+0.5%
14	San Francisco Bay Area	*SJC. SFP. OAK, SUU*	12.4	1.6%	11.0	1.6%	-11.5%
16	Miami/South Florida	*MIA, FLL, PBI*	12.7	1.7%	10.9	1.6%	-13.9%
17	Shanghai, China	*PVG*	11.6	1.5%	10.8	1.6%	-7.1%
18	Brussels, Belgium	*BRU*	17.3	2.3%	10.6	1.5%	-38.8%
19	Luxembourg, Luxembourg	*LUX*	0.0	0.0%	9.9	1.4%	—
20	Albuquerque, NM	*ABQ*	9.0	1.2%	9.5	1.4%	+6.3%
21	Singapore, Singapore	*SIN*	4.1	0.5%	9.2	1.3%	+124.3%
22	Spokane, WA	*GEG*	8.2	1.1%	9.1	1.3%	+11.2%
23	Orlando, FL	*MCO*	11.8	1.6%	8.3	1.2%	-29.9%
24	Doha, Qatar	*DOH*	0.0	0.0%	7.8	1.1%	—
25	Boston, MA	*BOS, PVD, MHT*	0.8	0.1%	7.3	1.1%	+866.4%
Air Freight for the Top 25 Markets			553.7	73.4%	616.4	89.4%	+11.3%
Total Air Freight Enplaned at DFW			**753.9**	**100.0%**	**689.7**	**100.0%**	**-8.5%**

Source: US Bureau of Transportation Statistics.

FIGURE 23. TOP 25 FREIGHT DESTINATIONS FROM ALLIANCE

Rank	Metropolitan Market	Airports in the Metro Region	2005		2015		2005-2015
			Pounds (mil)	% of Total	Pounds (mil)	% of Total	% Chg.
1	Los Angeles, CA	*LAX, LGB, ONT, BUR, SNA*	55.6	25.6%	30.4	20.9%	-45.3%
2	Chicago, IL	*ORD, MDW*	11.4	5.3%	29.5	20.3%	+158.2%
3	Houston, TX	*IAH*	12.8	5.9%	17.0	11.7%	+32.3%
4	San Francisco Bay Area	*OAK, SJC, SFO*	35.1	16.1%	10.4	7.1%	-70.4%
5	San Antonio, TX	*SAT*	7.6	3.5%	9.3	6.4%	+21.7%
6	Denver, CO	*DEN*	0.1	0.1%	7.5	5.2%	+6703.1%
7	El Paso, TX	*ELP*	0.0	0.0%	6.4	4.4%	—
8	Seattle, WA	*SEA*	4.5	2.1%	5.1	3.5%	+13.6%
9	Portland, OR	*PDX*	0.0	0.0%	5.0	3.5%	—
10	Tulsa, OK	*TUL*	1.3	0.6%	4.0	2.8%	+211.1%
11	Lubbock, TX	*LBB*	3.5	1.6%	3.5	2.4%	-2.7%
12	New Orleans, LA	*MSY*	0.2	0.1%	3.0	2.1%	+1568.8%
13	Shreveport, LA	*SHV*	5.8	2.7%	2.9	2.0%	-50.1%
14	Wichita, KS	*ICT, HUT*	3.1	1.4%	2.8	1.9%	-8.2%
14	Midland/Odessa, TX	*MAF, VWH*	0.5	0.2%	2.3	1.6%	+340.8%
16	Laredo, TX	*LRD*	0.0	0.0%	1.0	0.7%	—
17	Austin, TX	*AUS*	0.9	0.4%	0.9	0.6%	-0.6%
18	Salt Lake City, UT	*SLC*	0.0	0.0%	0.9	0.6%	—
19	Phoenix, AZ	*PHX*	0.0	0.0%	0.7	0.5%	—
20	Miami/South Florida	*FLL, MIA*	37.5	17.3%	0.7	0.5%	-98.2%
21	Memphis, TN	*MEM*	0.1	0.1%	0.5	0.4%	+278.1%
22	Kansas City, MO	*MCI*	0.8	0.4%	0.4	0.3%	-46.6%
23	Minneapolis, MN	*MSP*	8.4	3.9%	0.2	0.2%	-97.3%
24	Indianapolis, IN	*IND*	0.0	0.0%	0.2	0.1%	—
25	Oklahoma City, OK	*OKC*	0.0	0.0%	0.1	0.1%	—
Air Freight for the Top 25 Markets			189.3	87.2%	144.8	99.6%	-23.5%
Total Air Freight Enplaned at Alliance			**217.1**	**100.0%**	**145.4**	**100.0%**	**-33.0%**

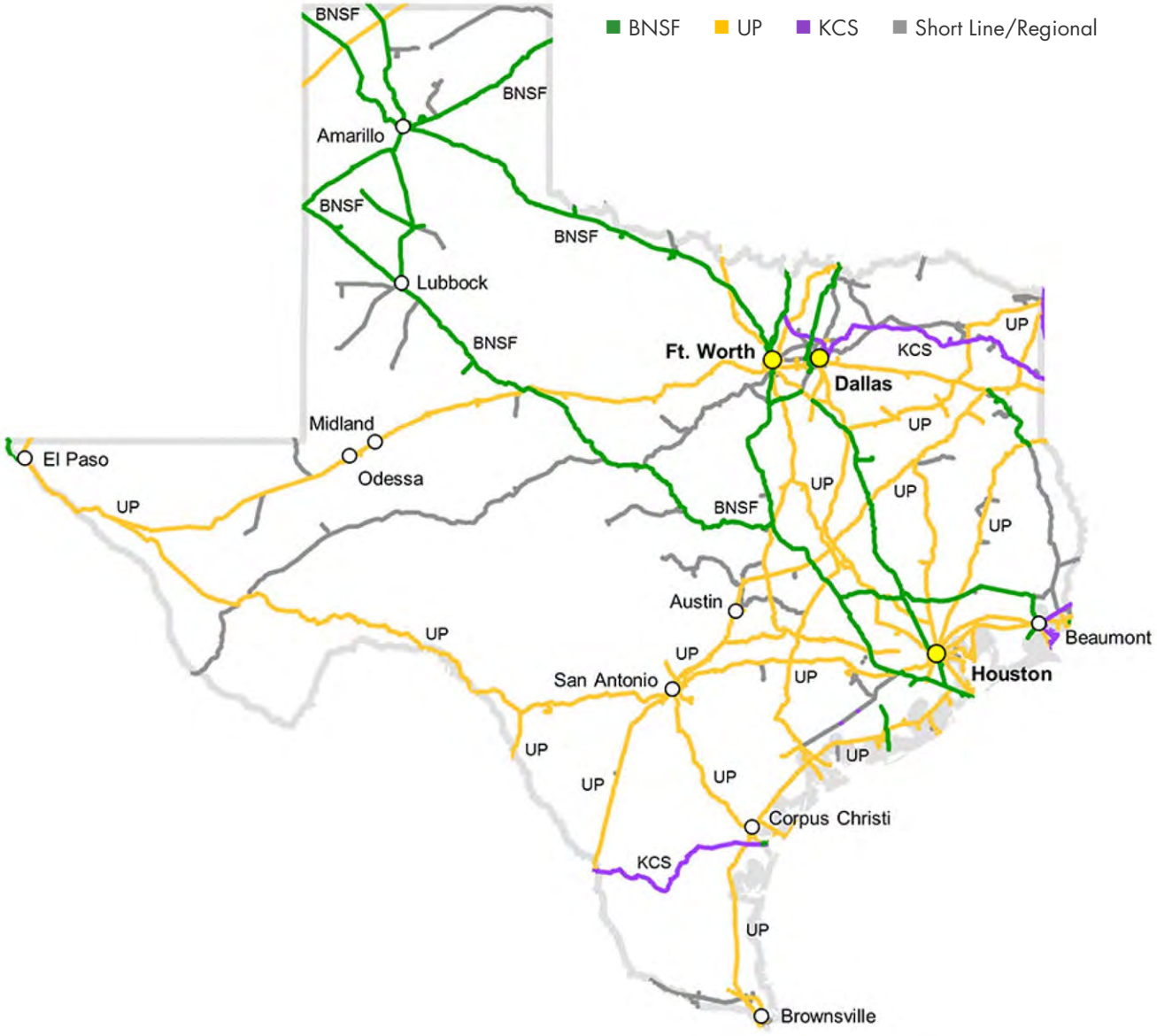
Source: US Bureau of Transportation Statistics.

FREIGHT RAILROADS IN DALLAS-FORT WORTH

Seven Class I railroads serve the United States. Three of these—Union Pacific, BNSF, and KCS—are active in Texas, and all three serve the Dallas-Fort Worth metropolitan area (Figure 24). The tracks of Omaha-based Union Pacific and locally based BNSF crisscross the city of Fort Worth, with a critical intersection at the Tower 55 rail yard on the south side of downtown.

The intermodal connections of Class I railroads represent a much-desired infrastructure that is in limited supply nationwide. By this measure, the city of Fort Worth has a competitive advantage that other cities sometimes lack and cannot replicate. Union Pacific enters the city from six directions and BNSF from three. The Tower 55 rail yard in Fort Worth is considered by many to be one of the most important rail junctures in North America.

FIGURE 24. CLASS I & SHORT LINE/REGIONAL RAILROADS SERVING TEXAS



Source: Association of American Railroads.

MAJOR EMPLOYERS IN THE CITY OF FORT WORTH

Only 4 of the city's 10 largest employers in 2016 (Figure 25) were profit-seeking, private-sector entities (AMR, Lockheed, Alcon, and Bell Helicopter). The remaining six employers were governmental entities (Fort Worth ISD, NAS Joint Reserve Base Fort Worth, City of Fort Worth, and Tarrant County College) or as nonprofit health networks (JPS and Cook Children's). Together, these 10 employers provided the city with nearly 96,000 jobs in 2016.

Four of the city's largest employers cut heavily across the aviation sector in one way or another. In addition to two aircraft manufacturers (Lockheed Martin and Bell Helicopter Textron), the city's top employer is American Airlines, and its fifth largest employer is the local air base NAS Joint Reserve Base Fort Worth. These 4 employers provide aviation-related employment to nearly 54,000 workers in Fort Worth.

FIGURE 25. TOP 10 EMPLOYERS IN THE CITY OF FORT WORTH
OVERVIEW OF CHANGES FROM 2007 TO 2016

2007		
Employer	**Industry**	**Employment**
AMR/American Airlines	*Airline*	25,000
Lockheed Martin	*Aerospace*	14,400
Fort Worth ISD	*Education*	10,041
City of Fort Worth	*Local government*	6,247
Wal-Mart	*Retail*	6,079
Bell Helicopter Textron	*Aerospace*	6,004
JPMorgan Chase	*Financial services*	4,200
Tarrant County	*Local government*	4,173
JPS Health Network	*Healthcare*	3,898
Albertsons	*Retail*	3,800
Top 10 employers		**83,842**

2016		
Employer	**Industry**	**Employment**
AMR/American Airlines	*Airline*	25,000
Lockheed Martin	*Aerospace*	13,690
Fort Worth ISD	*Education*	12,000
NAS - Fort Worth - JRB	*Military*	10,000
JPS Health Network	*Healthcare*	6,500
City of Fort Worth	*Local government*	6,161
Cook Children's Health Care System	*Healthcare*	6,042
Tarrant County College	*Education*	5,999
Alcon Laboratories Inc.	*Pharmaceuticals*	5,393
Bell Helicopter Textron	*Aerospace*	4,953
Top 10 employers		**95,738**

Sources: Fort Worth Chamber of Commerce (2016); Fort Worth Star-Telegram (2007); and City of Fort Worth, Comprehensive Annual Financial Report, FY 2016, pp. 236.

CHARITABLE FOUNDATIONS

Data from the Foundation Center were assembled for 61 Fort Worth ZIP codes. Of the 272 foundations identified within the city of Fort Worth, 50 percent were located in two ZIP codes: 76102 and 76107.

The 25 largest foundations (based on total assets) control more than $5.5 billion. With nearly $2.4 billion in assets, the Kimbell Art Foundation accounts for 43 percent of that figure. However, because foundations are listed individually in the data source, the overall impact of the city's major donors, most notably the Bass family, is obscured.

FIGURE 26. TOP 25 FOUNDATIONS IN FORT WORTH
RANKED BY TOTAL ASSETS

Rank	Foundation	Total Assets *(in millions)*
1	Kimbell Art Foundation	$2,392.5
2	Carter Foundation, Amon G.	$571.3
3	Richardson Foundation, Sid W.	$564.1
4	Rainwater Charitable Foundation	$513.6
5	Burnett Foundation, The	$289.1
6	Community Foundation of North Texas	$217.6
7	Morris Foundation, The	$165.2
8	Kleinheinz Family Endowment for the Arts	$128.8
9	Justin Foundation, Jane and John	$119.2
10	Bass Foundation, Anne T. & Robert M.*	$83.6
11	Bass Foundation, Lee and Ramona*	$55.0
12	Bass Charitable Corporation, The*	$48.9
13	Once Upon A Time Foundation	$42.2
14	Miles Foundation, Inc., The	$38.9
15	Brown and C. A. Lupton Foundation, Inc., T. J.	$37.0
16	Lard Trust, Mary Potishman	$35.9
17	Carter Star-Telegram Employees Fund, Amon G.	$34.0
18	Philecology Foundation, The	$32.6
19	Psalm 25:10 Foundation, The	$32.3
20	Bratten Foundation, Meta Alice Keith	$27.7
21	Armstrong Foundation, The	$22.4
22	Doss Foundation, Inc., James & Dorothy	$21.0
23	Fischer Foundation, Jill and Charles	$20.2
24	Scott Foundation, William E.	$19.9
25	Bass Foundation*	$19.2

Source: Foundation Directory Online, compiled by the Foundation Center (foundationcenter.org).
Note: Data in Foundation Directory Online is compiled from a variety of sources, including IRS Forms 990 and 990-PF, organization websites, annual reports, and traditional and social media. Content is updated on an ongoing basis, so no date of publication is available.

3. SWOT

In addition to the key findings, TIP conducted an extensive analysis of Fort Worth's economic strengths, weaknesses, opportunities, and threats. This SWOT analysis is based on a variety of qualitative and quantitative sources, including stakeholder input from roundtable discussions, interviews, and online surveys; data analysis of demographic and economic trends; and observations informed by the consulting team's economic development expertise and national perspective. The SWOT can be defined as follows:

- **STRENGTHS.** Assets and resources that can be built on to grow, strengthen, and diversify the local economy.
- **WEAKNESSES.** Liabilities and barriers to economic development that could limit the city's growth potential.
- **OPPORTUNITIES.** Competitive advantages and positive trends that hold significant potential for the attraction of new businesses, investments, and skilled workers.
- **THREATS.** Unfavorable factors and trends (often external) that could negatively impact the local economy.

STRENGTHS

- Fastest-growing city population among 20 largest US cities from 2000 to 2016
- Highest level of absolute population and job growth from 2015 to 2016 among all US metro areas
- Strong domestic in-migration to the Dallas-Fort Worth metro area from major metros across US (especially Chicago, New York, and Los Angeles) and positive net migration to the Fort Worth MD from the Dallas MD
- Highly regarded "business friendly environment" at the local, regional, and state levels
- DFW International Airport
- Alliance Airport and related infrastructure and businesses
- Meacham Airport and Spinks Airport provide valuable general aviation and corporate air travel options
- Comprehensive network of Class I freight rail infrastructure (BNSF, UP, KCS) in Fort Worth with connections throughout Texas and the nation
- Comprehensive highway network within Fort Worth and providing national connectivity through IH-35, IH-20, and IH-30
- Much more vacant developable land (70,000+ acres in the Fort Worth city limits) than any other DFW city
- Diverse real estate options and districts (e.g., Alliance, Sundance Square, Near Southside)
- Wide menu of visitor attractions (Stockyards, Cultural District and museums, Sundance Square, Texas Motor Speedway, Fort Worth Botanic Garden, Fort Worth Zoo)
- Increasingly vibrant urban core centered on downtown, including surrounding urban districts and corridors
- Strong and diverse industry clusters (transportation & logistics, aerospace manufacturing, healthcare, oil & gas, tourism)
- Increasingly diverse commercial tax base (top 10 city taxpayers accounted for 6.1 percent of city's property assessments in 2007, compared to only 4.5 percent in 2016)
- Diverse population in Fort Worth makes the community appealing to a broad range of racial/ethnic groups from within and outside the metro area
- Large network of higher education institutions in the city (TCU, Texas Wesleyan, TCC, Texas A&M School of Law, UT-A Fort Worth Campus, TCC, Tarleton State, Southwestern Baptist Theological Seminary, and UNTHSC) and the region (UT-A and UNT)
- Strong group of partner organizations involved in economic development, led by the City Economic Development Department and the Fort Worth Chamber

WEAKNESSES

- Employment growth lagging residential growth in Fort Worth
- Low level and low growth rate of high-wage professional jobs in the Fort Worth side of the Dallas-Fort Worth metro area compared to the Dallas side
- Fort Worth struggles with low levels of external visibility and name recognition nationally, especially compared to Dallas
- Residential uses (especially single-family housing) dominate the tax base and recent growth trends
- No large universities in Fort Worth and no Tier One research universities in Dallas-Fort Worth metro area
- Limited networking opportunities available for entrepreneurs, tech workers and young professionals
- Under-developed hotel supply in Fort Worth relative to the rest of Tarrant County and the metro area
- Lower income levels and educational attainment levels in Fort Worth compared to benchmark communities
- Under-performing K-12 schools compared to suburban school districts in the Dallas-Fort Worth metro area
- Workforce challenges faced by many employers and industries, especially in low- and middle-skill occupations
- Lack of a strategic framework for economic development

OPPORTUNITIES

- Pursue innovation centers or "centers of excellence" linking industry and research expertise to drive economic development associated with specific opportunities (e.g., geo-tech/oil & gas, transportation & logistics)
- Leverage UTA's ongoing push to become a more research-focused university
- Create closer connections between multi-generational family wealth and startup and entrepreneurship opportunities to accelerate new business activity
- Seek out new international business opportunities in light of increased international passengers/connections at DFW International Airport
- Strategically promote Fort Worth's transportation infrastructure advantages (three of the nation's seven Class I railroads) to attract transportation-dependent industries
- Build new partnerships between employers and workforce/education providers to promote workforce development and support talent recruitment initiatives
- Increase the supply of hotel rooms in Fort Worth (especially in downtown) to meet excess demand for hotel rooms
- Maximize the development potential of major districts at different stages of their life, including: mature districts (Downtown Fort Worth/Sundance Square, Stockyards, Cultural District), established/emerging districts (Alliance, Near Southside medical district), and long-term plays (Panther Island, Walsh Ranch)
- Explore the ability of a second tier of target areas to support new commercial and residential development (Evans & Rosedale, Stop Six, West Camp Bowie, Altamesa & McCart, Near Northside, and East Lancaster)
- Increasing development and business attraction opportunities in the city's urban core (centered on Downtown and the Near Southside) resulting from national and regional growth trends
- Encourage corridor development to better link Downtown with surrounding urban districts
- Increase the supply of co-working spaces to serve the city's growing startups, entrepreneurs, and freelancers
- Leverage the Anne T. and Robert M. Bass Initiative on Innovation and Placemaking to catalyze the development of an "innovation district" in the Near Southside medical district

THREATS

- Growing imbalance of residential versus employment growth strains the local tax base
- Fort Worth, especially outside Texas, is perceived as less inviting to diverse groups (racial/ethnic minorities, young adults, international migrants) than other cities, including negative views related to the city's image as "Cowtown" and a "country club" environment
- Job growth in the Dallas side (Dallas MD) of the metro area has outpaced job growth in the Fort Worth side (Fort Worth MD) since 2010, especially job growth in high-wage professional occupations
- Construction of new office space within the DFW area is highly concentrated in the Far North Dallas submarket, which accounts for more than half of all new office space currently under construction (about 6.5 million square feet), compared with less than 1 million square feet of new space currently under construction in the Fort Worth area submarkets
- City's vast land area and vacant properties are a "double-edged sword" that makes it difficult to concentrate development in targeted geographic areas because there is room to grow in nearly every direction
- Intense intra-regional competition for business recruitment and expansion projects tends to obscure opportunities that might be found outside the region

4. DEMOGRAPHICS

The Dallas-Fort Worth metropolitan area has experienced consistently strong population and economic growth in the post-WWII decades, a dynamic that has propelled it into a major intercontinental hub of trade and traffic. Recently, the metro area has been home to two of the nation's fastest-growing cities (in percentage terms): Frisco and McKinney (Figure 27). The metro area also boasts many of Texas's largest cities. Of the 59 cities in the state with an estimated population of 50,000 or more in 2016, 20 were in the Dallas-Fort Worth MSA. The city of Fort Worth has also experienced strong population growth since the last census, ranking 50th out of the 715 US cities in this group, with an increase of 14.7 percent. Along with Frisco and McKinney, Denton was the only other Dallas-Fort Worth metro area city to surpass Fort Worth in percentage growth during the period. When viewed in numeric (rather than percentage) gains, Texas's largest cities (Houston, San Antonio, Austin, Dallas, and Fort Worth) accounted for five of the top 10 spots nationally, with each adding more than 100,000 residents since the 2010 Census (Figure 28).

FIGURE 27. POPULATION CHANGE FOR TEXAS CITIES WITH POPULATIONS OF 50,000 OR MORE, APRIL 1, 2010 TO JULY 1, 2016

TEXAS CITIES LISTED BY NATIONAL GROWTH RANK FOR THE PERIOD

US Rank (% chg)	City	Metro Area	Population Estimate		Change, 2010-2016	
			April 1, 2010	July 1, 2016	Number	Percent
1 ●	Frisco	Dallas-Fort Worth-Arlington	117,062	163,656	46,594	39.8
3	Cedar Park	Austin-Round Rock	51,731	68,918	17,187	33.2
4 ●	McKinney	Dallas-Fort Worth-Arlington	131,055	172,298	41,243	31.5
5	New Braunfels	San Antonio-New Braunfels	57,729	73,959	16,230	28.1
7	Conroe	Houston-The Woodlands-Sugar Land	64,930	82,286	17,356	26.7
8	Pearland	Houston-The Woodlands-Sugar Land	89,910	113,570	23,660	26.3
13	League City	Houston-The Woodlands-Sugar Land	83,563	102,010	18,447	22.1
14	Midland	Midland	111,196	134,610	23,414	21.1
16	Round Rock	Austin-Round Rock	100,001	120,892	20,891	20.9
21	College Station	College Station-Bryan	94,221	112,141	17,920	19.0
26	Odessa	Odessa	99,876	117,871	17,995	18.0
27	Allen	Dallas-Fort Worth-Arlington	84,275	99,179	14,904	17.7
30	Austin	Austin-Round Rock	811,045	947,890	136,845	16.9
34	Mansfield	Dallas-Fort Worth-Arlington	56,358	65,631	9,273	16.5
45 ●	Denton	Dallas-Fort Worth-Arlington	116,291	133,808	17,517	15.1
49	Edinburg	McAllen-Edinburg-Mission	76,367	87,650	11,283	14.8
50	**Fort Worth**	**Dallas-Fort Worth-Arlington**	**744,973**	**854,113**	**109,140**	**14.7**
54 ●	Richardson	Dallas-Fort Worth-Arlington	99,228	113,347	14,119	14.2
67	Flower Mound	Dallas-Fort Worth-Arlington	64,678	73,547	8,869	13.7
88	San Antonio	San Antonio-New Braunfels	1,327,538	1,492,510	164,972	12.4
94	Sugar Land	Houston-The Woodlands-Sugar Land	78,595	88,177	9,582	12.2
96	Killeen	Killeen-Temple	127,913	143,400	15,487	12.1
100 ●	Carrollton	Dallas-Fort Worth-Arlington	119,093	133,351	14,258	12.0
109	Missouri City	Houston-The Woodlands-Sugar Land	66,824	74,561	7,737	11.6
123	Temple	Killeen-Temple	66,275	73,600	7,325	11.1
142	Rowlett	Dallas-Fort Worth-Arlington	56,242	61,999	5,757	10.2
143	North Richland Hills	Dallas-Fort Worth-Arlington	63,343	69,798	6,455	10.2
144 ●	Irving	Dallas-Fort Worth-Arlington	216,285	238,289	22,004	10.2
151 ●	Plano	Dallas-Fort Worth-Arlington	259,857	286,057	26,200	10.1
153 ●	Dallas	Dallas-Fort Worth-Arlington	1,197,824	1,317,929	120,105	10.0
154	Lubbock	Lubbock	229,495	252,506	23,011	10.0

continued, next page

FIGURE 27. POPULATION CHANGE FOR TEXAS CITIES WITH POPULATIONS OF 50,000 OR MORE, APRIL 1, 2010 TO JULY 1, 2016

TEXAS CITIES LISTED BY NATIONAL GROWTH RANK FOR THE PERIOD

US Rank (% chg)		City	Metro Area	Population Estimate		Change, 2010-2016	
160		Pharr	McAllen-Edinburg-Mission	70,467	77,320	6,853	9.7
161	●	Lewisville	Dallas-Fort Worth-Arlington	95,387	104,659	9,272	9.7
162		Houston	Houston-The Woodlands-Sugar Land	2,100,277	2,303,482	203,205	9.7
175		Bryan	College Station-Bryan	76,227	83,260	7,033	9.2
181		McAllen	McAllen-Edinburg-Mission	130,463	142,212	11,749	9.0
186		Laredo	Laredo	236,057	257,156	21,099	8.9
201	●	Grand Prairie	Dallas-Fort Worth-Arlington	175,484	190,682	15,198	8.7
221		Tyler	Tyler	96,887	104,798	7,911	8.2
226		Victoria	Victoria	62,614	67,670	5,056	8.1
228		San Angelo	San Angelo	93,227	100,702	7,475	8.0
241		Waco	Waco	124,810	134,432	9,622	7.7
247		Mission	McAllen-Edinburg-Mission	77,667	83,563	5,896	7.6
252	●	Arlington	Dallas-Fort Worth-Arlington	365,399	392,772	27,373	7.5
281		Euless	Dallas-Fort Worth-Arlington	51,280	54,769	3,489	6.8
287		Corpus Christi	Corpus Christi	305,269	325,733	20,464	6.7
314		Baytown	Houston-The Woodlands-Sugar Land	71,709	75,992	4,283	6.0
333		El Paso	El Paso	648,054	683,080	35,026	5.4
360		Brownsville	Brownsville-Harlingen	175,030	183,823	8,793	5.0
382		Amarillo	Amarillo	190,666	199,582	8,916	4.7
419		Abilene	Abilene	117,463	122,225	4,762	4.1
441	●	Garland	Dallas-Fort Worth-Arlington	226,861	234,943	8,082	3.6
472	●	Mesquite	Dallas-Fort Worth-Arlington	139,518	143,736	4,218	3.0
492		Pasadena	Houston-The Woodlands-Sugar Land	149,285	153,351	4,066	2.7
526		Longview	Longview	80,425	82,055	1,630	2.0
531		Port Arthur	Beaumont-Port Arthur	54,376	55,427	1,051	1.9
581		Harlingen	Brownsville-Harlingen	64,908	65,539	631	1.0
585		Beaumont	Beaumont-Port Arthur	117,265	118,299	1,034	0.9
627		Wichita Falls	Wichita Falls	104,724	104,724	—	—

● Indicates DFW peer community.

Sources: US Census Bureau, Population Division; TIP Strategies.

FIGURE 28. US CITIES WITH THE LARGEST NUMERIC POPULATION CHANGE, APRIL 1, 2010 TO JULY 1, 2016

CITIES RANKED BY NUMERIC CHANGE

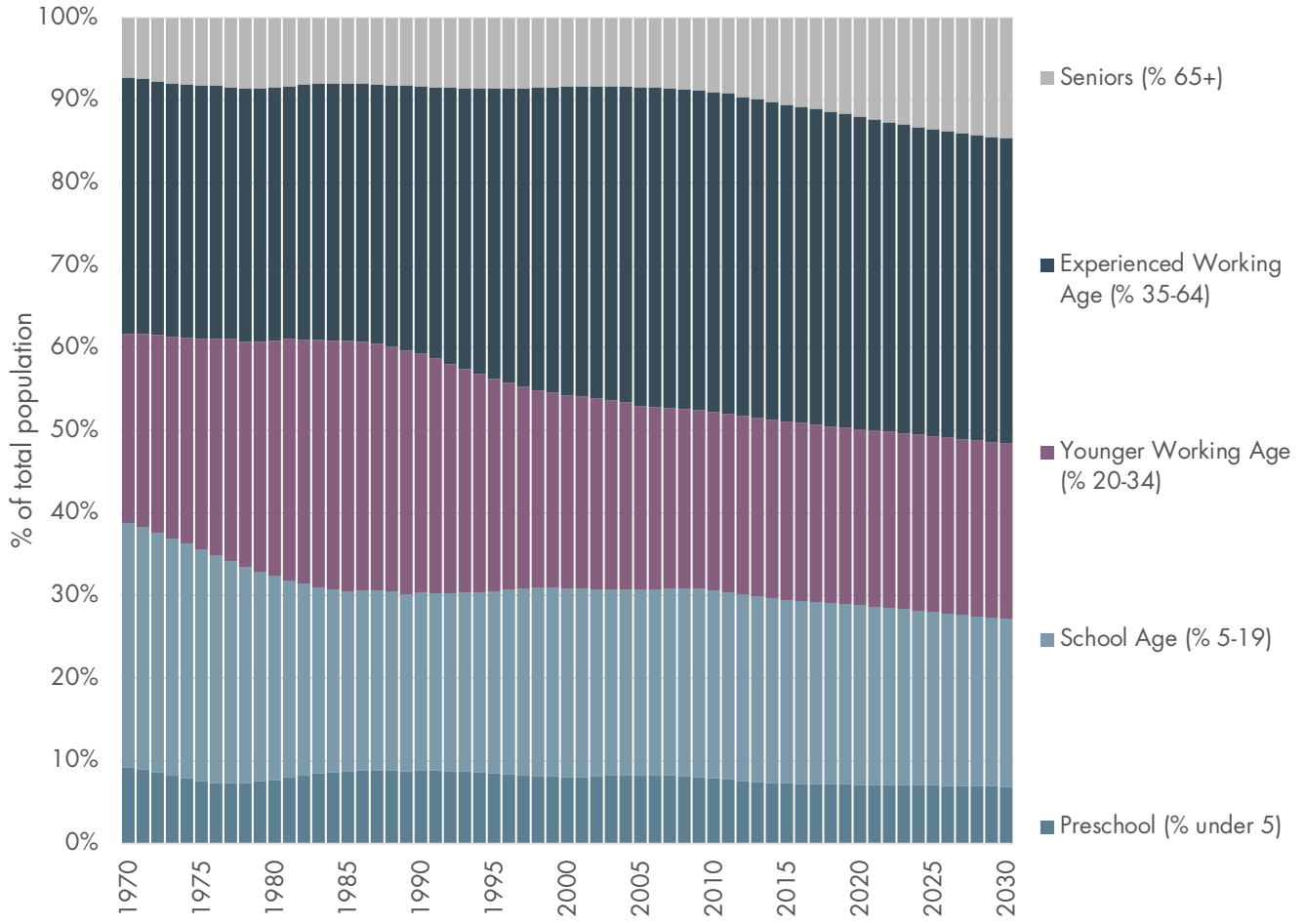
US Rank (# chg)	City	Population Estimate		Change, 2010-2016	
		April 1, 2010	July 1, 2016	Number	Percent
1	New York, New York	8,174,962	8,537,673	362,711	4.4
2	Houston, Texas	2,100,277	2,303,482	203,205	9.7
3	Los Angeles, California	3,792,584	3,976,322	183,738	4.8
4	Phoenix, Arizona	1,447,624	1,615,017	167,393	11.6
5	San Antonio, Texas	1,327,538	1,492,510	164,972	12.4
6	Austin, Texas	811,045	947,890	136,845	16.9
7	Dallas, Texas	1,197,824	1,317,929	120,105	10.0
8	**Fort Worth, Texas**	**744,973**	**854,113**	**109,140**	**14.7**
9	Charlotte, North Carolina	735,612	842,051	106,439	14.5
10	San Diego, California	1,301,722	1,406,630	104,908	8.1

Sources: US Census Bureau, Population Division; TIP Strategies.

The age structure of the US population has changed over recent decades, with a "bubble" of baby boomers passing through various age cohorts and now entering retirement. Those same dramatic patterns are less apparent in Tarrant County's age structure. Rapid growth within the county has kept the local age cohort structure relatively stable, though hints of the national patterns can be seen in Figure 29.

According to estimates by Moody's Analytics, the senior share of the county's population (age 65 or older) will begin to creep up as the baby boomers gradually pass the age 65 threshold. Children of school age (as a share of the county's total population) peaked in the 1970s and declined until 1985, but this share has held relative steady since then and is not expected to shift dramatically, per Moody's. From a workforce perspective, those in the middle cohorts (age 20-64) are not projected to present any major shocks to the county's working age population. Again, the national patterns may pose challenges for some parts of the US, but in Tarrant County these changes appear relatively minor, at least in percentage terms.

FIGURE 29. AGE STRUCTURE OF TARRANT COUNTY POPULATION, 1970 TO 2030



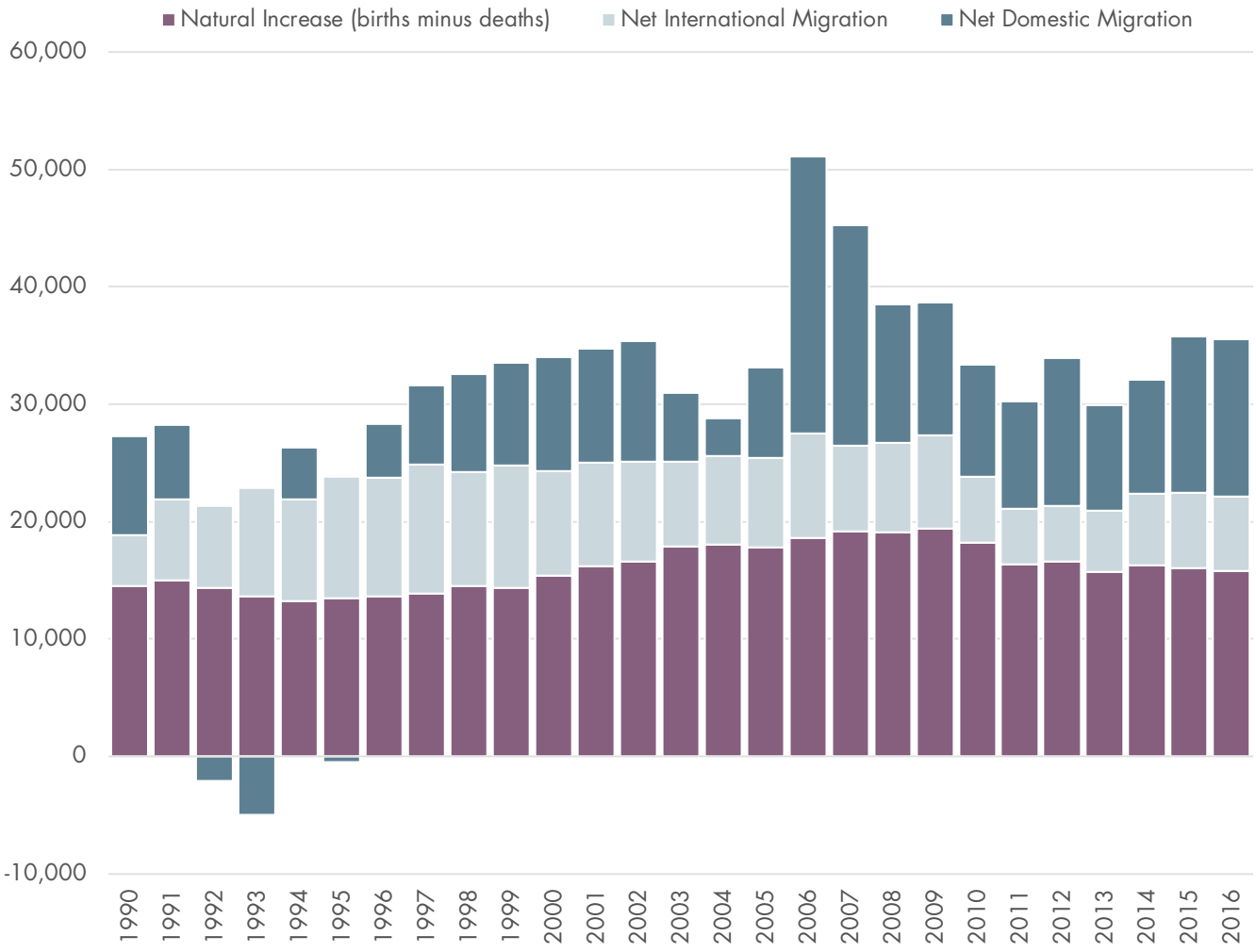
Sources: Moody's Analytics; US Census Bureau; TIP Strategies.

Three distinct forces drive population change. The first is the "natural" effect, calculated by adding the number of birth certificates and subtracting the number of death certificates in a particular region. Barring catastrophes or natural disasters, the difference between these two variables changes very slowly over time.

The second force driving population growth is immigration (the net number of new residents from abroad). This variable, too, shifts slowly over time. In decades past, any abrupt changes in year-to-year immigration numbers have been sensitive to federal policy shifts, but less sensitive to economic cycles. This is a logical pattern because anyone deciding to relocate their citizenship is making a permanent, lifetime decision that is less likely to be impacted by current economic cycles.

This leaves the third and most volatile element of population growth: domestic migration. This variable includes all existing US residents who relocate. Their decisions almost always go up and down with the economy. Figure 30 (below) shows how domestic migration has been the least predictable driver of Tarrant County's population growth over the past quarter century.

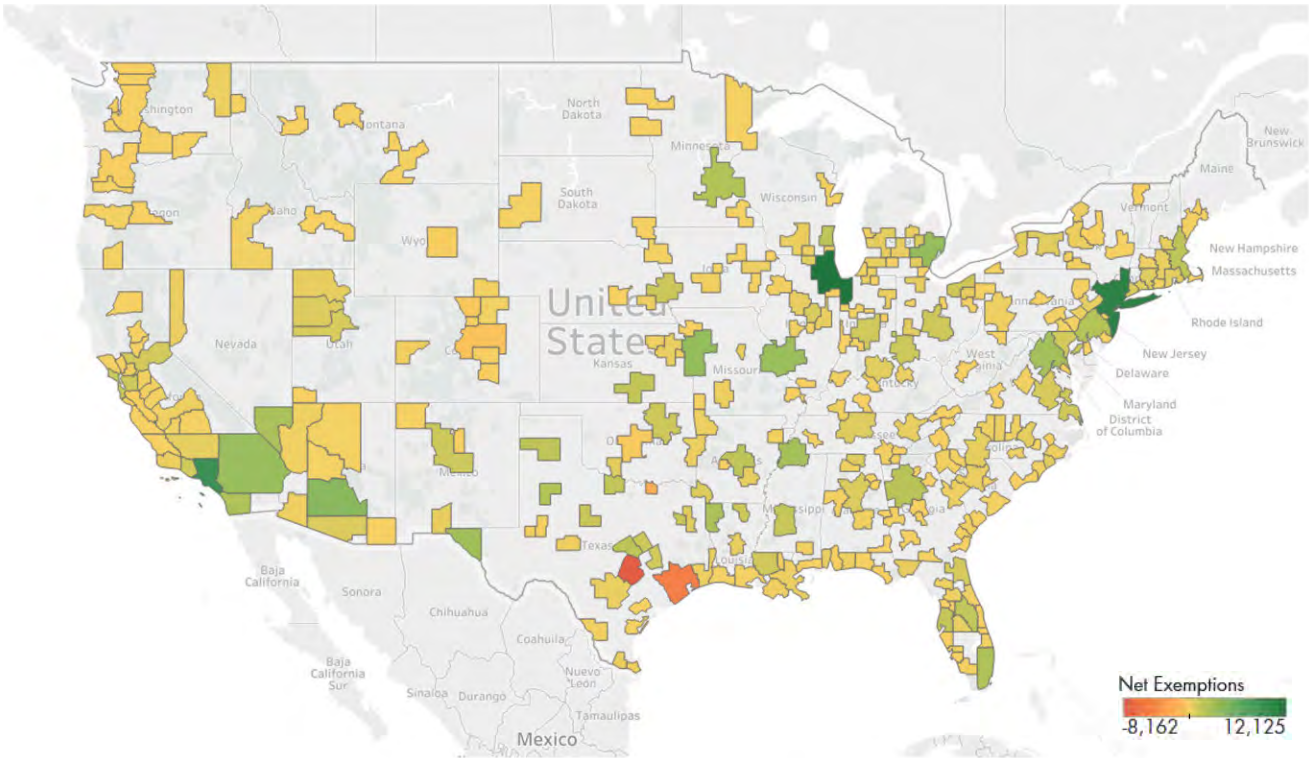
FIGURE 30. COMPONENTS OF TARRANT COUNTY POPULATION CHANGE, 1990-2016



Sources: Moody's Analytics; US Census Bureau; TIP Strategies.

This point about the volatility of domestic migration opens the door for further investigation. If the Dallas-Fort Worth metro area has been expanding with the demographic dynamism shown in Figures 27-30, then it is clearly attracting domestic migrants. But from where? The map below (Figure 31), which illustrates the five-year post-recession period of 2010–2014, may offer some surprises. It reveals that five US metropolitan areas had a substantial impact on the region's growth. (See further details in Figures 32-36.) The net inbound domestic migration was by far the highest from metropolitan Chicago, New York, and Los Angeles. As the map shows, most US metropolitan areas lost residents to Dallas-Fort Worth, though in smaller numbers than these three MSAs did. The biggest surprise below may be that Dallas-Fort Worth was losing residents to a handful of areas, and two MSAs in particular. On a net basis, the Dallas-Fort Worth MSA lost residents to metropolitan Austin and Houston during the same five-year period. To be sure, the net flows with Houston have tipped back and forth over time, and 2010–2014 was a boom period for the energy industry, something that has historically worked in Houston's favor. Austin's pattern differs; it has persisted more consistently over economic cycles.

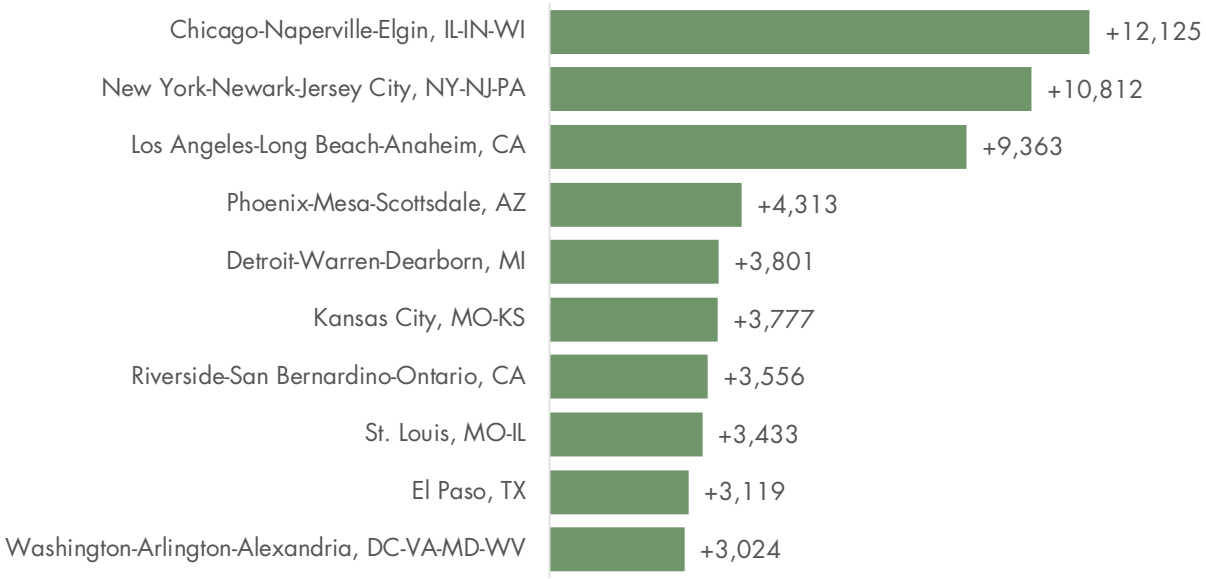
FIGURE 31. NET DOMESTIC MIGRATION TO/FROM DALLAS-FORT WORTH MSA, 2010 TO 2014
NET MIGRATION INBOUND TO (AND OUTBOUND FROM) DALLAS-FORT WORTH MSA



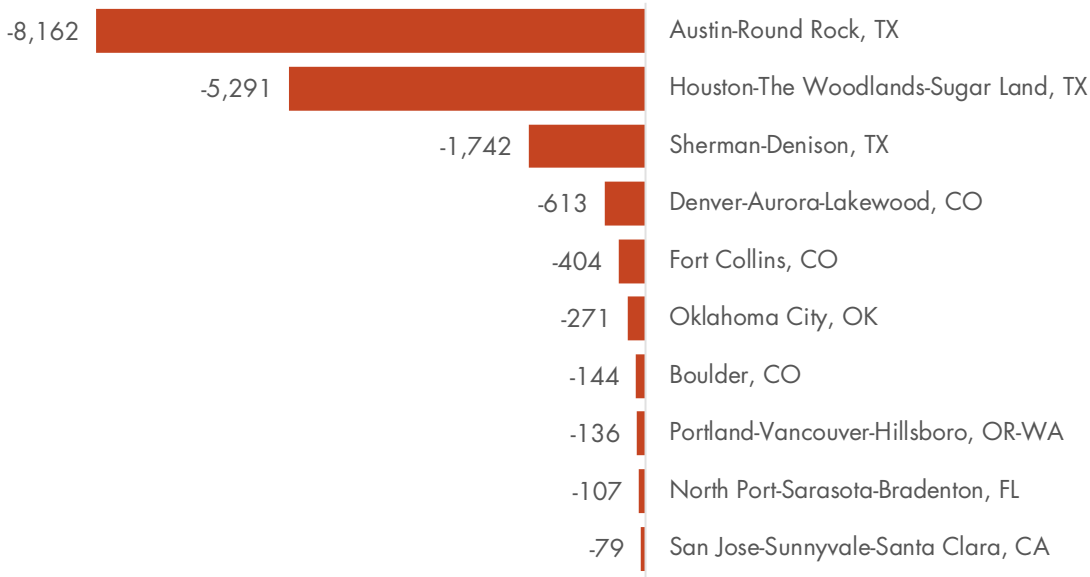
Source: IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Dallas-Fort Worth MSA counties from outside the area) and outbound migrants (those relocating from the Dallas-Fort Worth MSA to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 32. NET MIGRATION FLOWS TO/FROM DALLAS-FORT WORTH MSA, 2010-2014

TOP 10 DOMESTIC ORIGINS FOR NET MIGRANTS RELOCATING TO THE DALLAS-FORT WORTH MSA

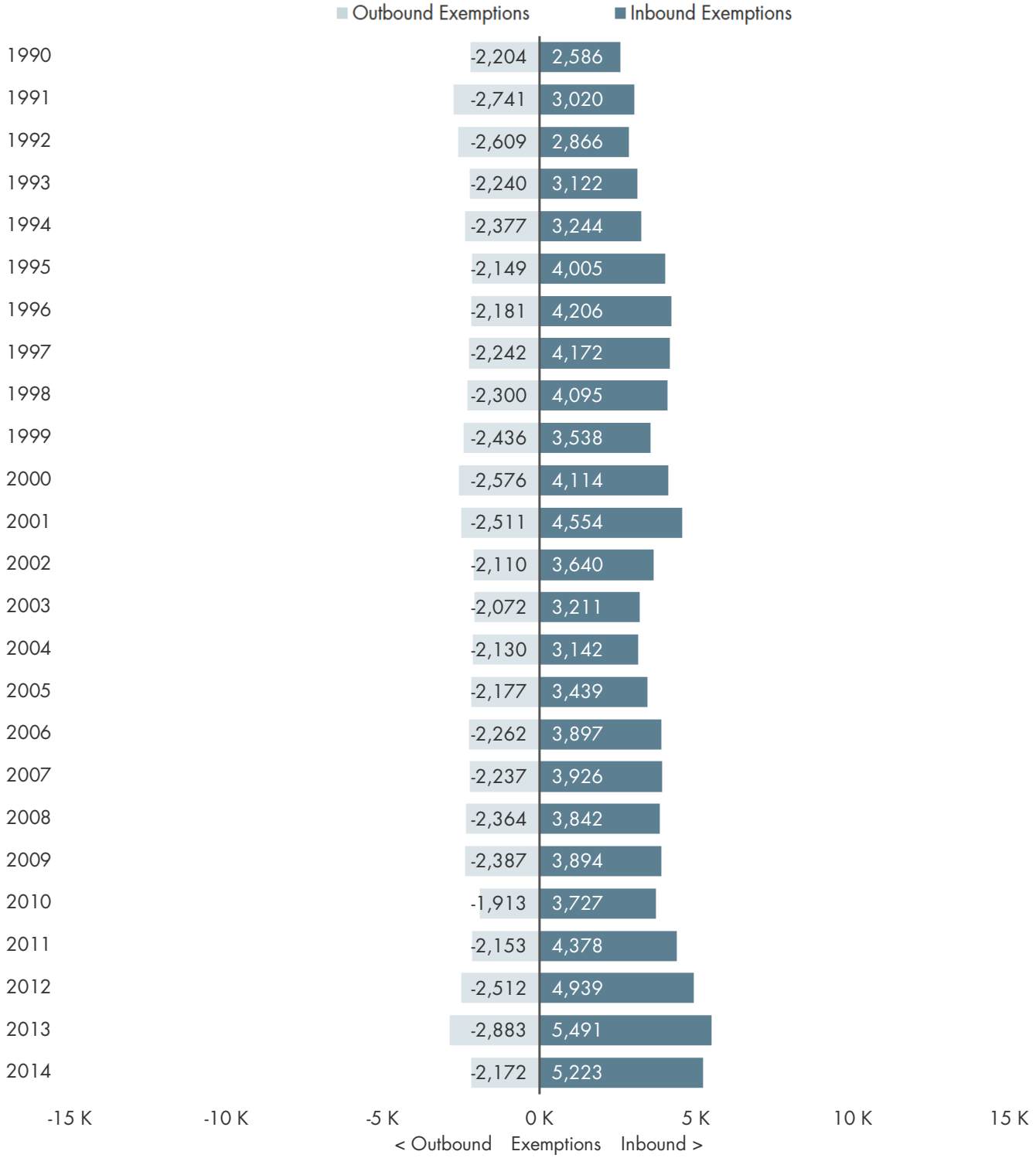


TOP 10 DOMESTIC DESTINATIONS FOR NET MIGRANTS LEAVING THE DALLAS-FORT WORTH MSA



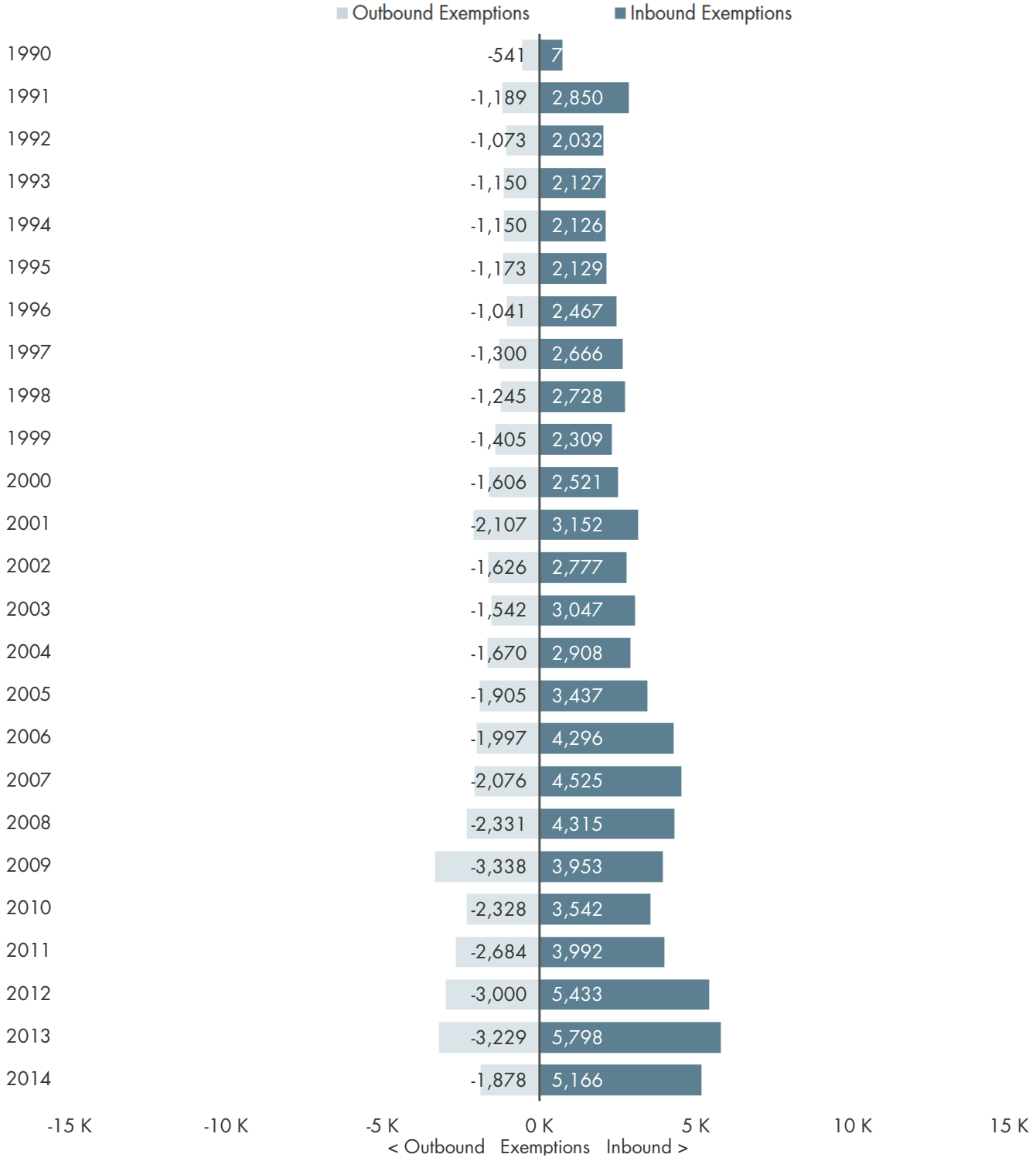
Source (both figures): IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Dallas-Fort Worth MSA counties from outside the area) and outbound migrants (those relocating from the Dallas-Fort Worth MSA to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 33. GROSS DOMESTIC MIGRATION BETWEEN DALLAS-FORT WORTH & CHICAGO MSA



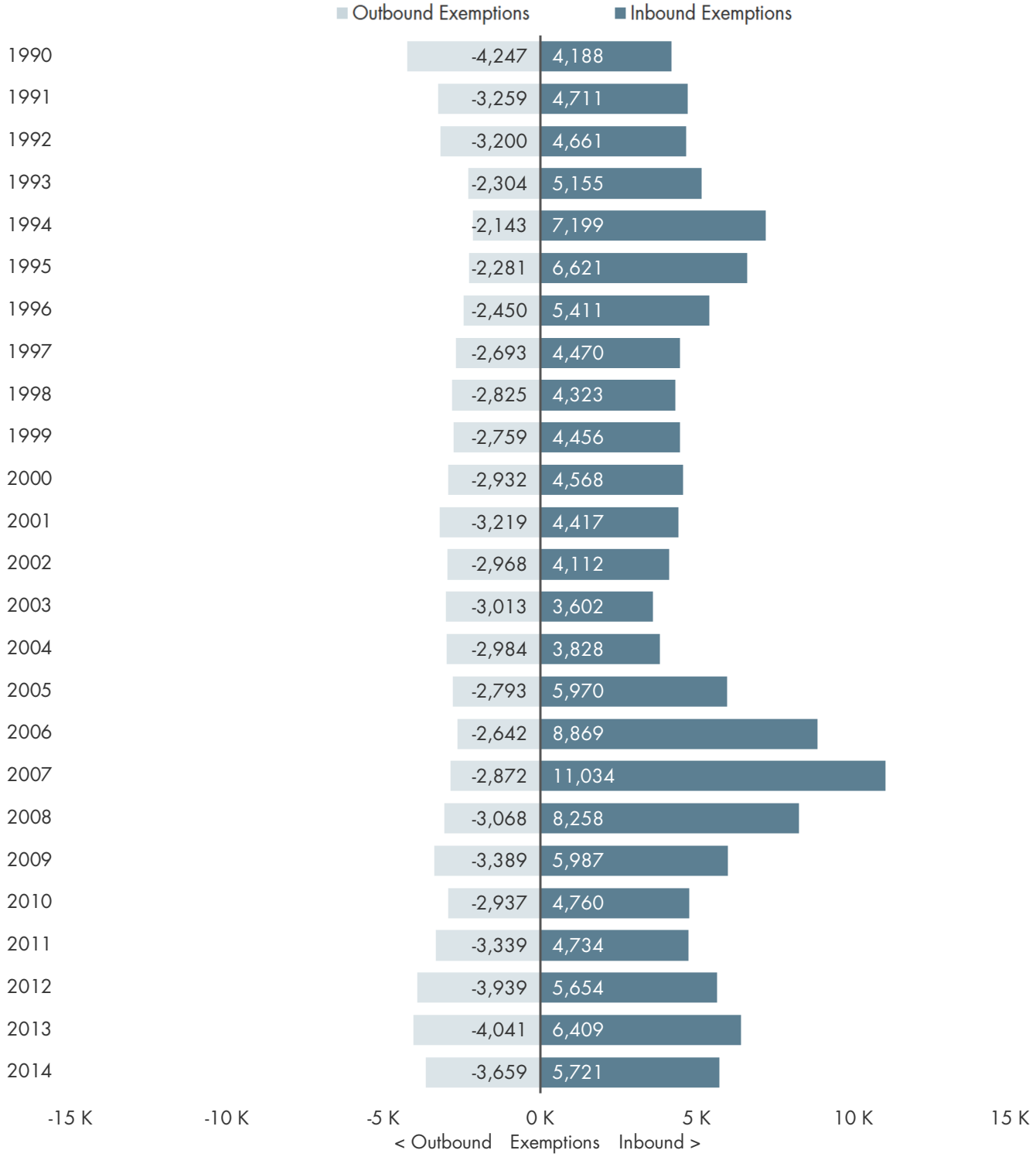
Source: IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Dallas-Fort Worth MSA counties from outside the area) and outbound migrants (those relocating from the Dallas-Fort Worth MSA to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 34. GROSS DOMESTIC MIGRATION BETWEEN DALLAS-FORT WORTH & NEW YORK MSA



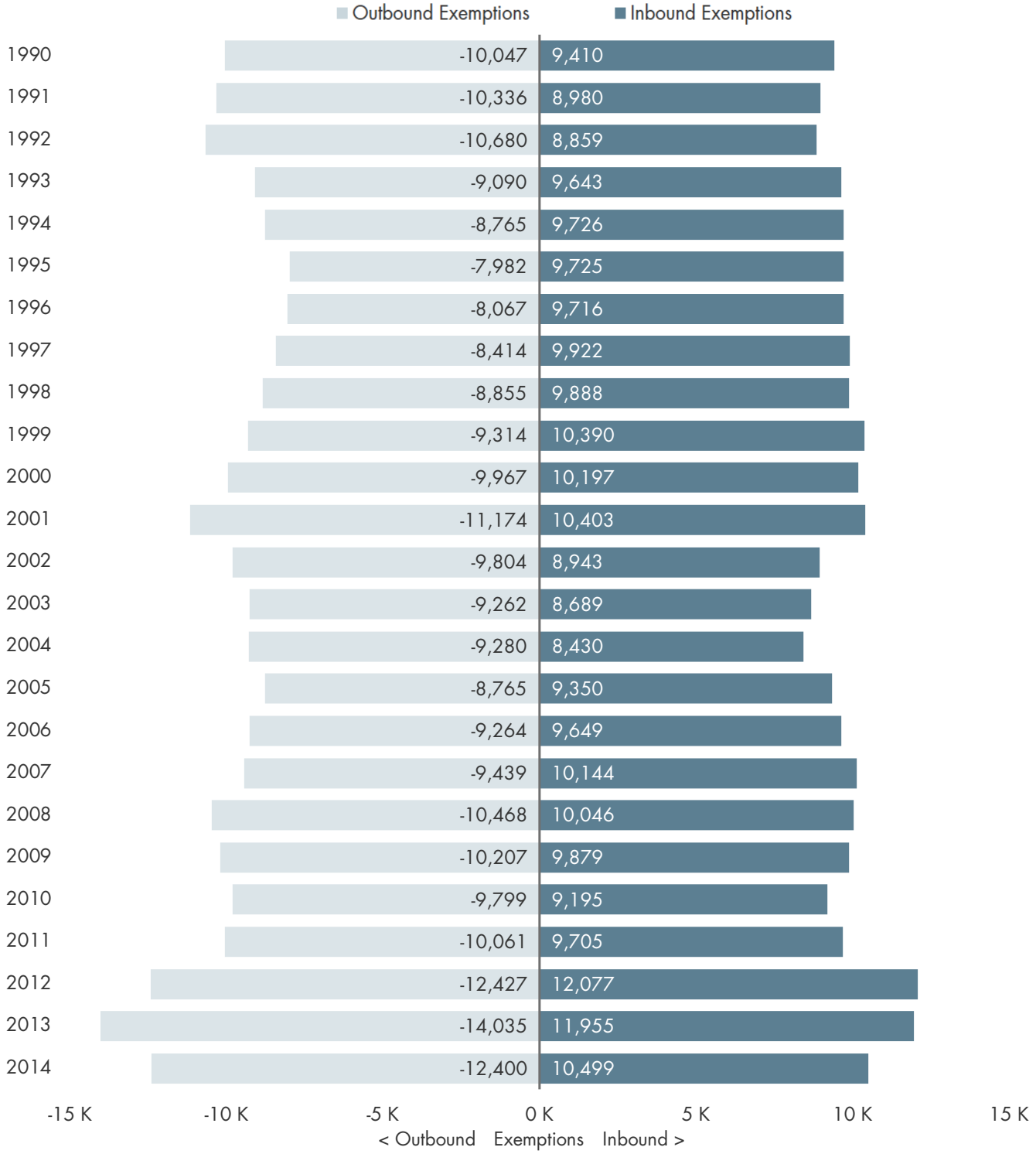
Source: IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Dallas-Fort Worth MSA counties from outside the area) and outbound migrants (those relocating from the Dallas-Fort Worth MSA to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 35. GROSS DOMESTIC MIGRATION BETWEEN DALLAS-FORT WORTH & LOS ANGELES MSA



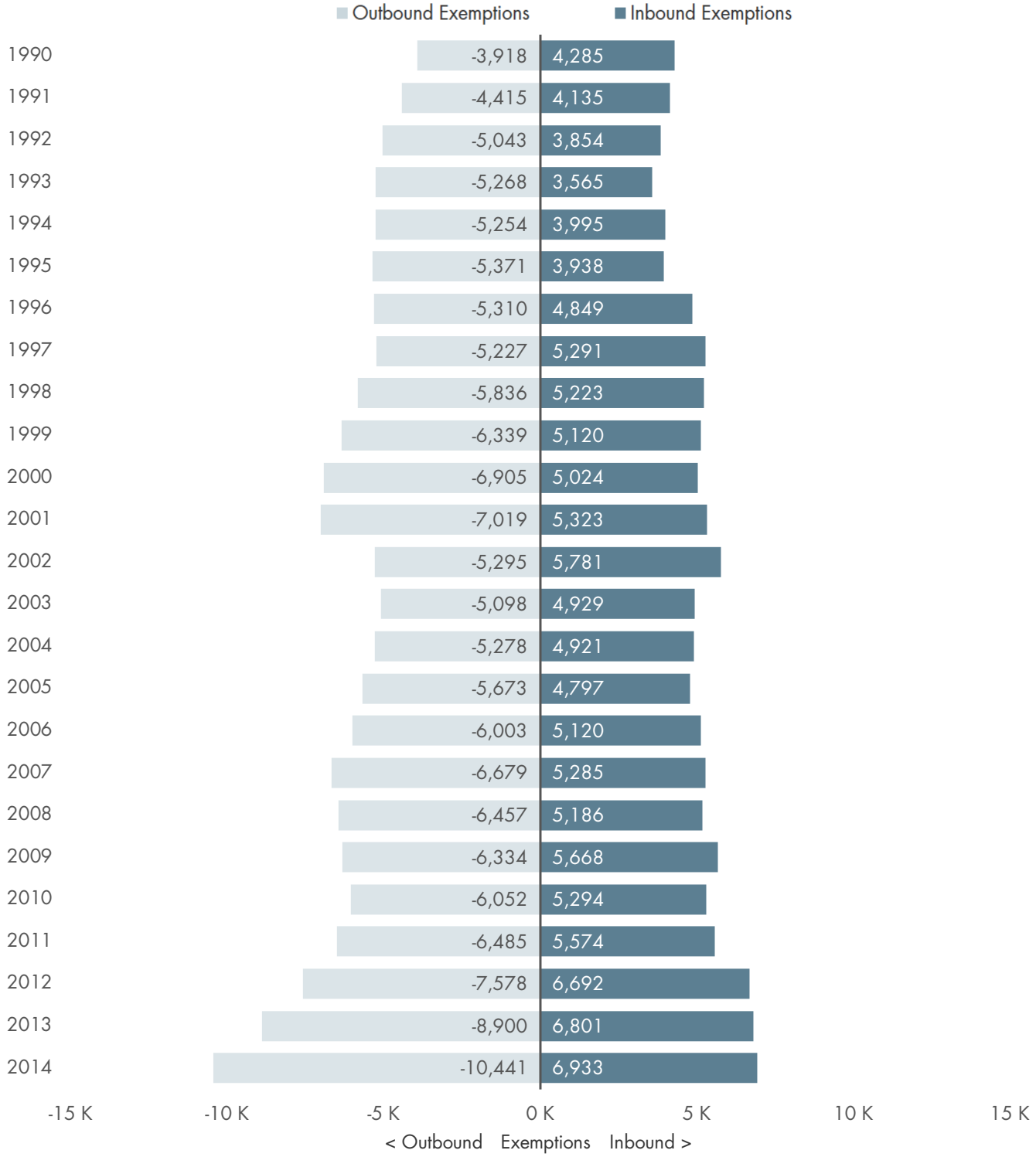
Source: IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Dallas-Fort Worth MSA counties from outside the area) and outbound migrants (those relocating from the Dallas-Fort Worth MSA to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 36. GROSS DOMESTIC MIGRATION BETWEEN DALLAS-FORT WORTH & HOUSTON MSA



Source: IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Dallas-Fort Worth MSA counties from outside the area) and outbound migrants (those relocating from the Dallas-Fort Worth MSA to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

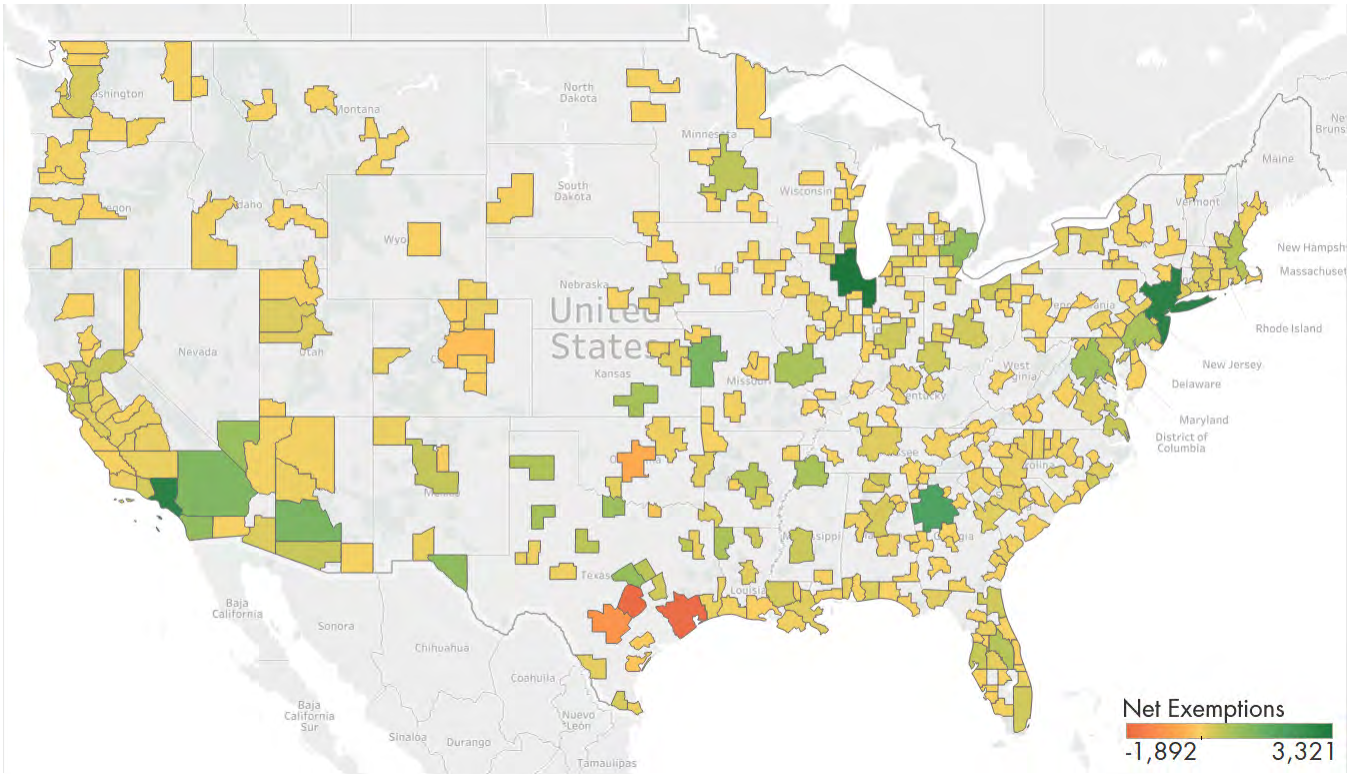
FIGURE 37. GROSS DOMESTIC MIGRATION BETWEEN DALLAS-FORT WORTH & AUSTIN MSA



Source: IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Dallas-Fort Worth MSA counties from outside the area) and outbound migrants (those relocating from the Dallas-Fort Worth MSA to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

While Figures 31-37 show metropolitan migration patterns for the Dallas-Fort Worth MSA overall, Figures 38-46 show the same patterns within the Fort Worth MD. The MD patterns are similar but with a few subtle differences. Chicago remains the prime source of net inbound migration for the Fort Worth MD as it does for the larger MSA, but the Dallas MD alone (not shown on the map) edges in just ahead of Los Angeles and New York as the second leading source of net migration in the 2010-2014 period. Atlanta does not appear among the 10 leading sources of inbound migration to the Dallas-Fort Worth MSA as a whole, yet it checks in among the top five sources of new residents for the Fort Worth MD. Similar to the MSA as a whole, Austin and Houston were the main locations where Fort Worth residents were most likely to relocate (on a net basis). Net outbound migration to San Antonio and Oklahoma City from the MD outpaced the MSA totals overall, though the net losses to these locations were relatively small during the 2010-2014 period.

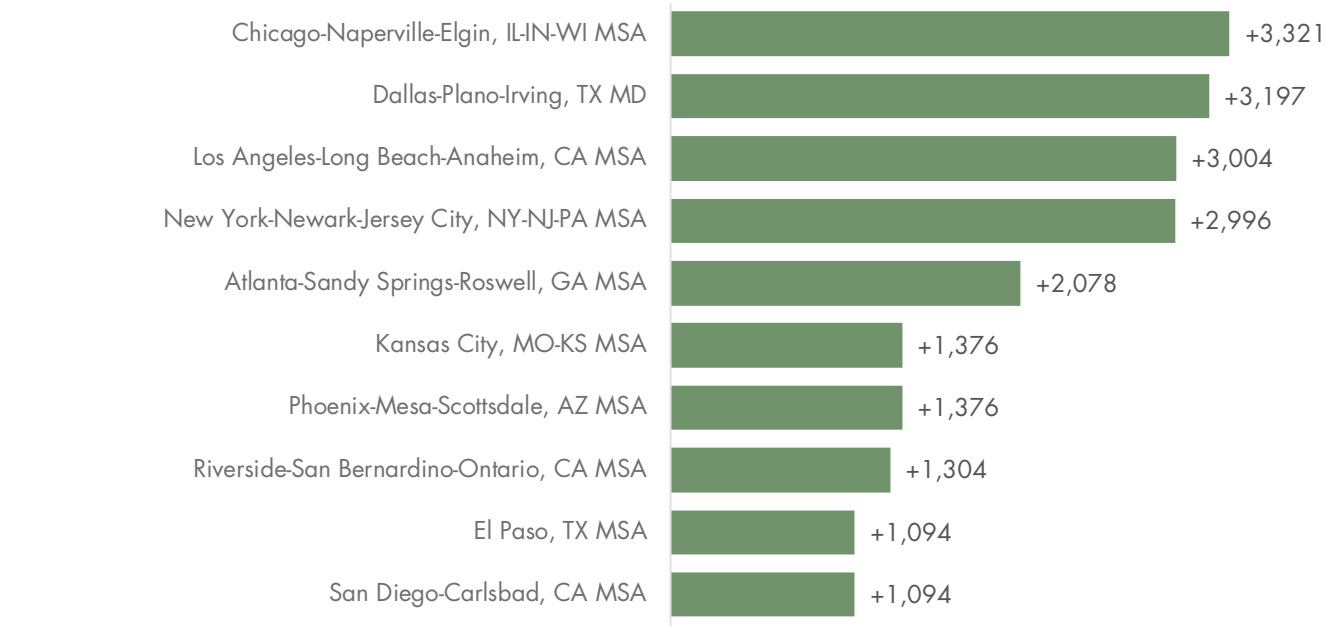
FIGURE 38. NET DOMESTIC MIGRATION TO/FROM THE FORT WORTH MD BY MSA*, 2010-2014
NET MIGRATION INBOUND TO (AND OUTBOUND FROM) FORT WORTH MD



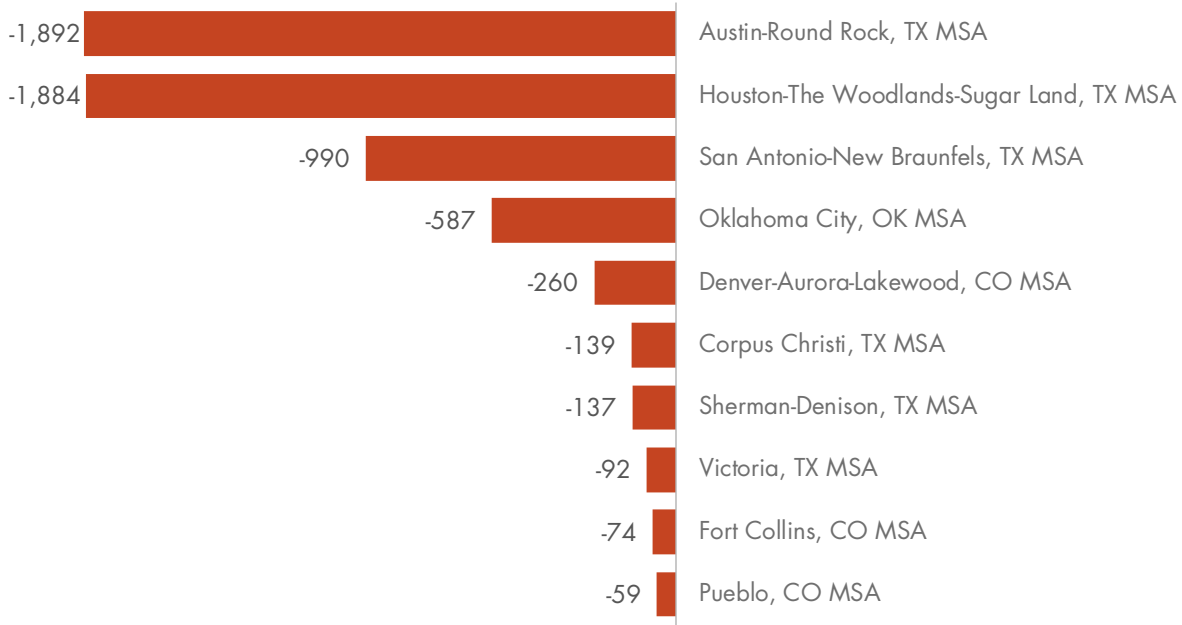
*Only MSA boundaries are highlighted. The Dallas MD is not shown.
Source: IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 39. NET MIGRATION FLOWS TO/FROM THE FORT WORTH MD, 2010-2014

TOP 10 DOMESTIC ORIGINS* FOR NET MIGRANTS RELOCATING TO THE FORT WORTH MD

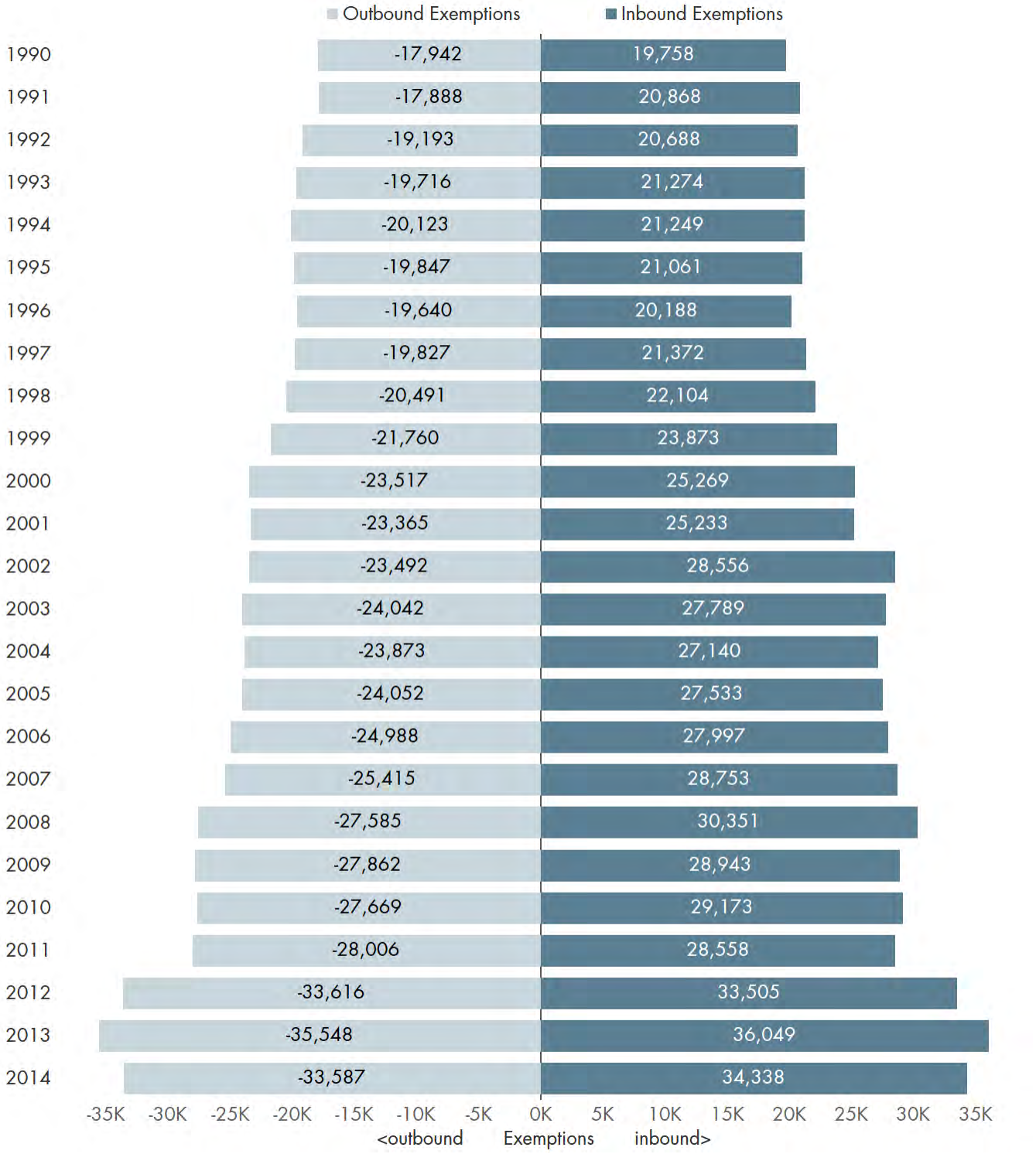


TOP 10 DOMESTIC DESTINATIONS FOR NET MIGRANTS LEAVING THE FORT WORTH MD, 2010-2014



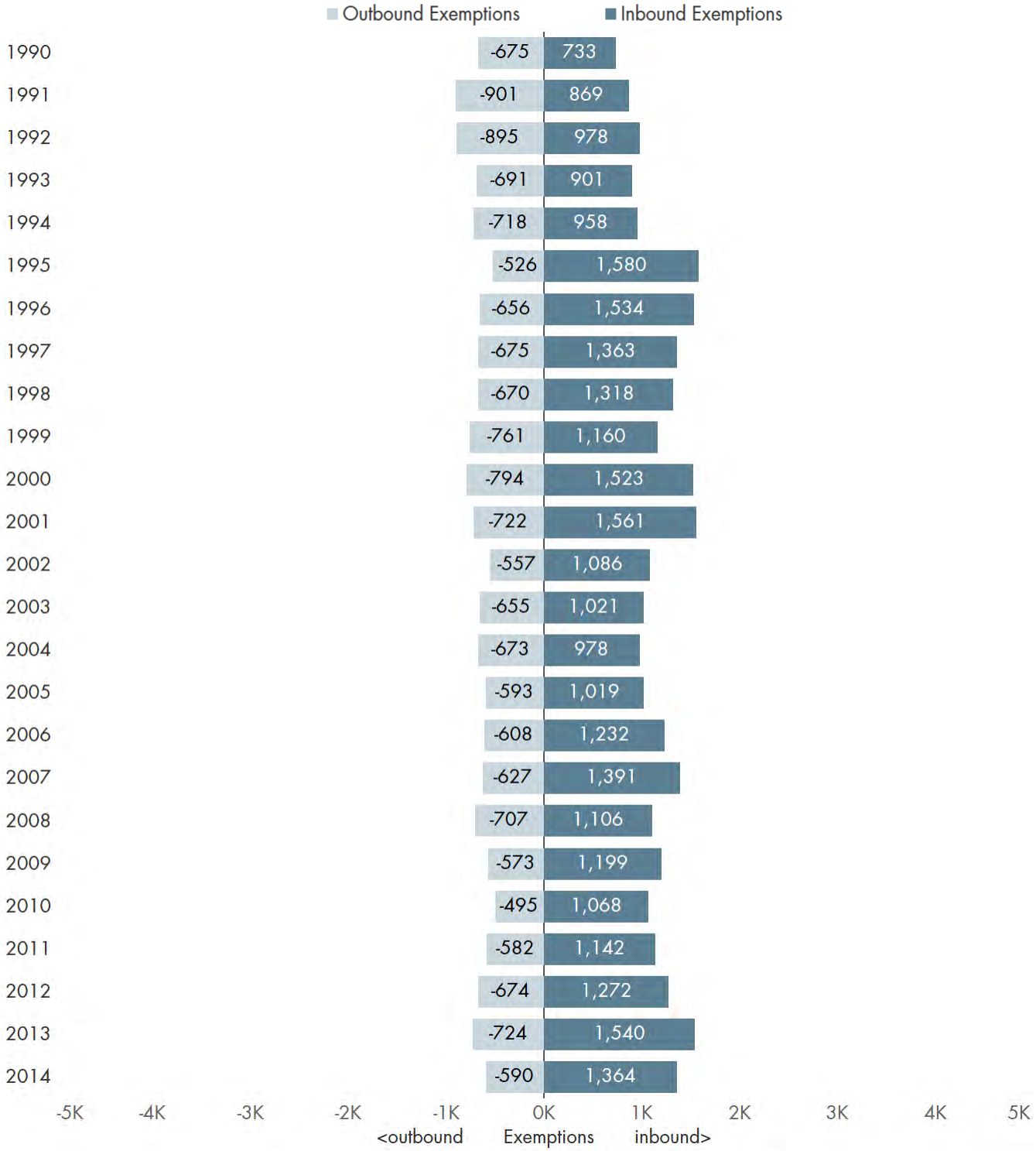
*All origins shown are MSAs except for the Dallas MD.
Source (both figures): IRS via Moody's Analytics.
Note: Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 40. GROSS DOMESTIC MIGRATION BETWEEN THE FORT WORTH MD & THE DALLAS MD



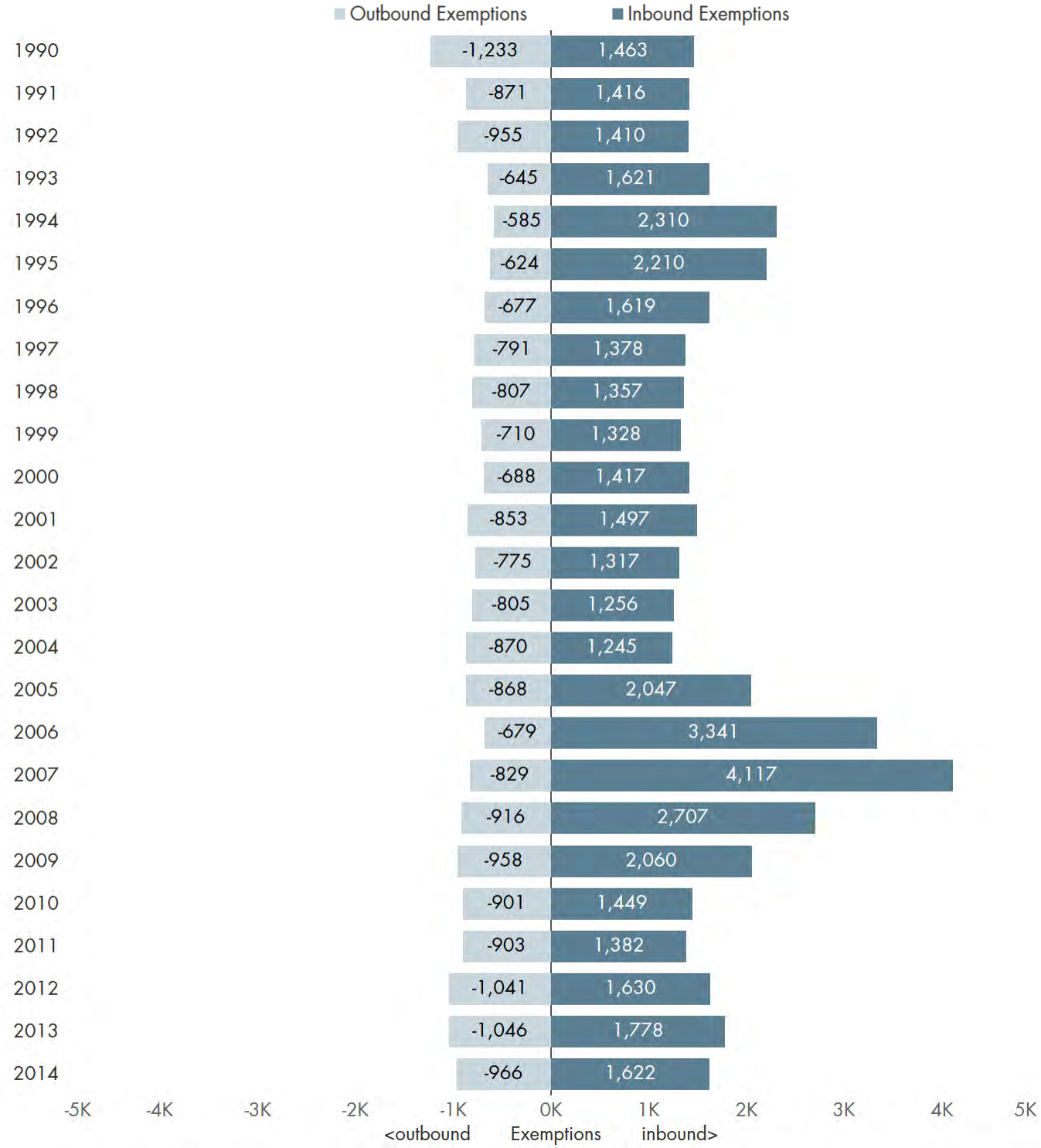
Source: IRS via Moody's Analytics.
Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 41. GROSS DOMESTIC MIGRATION BETWEEN THE FORT WORTH MD & THE CHICAGO MSA



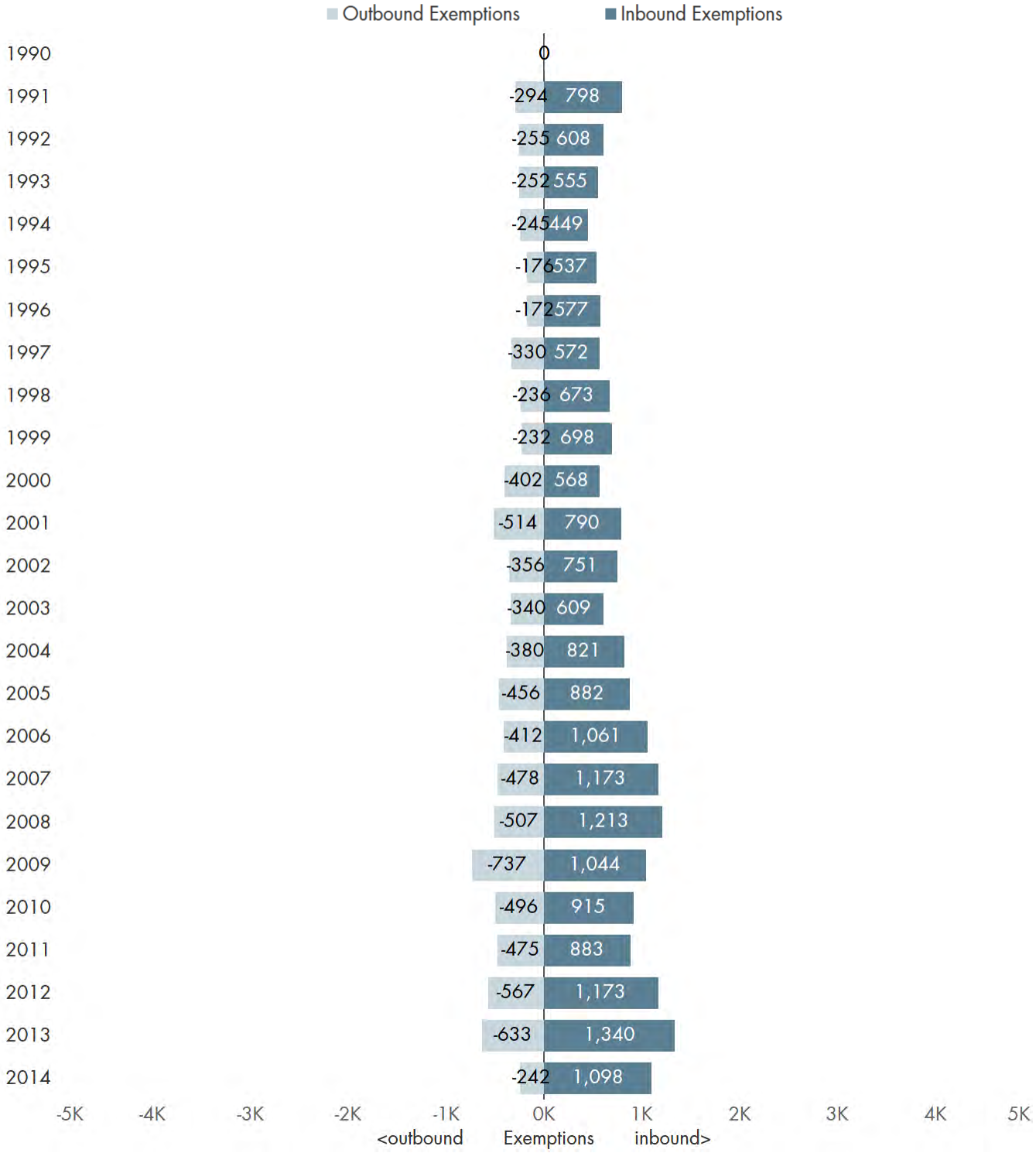
Source: IRS via Moody's Analytics.
Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 42. GROSS DOMESTIC MIGRATION BETWEEN THE FORT WORTH MD & LOS ANGELES MSA



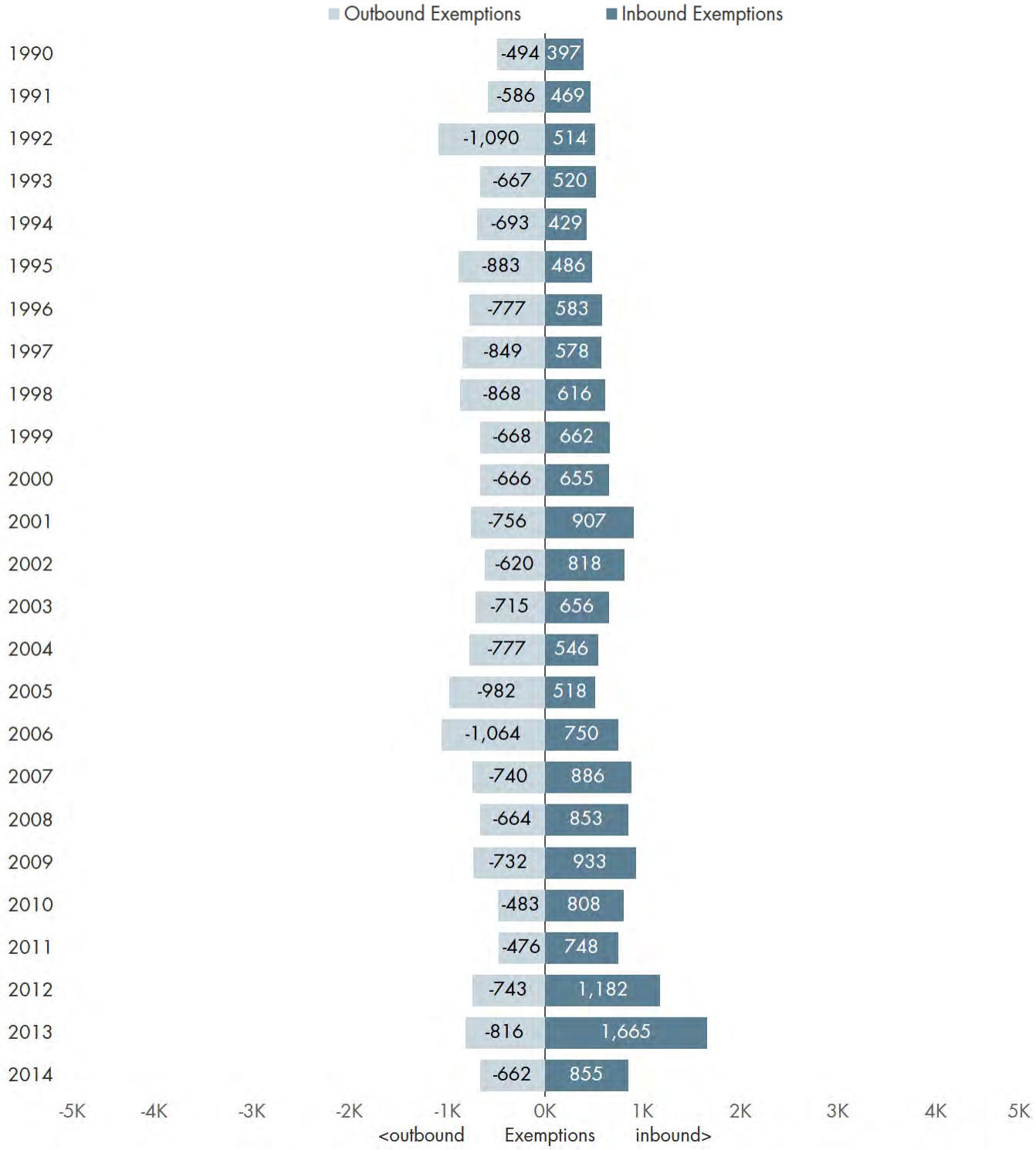
Source: IRS via Moody's Analytics.
Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 43. GROSS DOMESTIC MIGRATION BETWEEN HE FORT WORTH MD & THE NEW YORK MSA



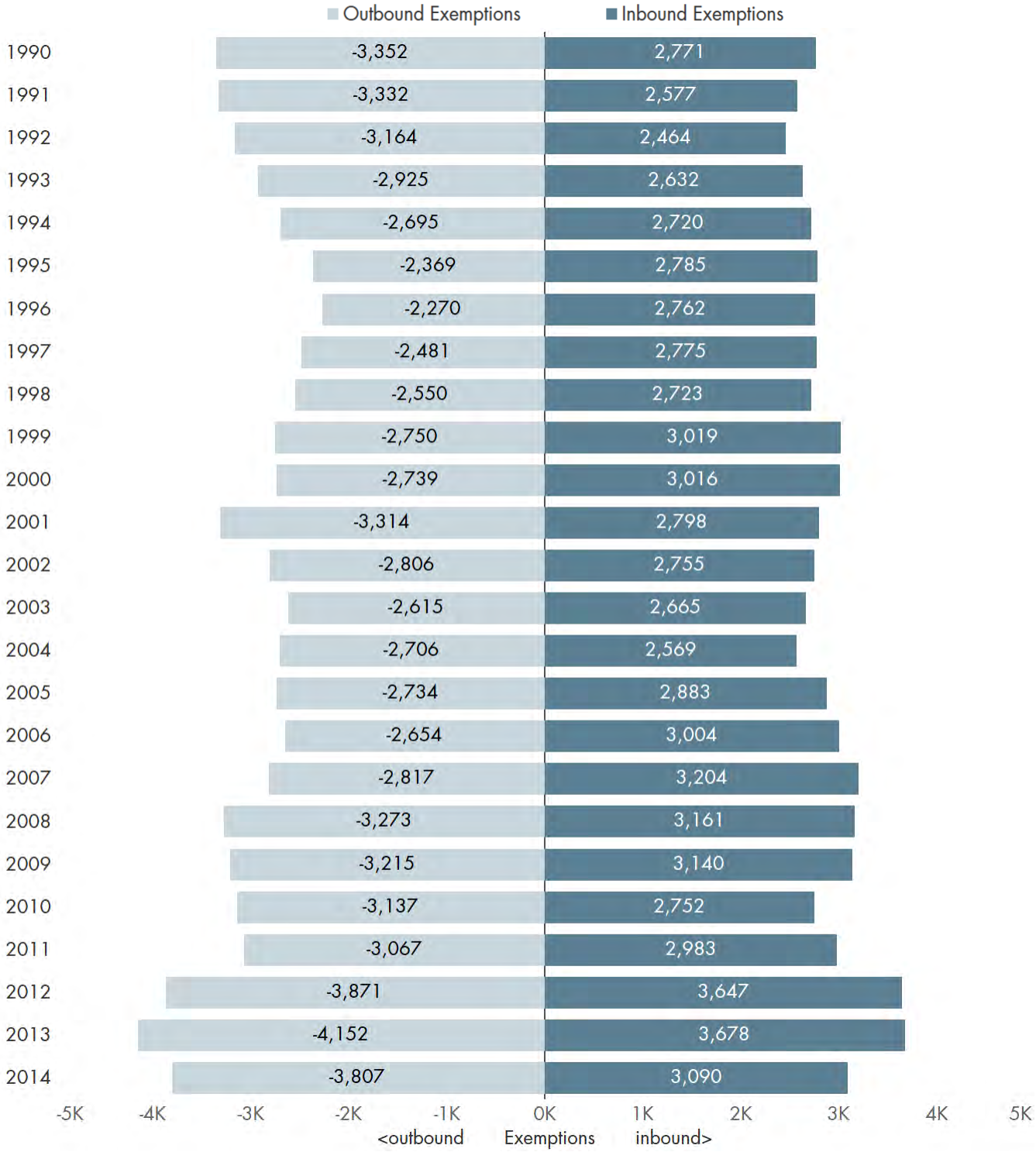
Source: IRS via Moody's Analytics.
Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 44. GROSS DOMESTIC MIGRATION BETWEEN THE FORT WORTH MD & THE ATLANTA MSA



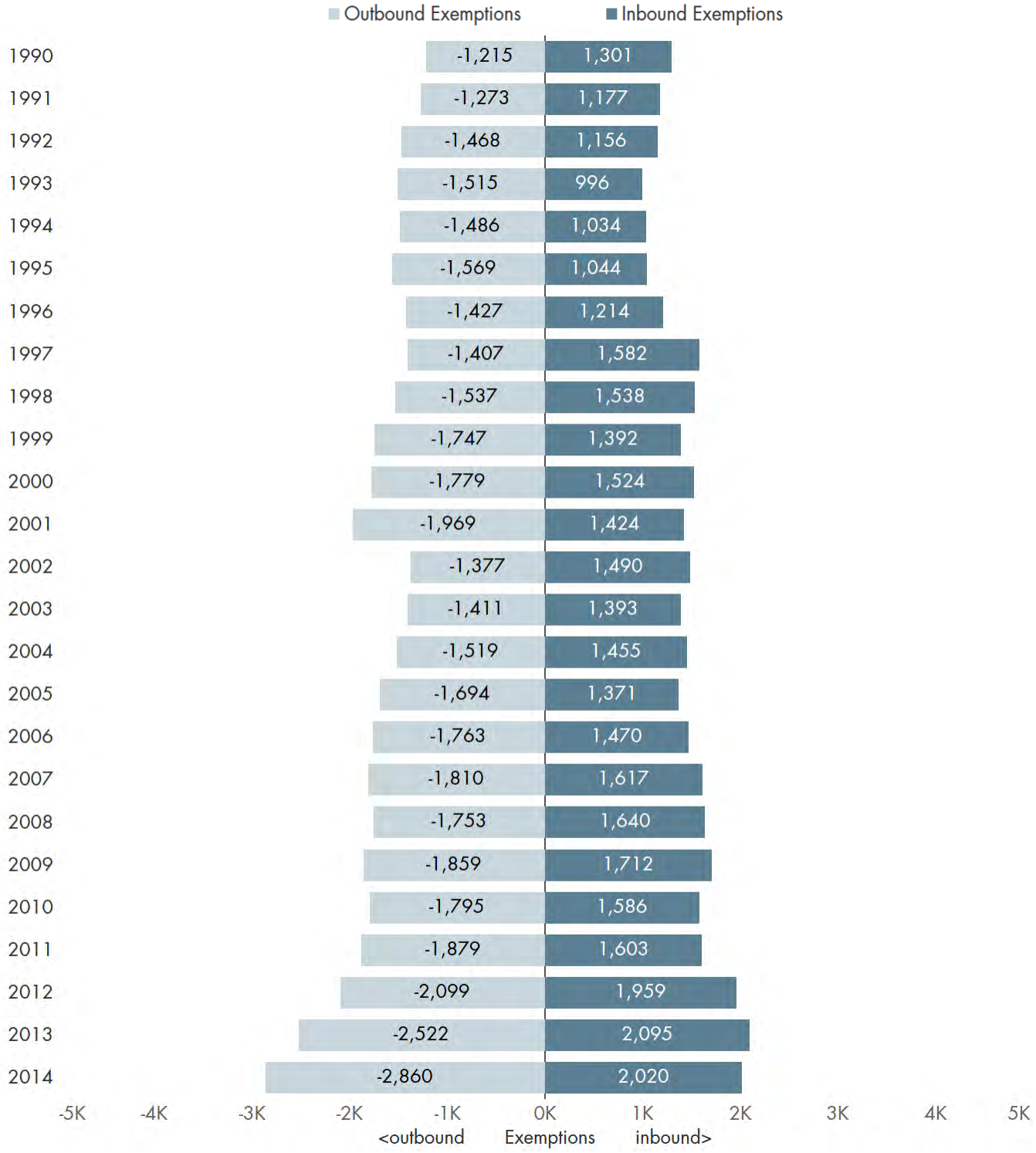
Source: IRS via Moody's Analytics.
Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 45. GROSS DOMESTIC MIGRATION BETWEEN THE FORT WORTH MD & THE HOUSTON MSA



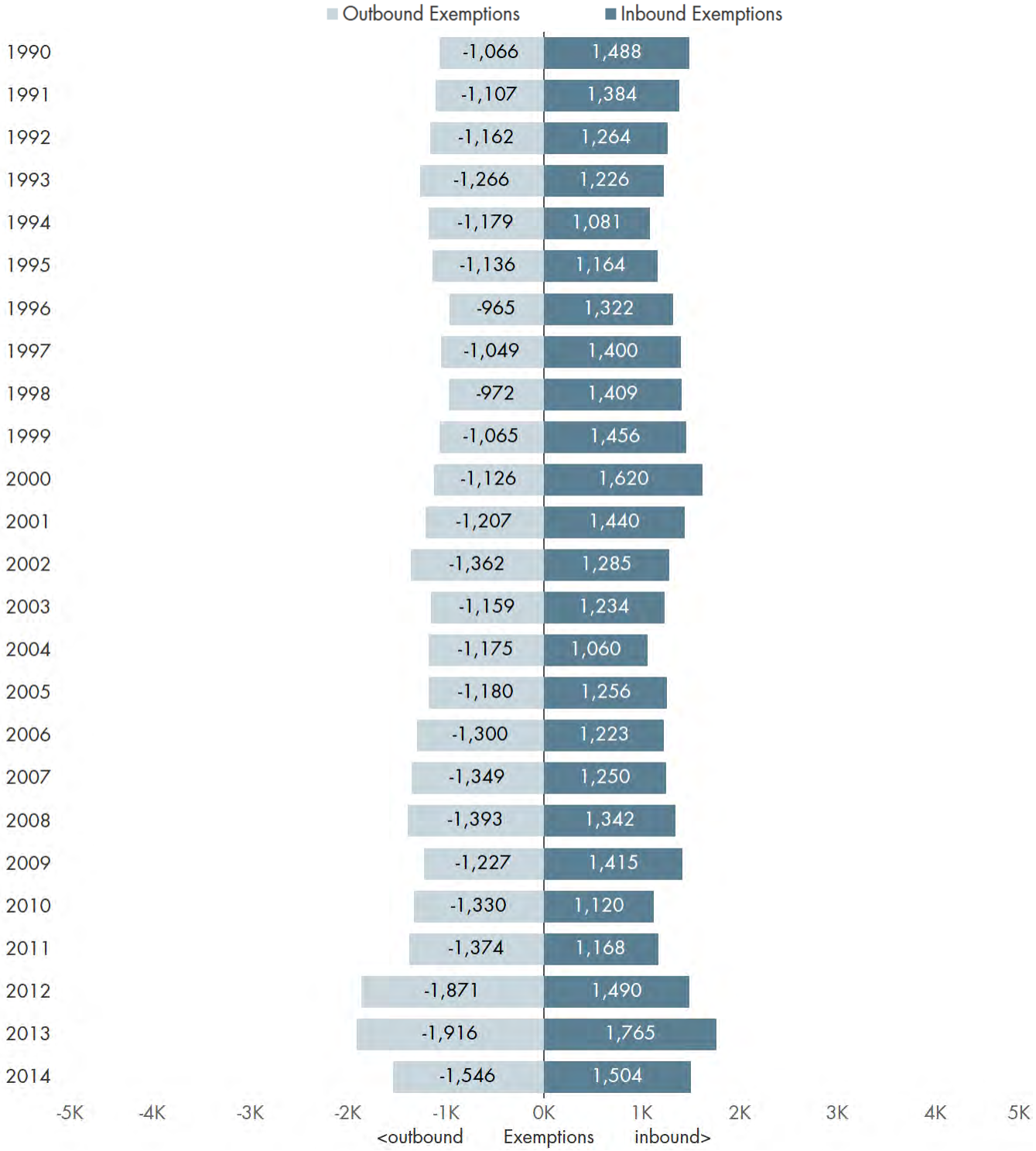
Source: IRS via Moody's Analytics.
Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 46. GROSS DOMESTIC MIGRATION BETWEEN THE FORT WORTH MD & THE AUSTIN MSA



Source: IRS via Moody's Analytics.
Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 47. GROSS DOMESTIC MIGRATION BETWEEN THE FORT WORTH MD & THE SAN ANTONIO MSA



Source: IRS via Moody's Analytics.
Domestic migration flows are based on year-over-year address changes on federal tax returns using exemptions as a proxy for population. Net migration figures represent the difference between inbound migrants (those moving to one of the Fort Worth-Arlington MD counties from outside the area) and outbound migrants (those relocating from the Fort Worth-Arlington MD to other US counties). IRS data are compiled from administrative records and include only tax filers. As a result, they differ from other estimates of migration, including Census Bureau figures published separately.

FIGURE 48. SELECTED CHARACTERISTICS, 2015
COMPARISON OF FORT WORTH (CITY) TO SELECTED GEOGRAPHIES

	Fort Worth (city)	Tarrant County	Fort Worth-Arlington Metro Div.	Dallas-Plano-Irving Metro Div.	Dallas-Ft. Worth-Arl. MSA	Texas	USA
AGE							
Share of the total population							
Under 20 years	30.9%	29.6%	29.2%	29.1%	29.1%	29.2%	25.7%
20 to 64 years	59.8%	60.0%	59.4%	60.8%	60.3%	59.2%	59.5%
65 years and over	9.2%	10.5%	11.4%	10.2%	10.5%	11.7%	14.9%
Median age (in years)	32.6	34.3	35.1	34.5	34.7	34.4	37.8
RACE/ETHNICITY							
Share of the total population							
White, not Hispanic or Latino	39.9%	48.5%	53.7%	44.7%	47.7%	42.9%	61.5%
Hispanic or Latino, all races	35.4%	28.2%	26.2%	29.6%	28.4%	38.9%	17.6%
Black/African American	18.5%	15.6%	13.3%	16.1%	15.2%	11.7%	12.3%
American Indian/Alaska Native	0.2%	0.3%	0.3%	0.3%	0.3%	0.2%	0.6%
Asian	4.1%	5.2%	4.4%	7.3%	6.3%	4.5%	5.3%
Hawaiian/Pacific Islander	0.0%	0.2%	0.2%	0.0%	0.1%	0.1%	0.2%
Some other race	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%
Two or more	1.8%	2.0%	1.9%	1.9%	1.9%	1.6%	2.3%
FOREIGN-BORN							
As share of total population	17.1%	15.9%	14.0%	20.3%	18.2%	17.0%	13.5%
Year of entry (% of foreign-born)							
Entered after 2010	12.9%	15.1%	14.7%	16.6%	16.1%	16.3%	15.6%
Entered before 2010	87.1%	84.9%	85.3%	83.4%	83.9%	83.7%	84.4%
LANGUAGE SPOKEN AT HOME							
English only	66.3%	71.7%	74.4%	66.3%	69.0%	64.6%	78.5%
Language other than English	33.7%	28.3%	25.6%	33.7%	31.0%	35.4%	21.5%
Speaks English less than "very well"	14.4%	12.3%	11.0%	15.6%	14.1%	14.3%	8.6%
RESIDENCE 1 YEAR AGO							
Share of population 1 year and over							
Same house	82.6%	82.7%	83.6%	83.9%	83.8%	83.9%	85.3%
Different house, same county	12.0%	10.8%	9.9%	9.1%	9.4%	9.3%	8.5%
Different county, same state	2.8%	3.3%	3.5%	4.0%	3.9%	4.0%	3.2%
Different state	2.0%	2.3%	2.2%	2.2%	2.2%	2.0%	2.4%
Outside US	0.6%	0.9%	0.8%	0.8%	0.8%	0.8%	0.7%
HOUSING UNITS							
Share of occupied units							
Owner-occupied	56.3%	60.0%	62.4%	57.7%	59.3%	61.1%	63.0%
Renter-occupied	43.7%	40.0%	37.6%	42.3%	40.7%	38.9%	37.0%
Median value, owner-occupied units	$136,700	$153,200	$153,700	$189,000	$172,500	$152,000	$194,500

continued, next page

FIGURE 48. SELECTED CHARACTERISTICS, 2015 (CONTINUED)
COMPARISON OF FORT WORTH (CITY) TO SELECTED GEOGRAPHIES

	Fort Worth (city)	Tarrant County	Fort Worth-Arlington Metro Div.	Dallas-Plano-Irving Metro Div.	Dallas-Ft. Worth-Arl. MSA	Texas	USA
SCHOOL ENROLLMENT							
Pop. 3 yrs. and over enrolled in school							
Nursery school, preschool	6.4%	6.2%	6.0%	6.2%	6.1%	6.0%	6.0%
Kindergarten	5.7%	5.4%	5.2%	6.0%	5.7%	5.6%	5.0%
Elementary school (grades 1-8)	44.6%	43.4%	44.1%	44.3%	44.2%	43.4%	40.3%
High school (grades 9-12)	20.5%	21.0%	21.3%	20.9%	21.1%	21.1%	20.9%
College or graduate school	22.8%	24.1%	23.4%	22.6%	22.9%	24.0%	27.8%
EDUCATIONAL ATTAINMENT							
Population 25 years and over							
Less than 9th grade	10.0%	7.1%	6.9%	8.3%	7.8%	8.9%	5.5%
9th to 12th grade, no diploma	9.1%	7.5%	7.8%	7.7%	7.7%	8.7%	7.3%
High school graduate/equivalent	26.0%	24.1%	25.2%	21.2%	22.6%	25.3%	27.6%
Some college, no degree	21.3%	23.3%	23.8%	20.9%	21.9%	21.8%	20.7%
Associate's degree	6.3%	7.2%	7.1%	6.3%	6.6%	6.9%	8.2%
Bachelor's degree	18.8%	21.0%	20.0%	23.2%	22.1%	18.7%	19.0%
Graduate or professional degree	8.6%	9.8%	9.3%	12.3%	11.3%	9.7%	11.6%
% high school graduate or higher	80.9%	85.4%	85.4%	84.0%	84.4%	82.4%	87.1%
% bachelor's degree or higher	27.3%	30.8%	29.3%	35.5%	33.4%	28.4%	30.6%
INCOME AND BENEFITS (IN 2015 INFLATION-ADJUSTED DOLLARS)							
Total households							
Less than $10,000	6.6%	5.2%	5.2%	5.3%	5.2%	6.6%	6.9%
$10,000 to $14,999	4.8%	3.6%	3.5%	3.7%	3.6%	4.7%	5.0%
$15,000 to $24,999	10.4%	9.3%	9.4%	8.8%	9.0%	10.3%	10.2%
$25,000 to $34,999	10.3%	10.2%	10.0%	9.0%	9.4%	10.1%	9.8%
$35,000 to $49,999	12.7%	12.6%	12.7%	13.3%	13.1%	13.5%	13.2%
$50,000 to $74,999	19.5%	19.6%	19.6%	17.9%	18.5%	18.0%	17.8%
$75,000 to $99,999	13.4%	13.0%	12.8%	12.5%	12.6%	12.0%	12.2%
$100,000 to $149,999	12.6%	14.1%	14.5%	14.8%	14.7%	13.5%	13.6%
$150,000 to $199,999	5.3%	5.9%	5.8%	7.1%	6.6%	5.4%	5.5%
$200,000 or more	4.4%	6.7%	6.5%	7.5%	7.1%	6.0%	5.8%
Median household income (dollars)	$55,888	$60,737	$60,756	$62,142	$61,644	$55,653	$55,775
% WITH INCOME BELOW POVERTY LEVEL, PAST 12 MONTHS							
All people							
Under 18 years	22.5%	18.7%	18.5%	19.5%	19.2%	23.0%	20.7%
18 to 64 years	14.3%	11.7%	11.4%	11.9%	11.7%	13.8%	13.9%
65 years and over	10.3%	7.2%	6.9%	9.0%	8.2%	10.3%	9.0%

Source: US Census Bureau, 2015 American Community Survey 1-Year Estimates.

5. EMPLOYMENT PATTERNS

Local employment growth in the current economic expansion has outpaced the national average. With employment levels indexed to 100 in 2010, the US job base overall climbed 10 percent in the six years prior to 2016 compared to 14 percent for the state of Texas and 18 percent for the Dallas-Fort Worth MSA (Figure 49). What's happened within the Dallas-Fort Worth metro area is even more interesting. The Dallas MD has led the metro area's job growth with a 19 percent expansion between 2010 and 2016. The west side of the metro area—both the Fort Worth MD and the city at its center—grew by 14 percent during the same period. This was very much in line with the state average but fell considerably short of the pace experienced by the Dallas-led east side of the metro area.

FIGURE 49. COMPARATIVE EMPLOYMENT INDEXED TO 2010 BY GEOGRAPHY

	2010	2011	2012	2013	2014	2015	2016
USA	100	101	103	104	106	108	110
Texas	100	102	105	107	111	113	114
Dallas-Fort Worth (MSA)	100	102	105	108	112	115	118
Dallas (MD)	100	102	105	108	112	116	119
Fort Worth (MD)	100	103	106	108	111	113	114
City of Fort Worth	100	102	105	108	110	112	114

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

The following pages (Figure 50 through Figure 55) help explain and unravel, sector by sector, what exactly happened with job growth over the six-year period from 2010 to 2016. The tables are arranged in descending geographic order from national (Figure 50) to state (Figure 51) to the Dallas-Fort Worth metro area (Figure 52). The metro area is presented in metropolitan divisions, with Dallas in Figure 53 and Fort Worth in Figure 54. Finally, the city of Fort Worth appears in Figure 55. These figures show the economic sectors in each of the geographic levels ranked by six-year job growth. When analyzing these numbers, keep in mind they reflect relative (percentage) growth rather than actual numbers; in other words, sectors with fewer jobs (like corporate/regional offices) can grow quite quickly while large employers (like manufacturing) may experience slower growth in percentage terms.

One sector that stands out in all the charts—from the US level down to the city of Fort Worth—is oil, gas, & mining. The dark shading early in the decade indicates the ramp-up in US oil exploration and fracking for natural gas, a job bonanza that peaked in 2014 and has since receded. What's left in the US chart are the sectors leading growth in this post-recession period. These include office-using jobs (corporate offices, professional services) and other types of services (healthcare; hotels; food services; arts, entertainment, & recreation; and administrative services). Transportation & warehousing also grew at a faster pace than the national average.

Within the Dallas-Fort Worth metro area, the transportation & warehousing sector grew at a 29 percent clip between 2010 and 2016, far outpacing the 15 percent national rate during the same period. On both sides of the metro area—Dallas to the east and Fort Worth to the west—healthcare employment grew faster than the pace of overall job growth. Yet, there is one sector of the regional economy where a sharp difference separates the metro area's east and west sides. Across the US, professional services employment (a major consumer of office space), rose 17 percent between 2010 and 2016. In Texas, this sector grew even faster, at a 25 percent rate during the 2010–2016 period, making it the third fastest growing part of the state's job market out of more than 20 economic sectors. It is this sector, professional services, where Dallas and Fort Worth most diverge in employment growth. The Dallas MD added jobs at a 29 percent pace in this sector, compared to just 7 percent for the Fort Worth MD (and the city).

It is also worth noting that the information sector of the economy—a catch-all category that includes old economy media (like newspapers) and new economy drivers (like software)—often appears in job statistics as a wash because of this sector's continuing evolution. The US netted just 4 percent job growth in this sector between 2010 and 2016. Likewise, information sector employment in the Dallas-Fort Worth Metro area remained relatively flat over the same period, reflecting a mix of job losses in Fort Worth (jobs in this sector shrank by 16 percent at the municipal level and 20 percent for the Fort Worth MD) that were offset by modest gains in employment in the Dallas MD.

FIGURE 50. US EMPLOYMENT INDEXED TO 2010 BY SECTOR

	2010	2011	2012	2013	2014	2015	2016
Corporate & regional offices	100	103	108	113	116	118	120
Lodging, restaurants, & bars	100	102	106	109	113	116	119
Administrative & support services	100	104	107	110	114	117	119
Professional services	100	103	105	108	111	114	117
Arts, entertainment, & recreation	100	101	104	106	109	113	116
Transportation & warehousing	100	102	103	105	108	113	115
Healthcare & social assistance	100	101	105	107	109	111	114
Construction	100	99	100	102	106	110	113
TOTAL	100	101	103	104	106	108	110
Retail trade	100	101	102	104	105	107	108
Property sales & leasing	100	99	100	102	105	107	108
Manufacturing	100	102	104	104	106	107	107
Wholesale trade	100	101	103	105	106	107	107
Agriculture & forestry	100	101	102	103	105	106	106
Finance & insurance	100	101	101	102	102	104	105
Personal & other services	100	101	104	98	101	102	104
Information	100	99	99	100	101	102	104
Educational services	100	100	100	101	102	102	103
Utilities	100	100	100	100	100	101	102
Local government	100	99	98	98	99	100	100
Oil, gas, & mining	100	112	122	124	129	115	98
State government	100	98	96	96	96	96	96
Federal government (civilian)	100	97	96	94	93	94	95

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 51. TEXAS EMPLOYMENT INDEXED TO 2010 BY SECTOR

	2010	2011	2012	2013	2014	2015	2016
Corporate & regional offices	100	105	110	113	139	147	150
Lodging, restaurants, & bars	100	104	108	114	118	123	127
Professional services	100	103	108	112	118	123	125
Arts, entertainment, & recreation	100	101	102	106	113	118	123
Administrative & support services	100	105	110	113	118	120	121
Transportation & warehousing	100	103	106	109	113	118	121
Healthcare & social assistance	100	102	105	108	111	114	117
Wholesale trade	100	103	108	112	115	119	117
Property sales & leasing	100	101	104	108	112	115	116
Construction	100	99	102	104	110	114	116
Retail trade	100	102	104	107	110	113	115
TOTAL	100	102	105	107	111	113	114
Finance & insurance	100	102	105	108	109	112	114
Oil, gas, & mining	100	114	131	140	148	131	111
Personal & other services	100	102	104	105	107	108	110
Educational services	100	100	98	100	102	104	105
Manufacturing	100	103	106	107	109	108	105
Utilities	100	101	101	102	102	104	104
Local government	100	99	98	99	101	103	104
Information	100	100	101	103	104	103	104
Agriculture & forestry	100	98	100	100	102	103	102
Federal government (civilian)	100	97	97	96	94	94	95
State government	100	98	95	94	93	93	93

FIGURE 52. DALLAS-FORT WORTH (MSA) EMPLOYMENT INDEXED TO 2010 BY SECTOR

	2010	2011	2012	2013	2014	2015	2016
Corporate & regional offices	100	105	108	110	135	142	143
Transportation & warehousing	100	102	105	108	111	120	129
Lodging, restaurants, & bars	100	103	108	113	117	123	127
Professional services	100	104	108	110	115	121	125
Administrative & support services	100	107	113	115	120	123	124
Healthcare & social assistance	100	103	108	111	116	122	124
Arts, entertainment, & recreation	100	100	102	107	115	120	123
Construction	100	99	103	107	113	118	122
Agriculture & forestry	100	106	111	116	119	122	120
Property sales & leasing	100	101	102	107	111	117	120
Retail trade	100	102	105	108	111	116	119
TOTAL	100	102	105	108	112	115	118
Wholesale trade	100	102	105	108	113	118	117
Finance & insurance	100	103	107	110	111	114	115
Personal & other services	100	102	105	107	109	110	113
Educational services	100	100	99	102	104	104	108
Local government	100	98	98	99	101	103	105
Manufacturing	100	102	103	104	104	104	104
Oil, gas, & mining	100	113	134	130	140	121	103
Utilities	100	106	100	100	101	101	101
Information	100	100	99	100	101	99	100
State government	100	101	96	101	108	99	95
Federal government (civilian)	100	95	94	94	91	91	92

Sources (both figures this page): US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 53. DALLAS (MD) EMPLOYMENT INDEXED TO 2010 BY SECTOR

	2010	2011	2012	2013	2014	2015	2016
Corporate & regional offices	100	105	105	108	137	143	145
Transportation & warehousing	100	101	105	110	112	122	134
Lodging, restaurants, & bars	100	103	107	113	117	124	129
Professional services	100	104	109	111	117	125	129
Administrative & support services	100	106	112	115	120	125	127
Arts, entertainment, & recreation	100	101	103	108	115	123	126
Agriculture & forestry	100	109	115	118	122	127	124
Healthcare & social assistance	100	103	108	110	115	122	124
Construction	100	99	103	107	113	119	123
Property sales & leasing	100	101	103	108	113	118	123
Retail trade	100	103	106	109	113	118	121
TOTAL	100	102	105	108	112	116	119
Finance & insurance	100	102	106	110	113	118	118
Wholesale trade	100	101	104	108	113	119	117
Personal & other services	100	102	104	105	108	110	113
Educational services	100	100	99	102	105	104	110
Local government	100	98	98	99	101	104	105
Information	100	100	101	102	104	103	105
Manufacturing	100	101	101	100	100	101	103
Utilities	100	108	101	101	102	103	103
Oil, gas, & mining	100	112	128	112	112	104	98
State government	100	102	97	104	115	103	97
Federal government (civilian)	100	94	92	91	88	89	89

FIGURE 54. FORT WORTH (MD) EMPLOYMENT INDEXED TO 2010 BY SECTOR

	2010	2011	2012	2013	2014	2015	2016
Corporate & regional offices	100	105	123	120	126	135	133
Healthcare & social assistance	100	104	109	114	117	122	125
Lodging, restaurants, & bars	100	104	110	113	117	121	123
Transportation & warehousing	100	103	105	105	110	118	122
Construction	100	99	102	107	112	116	120
Arts, entertainment, & recreation	100	100	101	105	115	117	119
Wholesale trade	100	103	106	109	112	116	118
Administrative & support services	100	108	113	117	120	117	117
Agriculture & forestry	100	102	106	114	115	117	116
TOTAL	100	103	106	108	111	113	114
Retail trade	100	101	102	105	108	112	114
Property sales & leasing	100	100	102	103	106	112	112
Personal & other services	100	104	107	110	111	112	112
Professional services	100	101	103	104	106	107	107
Manufacturing	100	103	106	111	113	111	107
Oil, gas, & mining	100	114	139	144	161	134	107
Educational services	100	100	99	100	102	104	105
Finance & insurance	100	104	107	107	105	102	105
Local government	100	99	99	100	102	103	104
Utilities	100	101	100	96	99	97	99
Federal government (civilian)	100	98	99	102	96	97	97
State government	100	99	95	94	93	90	89
Information	100	97	94	93	89	81	80

Sources (both figures this page): US Bureau of Labor Statistics, Emsi, TIP Strategies.

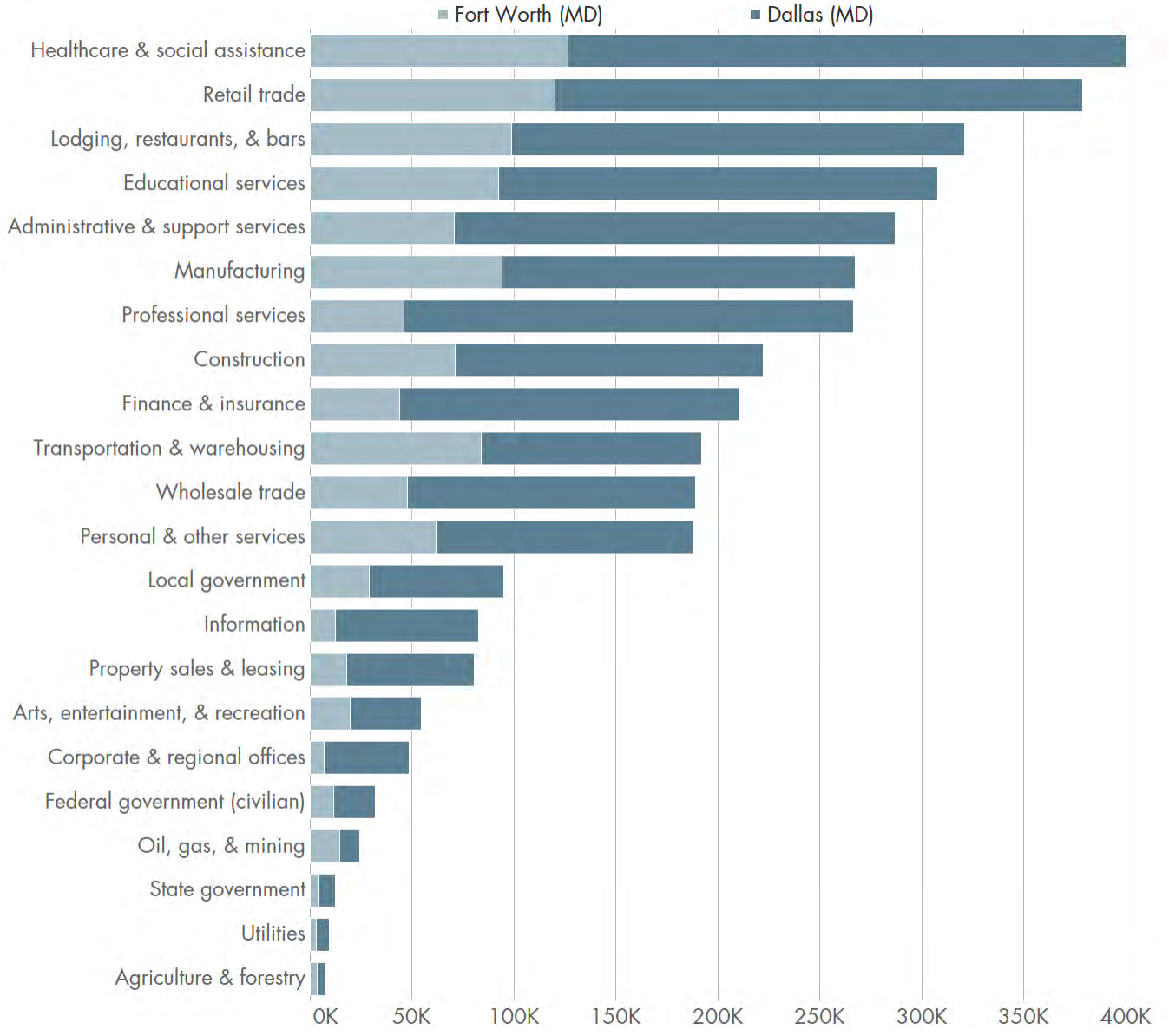
FIGURE 55. FORT WORTH (CITY) EMPLOYMENT INDEXED TO 2010 BY SECTOR

	2010	2011	2012	2013	2014	2015	2016
Corporate & regional offices	100	104	122	121	126	133	133
Healthcare & social assistance	100	104	108	114	116	121	124
Lodging, restaurants, & bars	100	104	110	113	117	121	123
Wholesale trade	100	104	106	111	115	121	123
Arts, entertainment, & recreation	100	97	101	109	123	121	123
Construction	100	100	103	107	111	116	122
Transportation & warehousing	100	102	102	101	105	115	121
Administrative & support services	100	109	116	119	123	118	117
Personal & other services	100	103	108	114	114	115	115
Agriculture & forestry	100	102	102	115	111	116	114
TOTAL	100	102	105	108	110	112	114
Retail trade	100	100	101	104	108	112	113
Property sales & leasing	100	99	101	103	106	110	111
Utilities	100	102	107	103	107	104	108
Educational services	100	101	100	103	104	106	107
Professional services	100	101	103	103	104	106	107
Manufacturing	100	101	103	109	110	108	105
Oil, gas, & mining	100	104	120	117	128	120	105
Local government	100	99	99	100	101	103	103
Federal government (civilian)	100	99	100	102	97	97	98
Finance & insurance	100	103	105	105	100	94	96
State government	100	100	95	93	91	87	87
Information	100	98	94	94	90	85	84

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

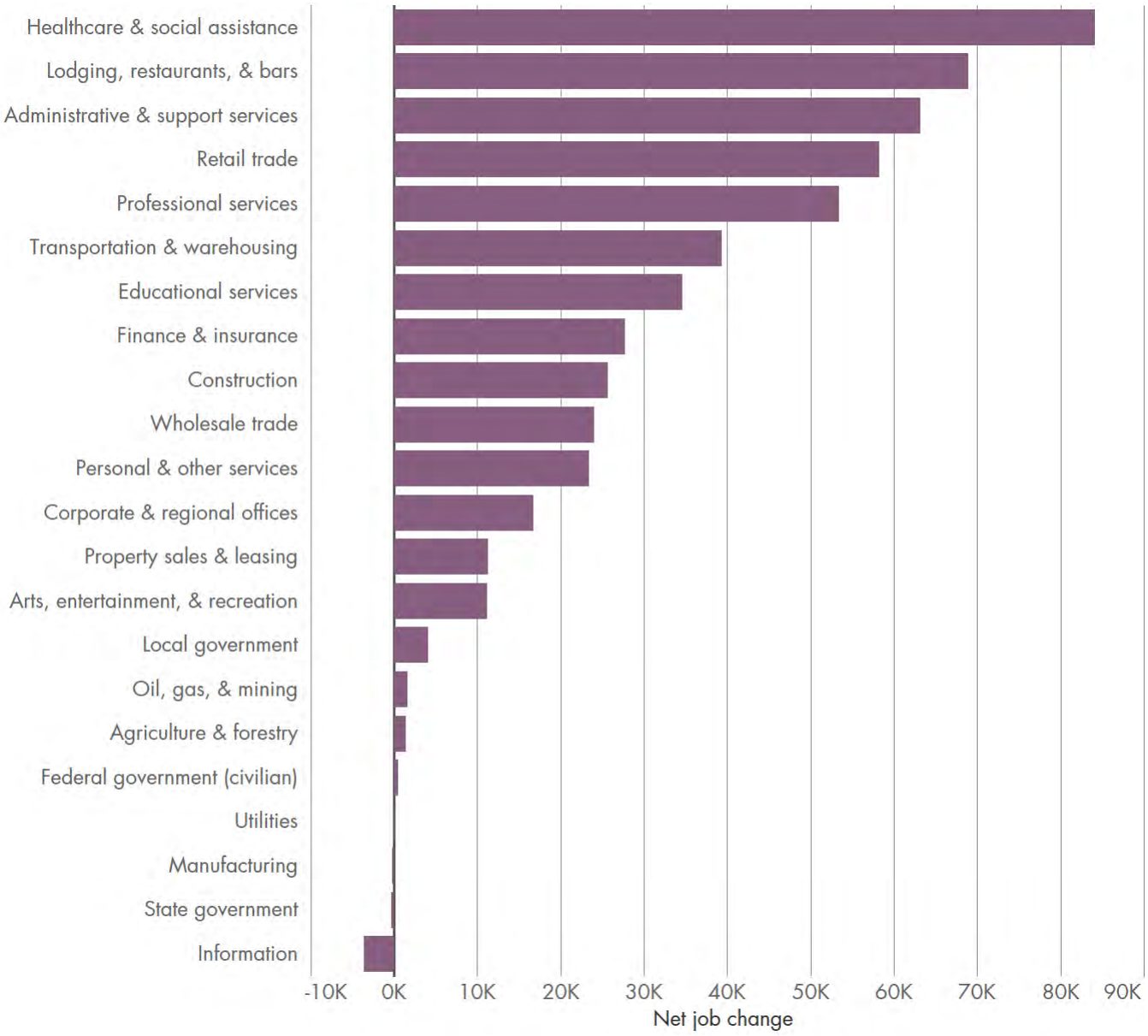
Some of the patterns of employment growth in 2010–2016, underscored in Figures 49-55 on the previous pages, can be further illustrated by looking at the current (2016) composition of total jobs in the Dallas-Fort Worth MSA (Figure 56). In many sectors, the balance of jobs between the metropolitan divisions is roughly on par with overall employment. The Fort Worth MD accounts for roughly 30 percent of all jobs in the Dallas-Fort Worth metro area—nearly 1.1 million jobs—compared with roughly 2.6 million jobs in the Dallas MD, or about 70 percent of the metro area's total employment. The divergence is mostly in the office-using sectors like professional services (where the Fort Worth MD captures just 17 percent of the metro area's jobs), finance & insurance (21 percent), information (15 percent), and corporate & regional offices (14 percent). The subsequent charts (Figures 57- 58) reiterate how job growth in the metro area overall (Figure 57) has been split between the two metropolitan divisions (Figure 58).

FIGURE 56. 2016 EMPLOYMENT BY SECTOR IN THE DALLAS-FORT WORTH MSA (BY METRO DIVISION)



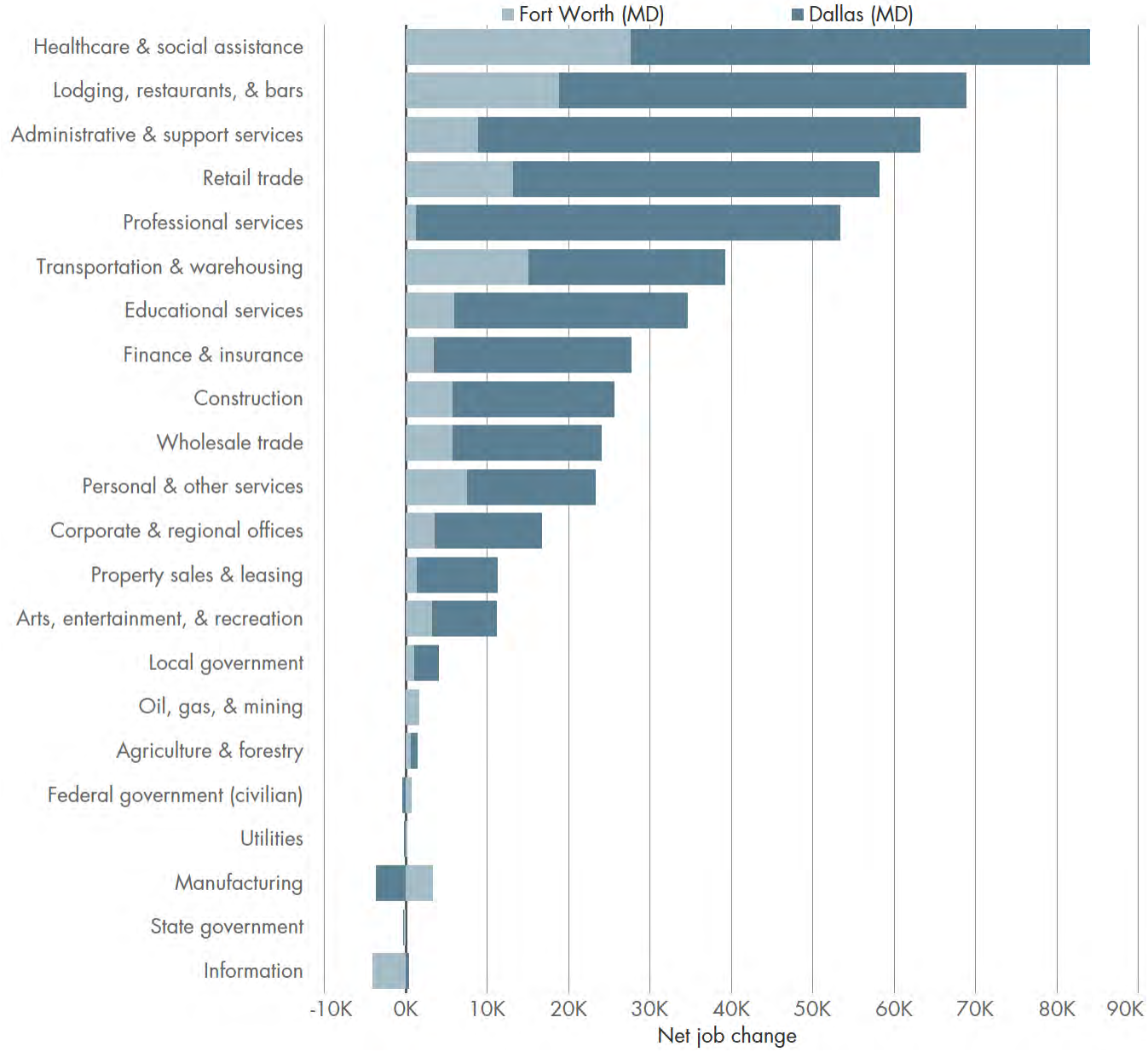
Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 57. NET CHANGE IN EMPLOYMENT BY SECTOR IN THE DALLAS-FORT WORTH MSA, 2010–2016



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 58. NET CHANGE IN EMPLOYMENT BY SECTOR IN THE DALLAS-FORT WORTH MSA (BY METRO DIVISION), 2010–2016

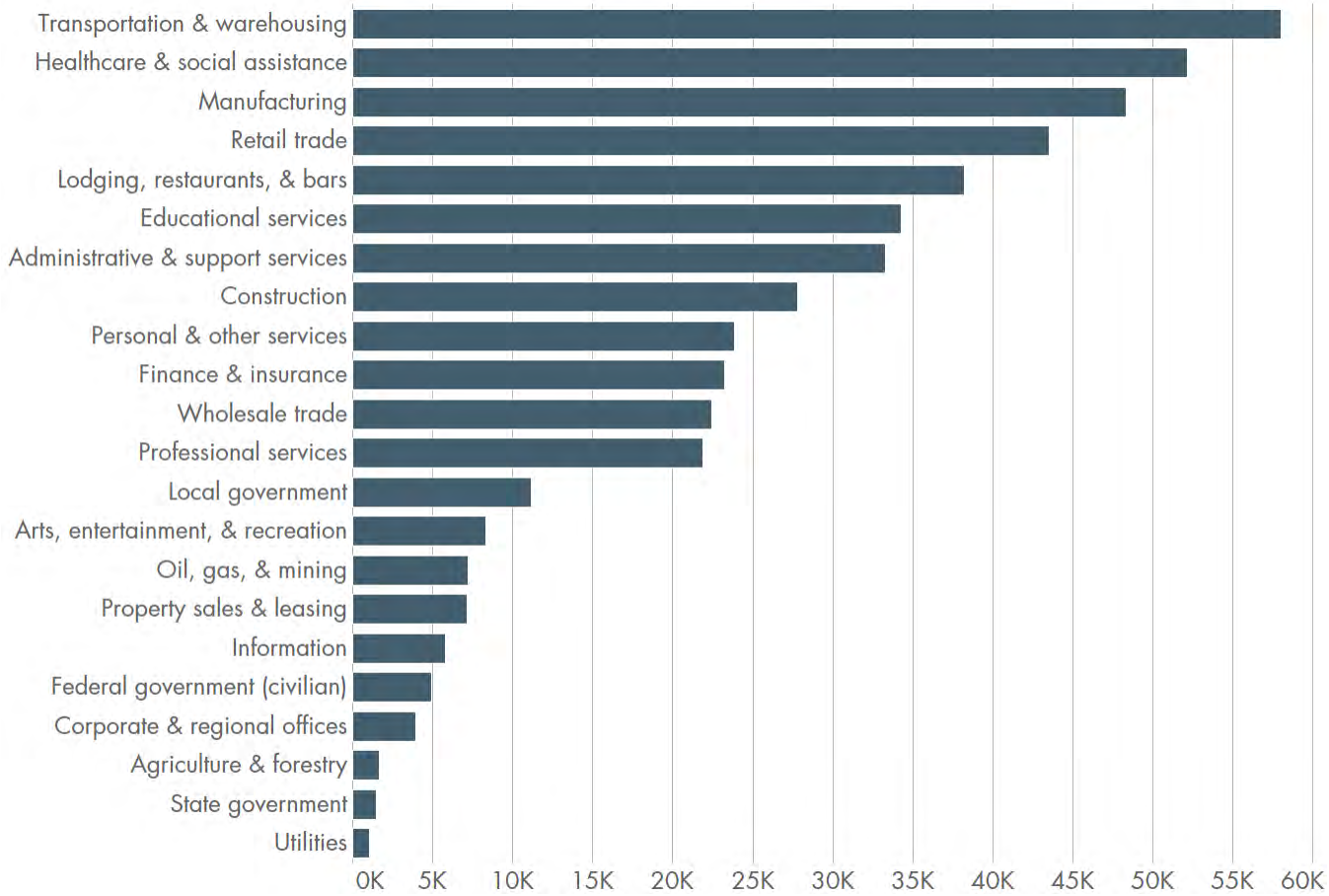


Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

Figures 49-58 helped set the context for national, state, and metropolitan employment growth patterns. Figures 59-61 drill into growth patterns in the city of Fort Worth. It is worth noting that these figures represent numbers rarely seen at the municipal level. Most city-level employment numbers released by statistical agencies are based on a household survey, i.e., where they *live*, not where they *work*. Familiar figures like labor force and unemployment rates derive from this survey, but city-level data is less often shown for employment sectors, which are more easily tied to workplace rather than residence. Surveys and administrative estimates at the establishment (workplace) level are typically not released at the city level. For the following analysis, TIP used an aggregation of ZIP-code level employment estimates produced by Emsi, a workforce data specialist. Our aggregation of ZIP codes approximates Fort Worth's municipal boundaries. Readers should keep in mind that these are estimates. Yet, the numbers reflected in these estimates seem to corroborate the findings of our overall assessment of comprehensive quantitative and qualitative sources.

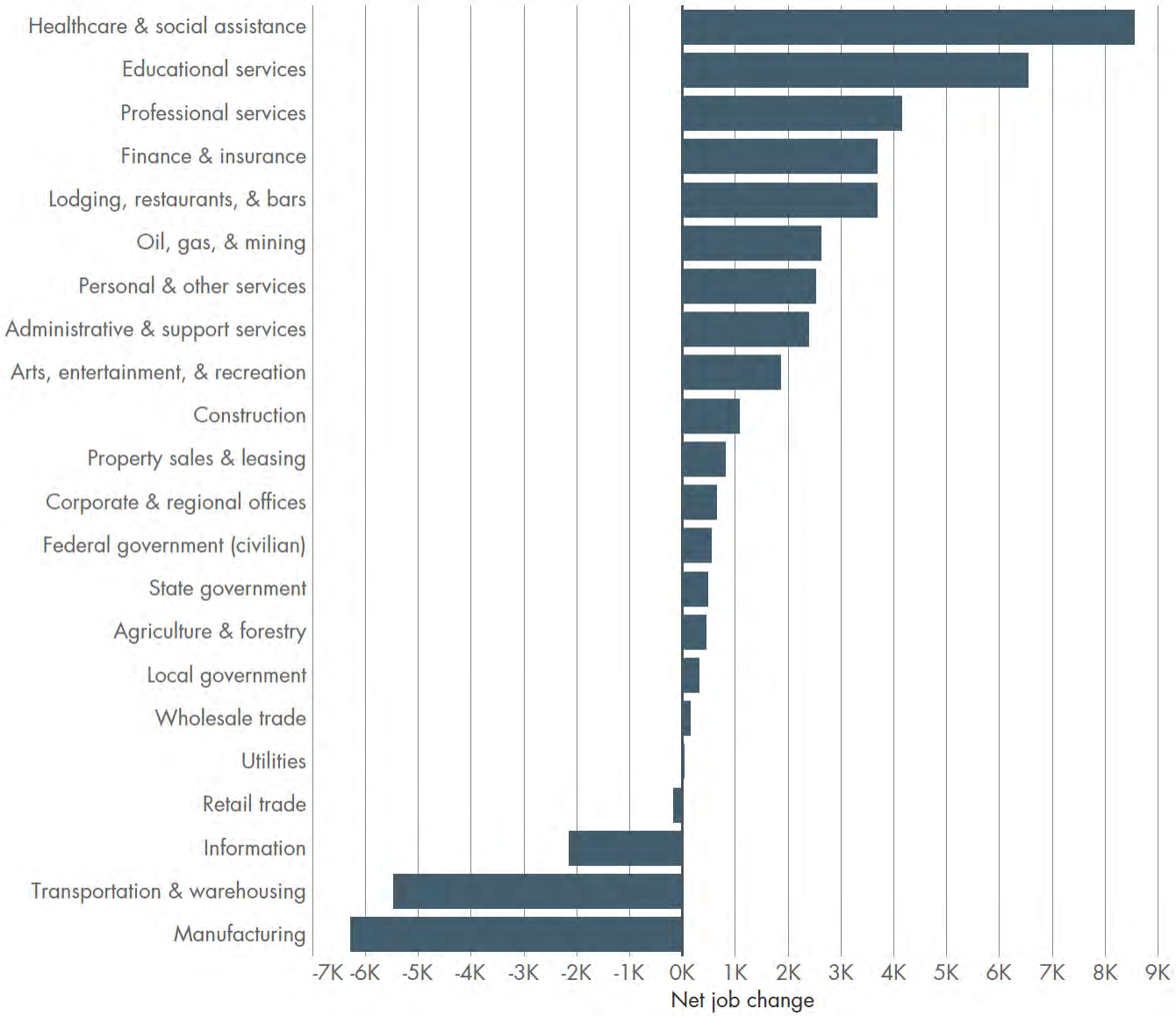
The city's top employing sectors as of 2016 were transportation & warehousing, healthcare, and manufacturing. In the previous economic cycle, 2001–2009, the period from the dot-com boom up to and including the Great Recession of 2008/2009, the employment sectors adding the most jobs in the city were healthcare and education. Interestingly, these were followed by office-using sectors like professional services and finance & insurance. In the current economic cycle, 2010–2016, healthcare continued to add the most jobs, but this time, it was closely followed by transportation & warehousing. Job gains in education and professional services have slipped far down the list of sectors, while finance & insurance employment in the city declined by 4 percent during the most recent six-year period.

FIGURE 59. 2016 EMPLOYMENT BY SECTOR IN THE CITY OF FORT WORTH



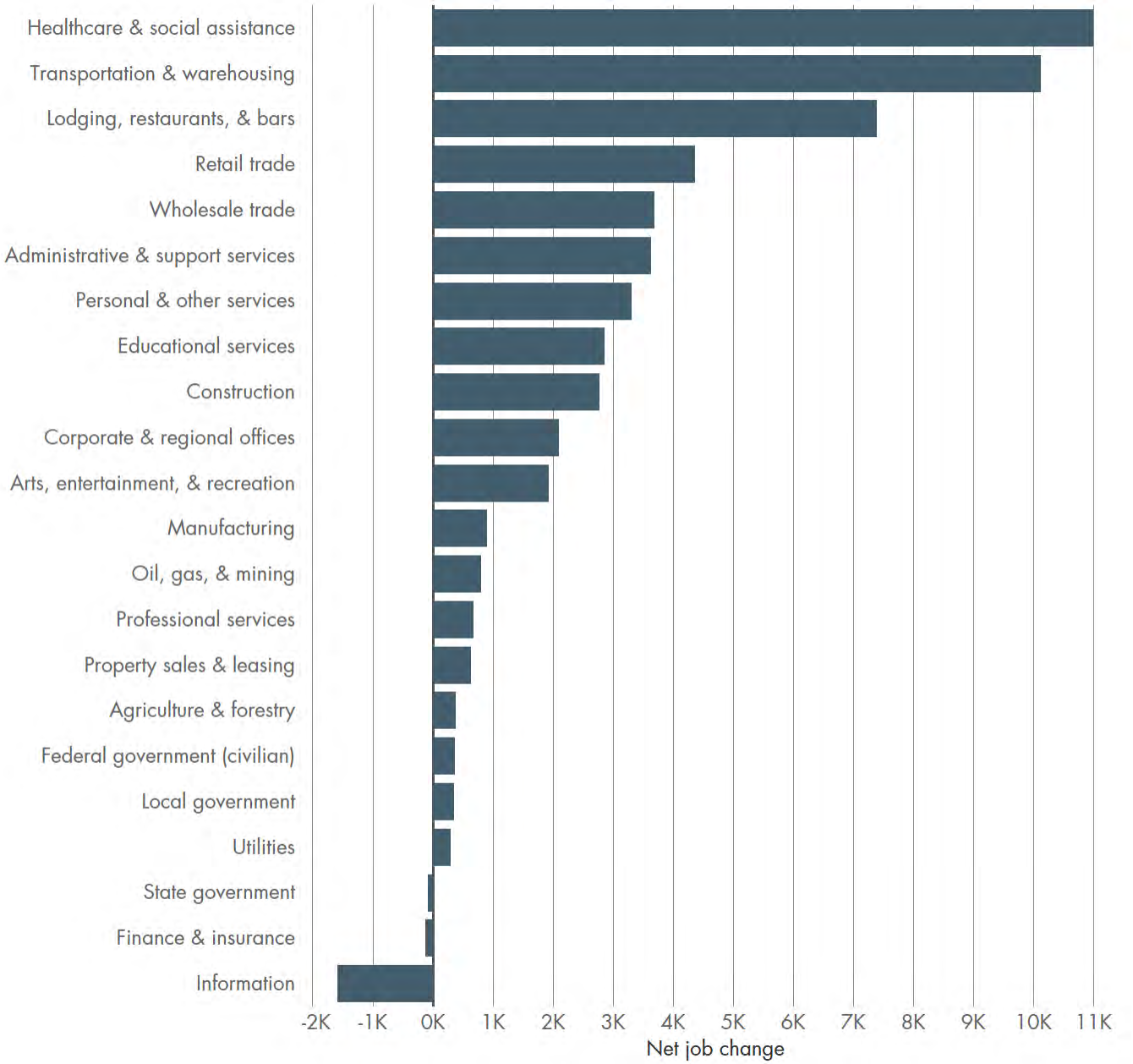
Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 60. NET CHANGE IN CITY OF FORT WORTH EMPLOYMENT BY SECTOR, 2001-2009



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

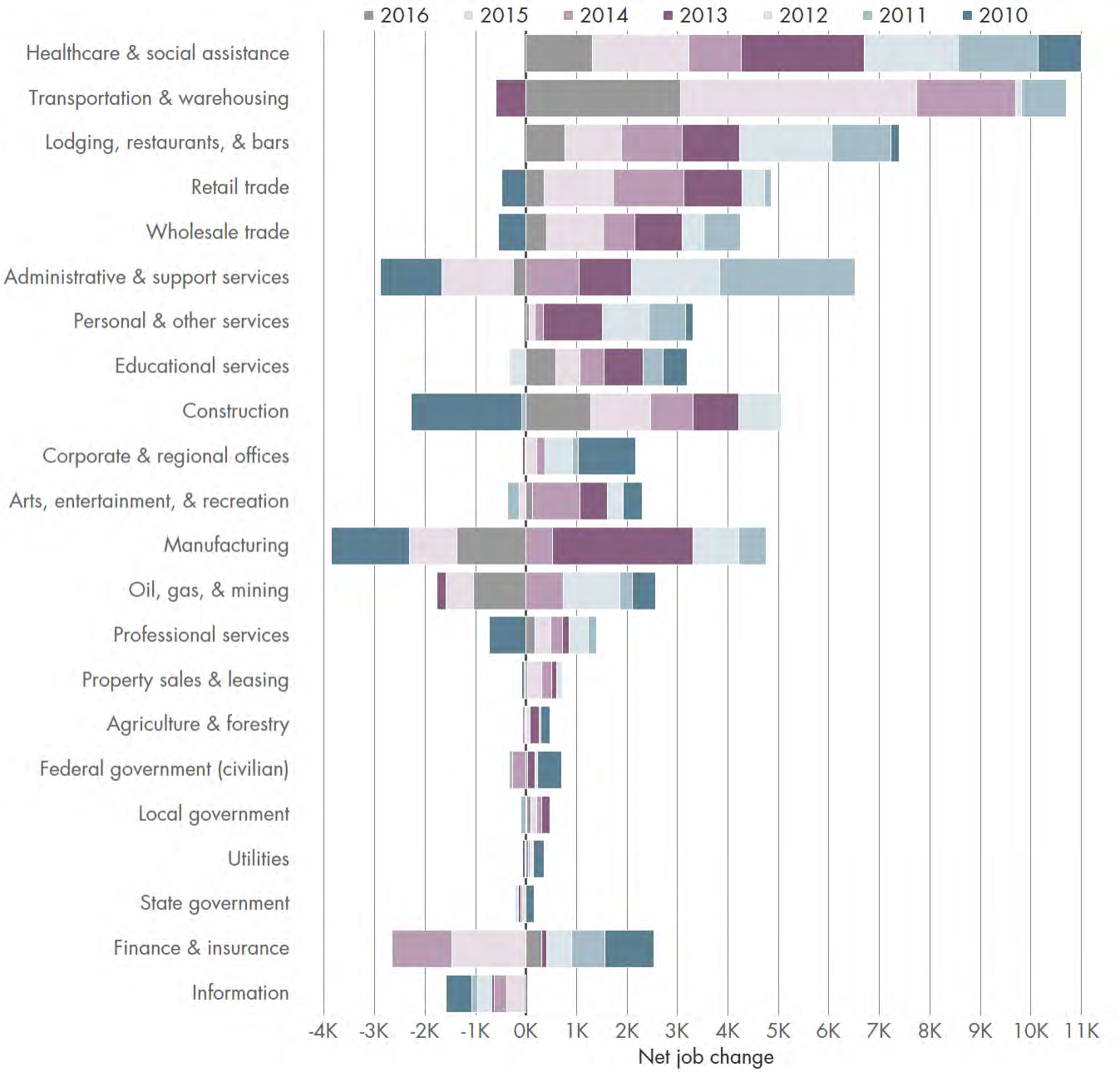
FIGURE 61. NET CHANGE IN CITY OF FORT WORTH EMPLOYMENT BY SECTOR, 2010-2016



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

Figure 62, is the same as Figure 61 (on the previous page) but with the annual job changes broken out year by year. What becomes apparent from this chart is a national pattern that is clearly echoed in Fort Worth. Some sectors, like healthcare, tend to be relatively stable, incremental performers. Healthcare has added jobs in each of the past six years. Other sectors, like construction and manufacturing, are more volatile. They can have good years when conditions are right, but bleed jobs quickly when things change. Figure 62 illustrates how these patterns of stability and volatility have played out across the sectors of Fort Worth's economy.

FIGURE 62. NET CHANGE IN CITY OF FORT WORTH EMPLOYMENT BY SECTOR AND YEAR, 2010-2016

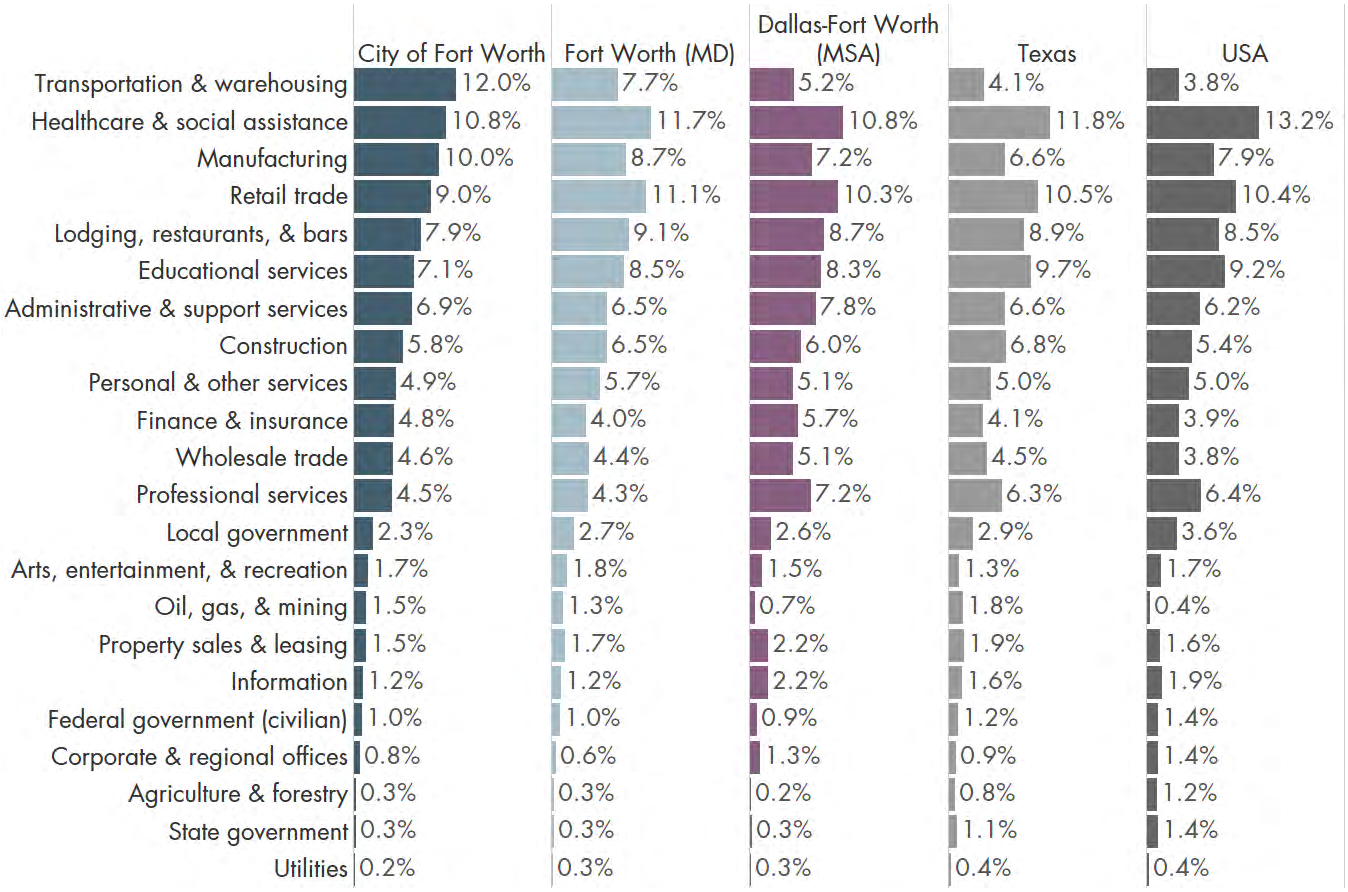


Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

Figures 63-64 depict the economic sectors in two ways. Figure 63 is the more straightforward view. It shows composition of employment (i.e., which sectors are bigger and which ones are smaller in terms of jobs.) Figure 64 goes one step farther. It uses a concept called location quotients (LQs) to show how a local economy's strengths and weaknesses compare to the US. (See LQ description, next page.) Because location quotients measure proportional differences across geographic levels, they do not reflect sector sizes. That's why it's important to view Figures 63 & 64 together. In the pair of figures, we see the city of Fort Worth, the Fort Worth MD, the Dallas-Fort Worth MSA, Texas, and the US in parallel columns.

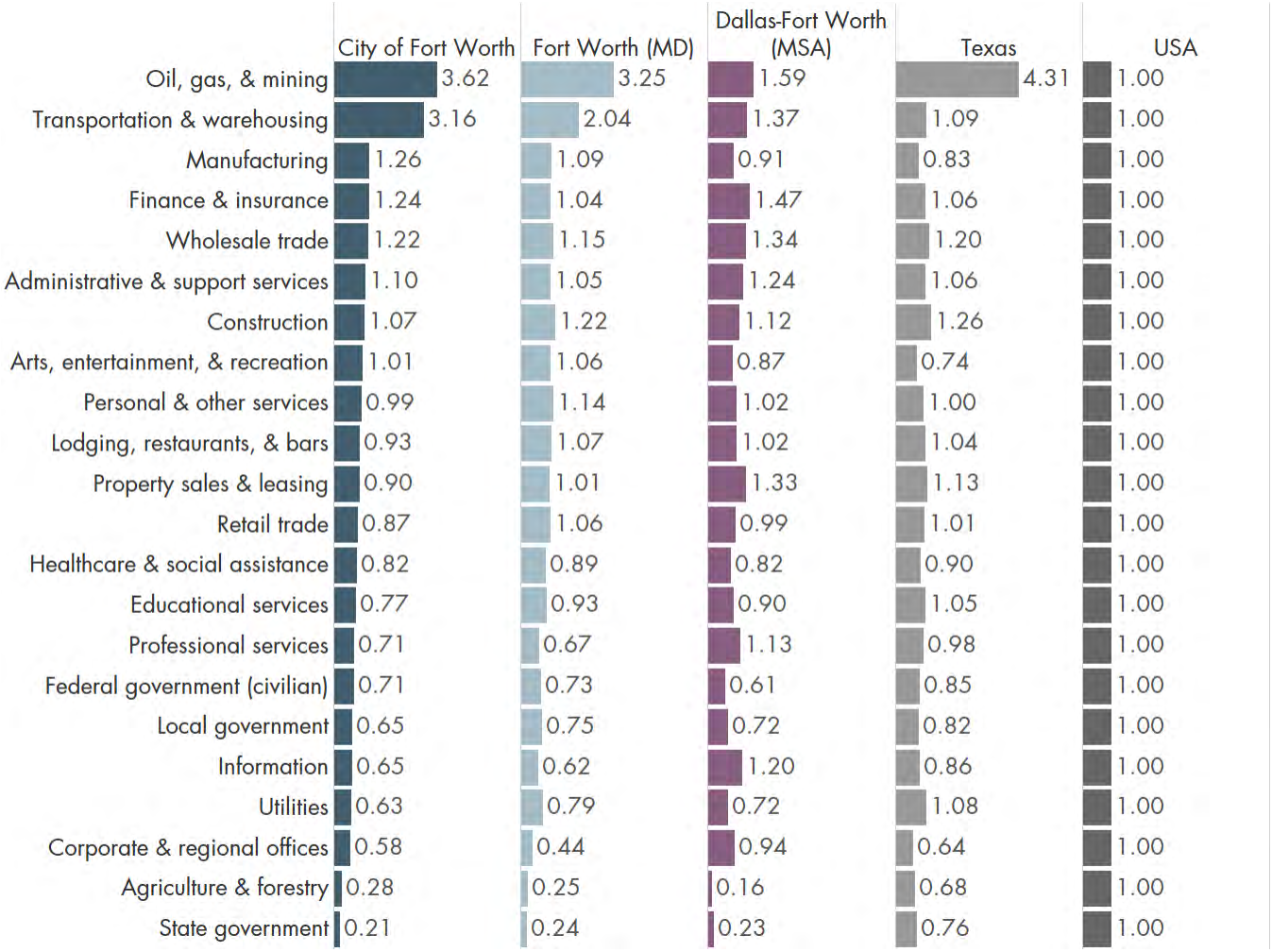
As a rule of thumb, LQs between 0.80 and 1.20, tend to fall within the zone of "near-average." There can certainly be exceptions to this gray guideline, but in general, large (or potentially large) employment sectors that fall outside these bounds can draw more scrutiny. With that as our starting point, Fort Worth's strengths in 2016 were in the (relatively small) sector of oil, gas, & mining and the (relatively large) sector of transportation & warehousing. One of eight jobs in the city is in transportation & warehousing compared to fewer than 2 percent in oil, gas, & mining. The LQs also highlight the city's dilemma with professional services employment in particular. The city's LQ (0.71) is relatively low, even though the Dallas-Fort Worth metro area (1.13) is well above the national and state averages. The professional services sector employs 6.4 percent of the nation's workers (nearly twice as many as transportation & warehousing nationwide), and professional services represents 7.2 percent of Metro area employment. In the city of Fort Worth, it is just 4.5 percent.

FIGURE 63. SECTOR SHARE (%) OF 2016 TOTAL EMPLOYMENT



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 64. 2016 COMPARATIVE LOCATION QUOTIENTS (LQs) BY SECTOR



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

ABOUT LOCATION QUOTIENTS (LQS)

Location quotient analysis is a statistical technique used to suggest areas of relative advantage based on a region's employment base. LQs are calculated as an industry's share of total local employment divided by the same industry's share of employment at the national level:

$$\frac{\textit{(local employment in industry/}}{\textit{total local employment -all industries)}}$$

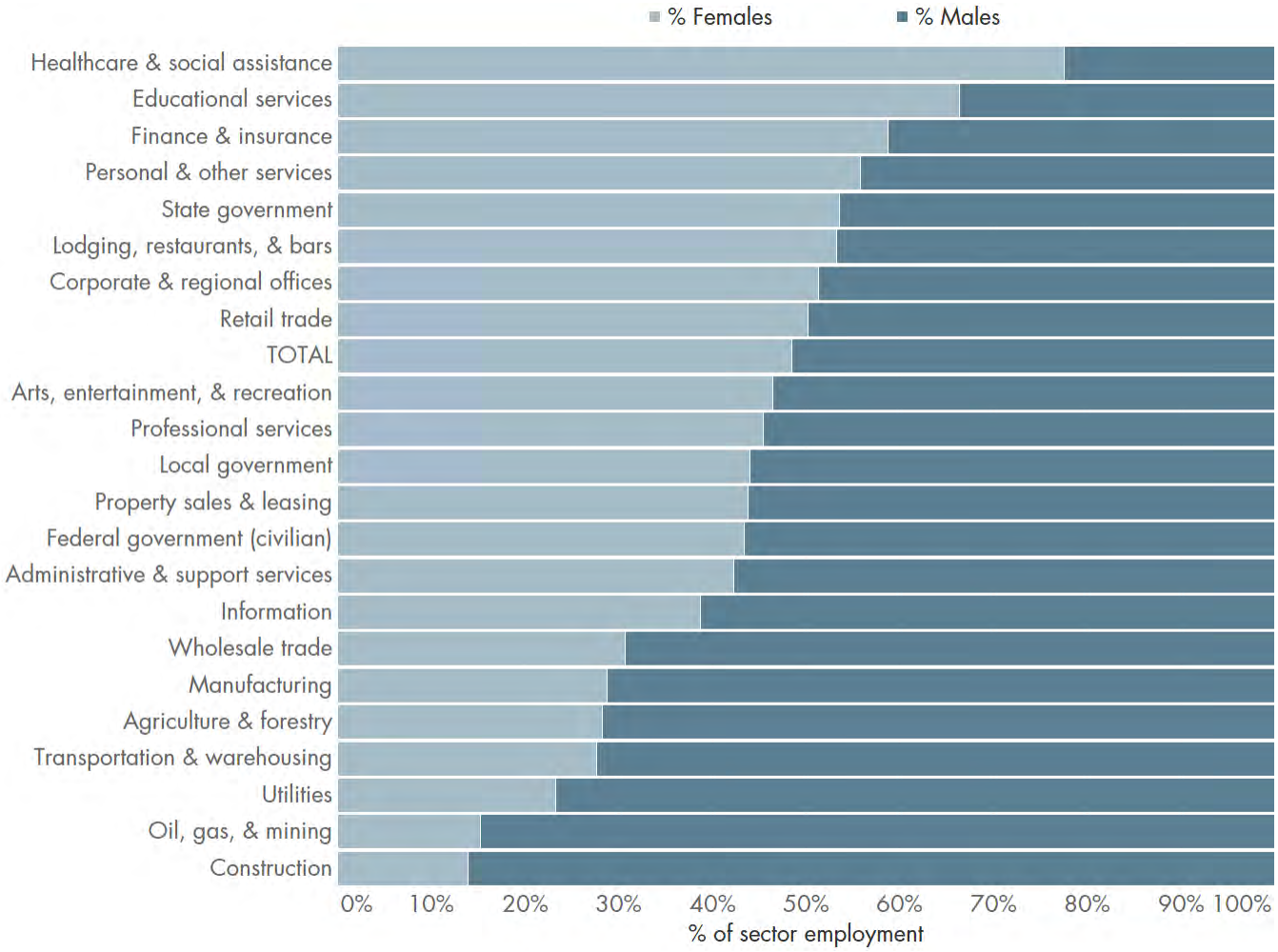
$$\textit{(national employment in industry/ total national employment-all industries)}$$

If the local industry and national industry are perfectly proportional, the LQ will be 1.00. LQs greater than 1.25 are presumed to indicate a comparative advantage; those below 0.75 suggest areas of weakness but also point to opportunities for expansion or attraction.

Figures 65-68 show the demographics of employment by sector in 2016. Figures 65-66 focus on gender and show the male/female split of employment in each sector, first for the US (Figure 65) and then for the Fort Worth MD (Figure 66). Figures 67-68 follow a similar logic, but instead focus on age and show the age cohort distribution of employment in each sector, first for the US (Figure 67) and then for the Fort Worth MD (Figure 68). We focus on the Fort Worth MD in these exhibits because workforce demographics data are not available at the municipal employment level.

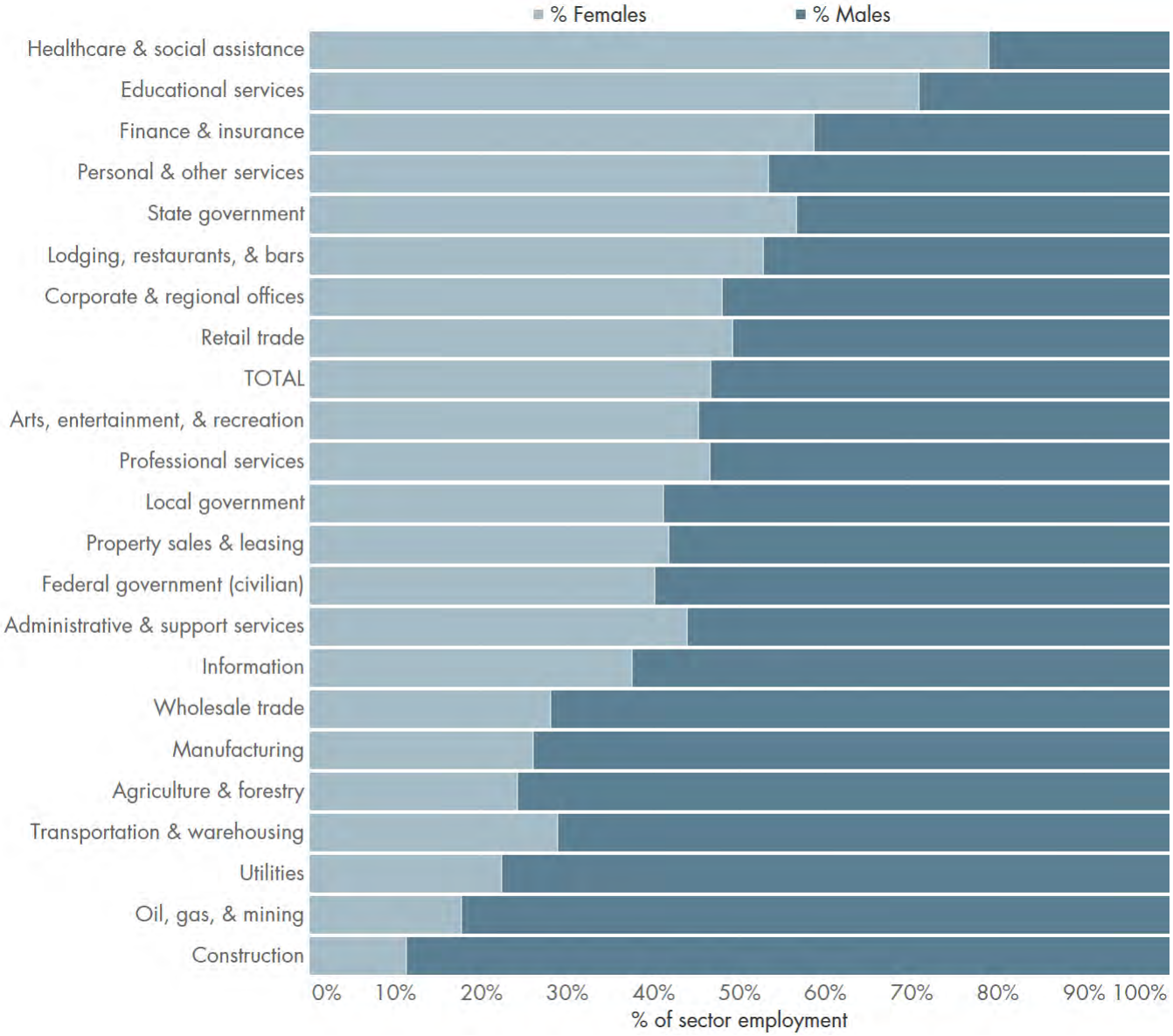
The distribution of jobs across genders is relatively similar in Fort Worth to national patterns. These patterns rarely differ geographically. The importance here is understanding the outliers—which sectors employ more women and which ones employ more men—and reconciling those patterns with your local employment. In Fort Worth's case, this is important. The MD has relative strengths (as measured by LQs) in sectors that lean toward male employees. These include transportation & warehousing, manufacturing, oil, gas, & mining, and construction. Sectors like healthcare and education, both with strong ratios of female employment, tend to have below-average LQs in Fort Worth. It does raise the question of how this disparity could potentially impact the inbound and outbound commuting patterns between the Fort Worth and Dallas metropolitan divisions.

FIGURE 65. 2016 GENDER DISTRIBUTION
US EMPLOYMENT BY SECTOR



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 66. 2016 GENDER DISTRIBUTION
FORT WORTH (MD) EMPLOYMENT BY SECTOR

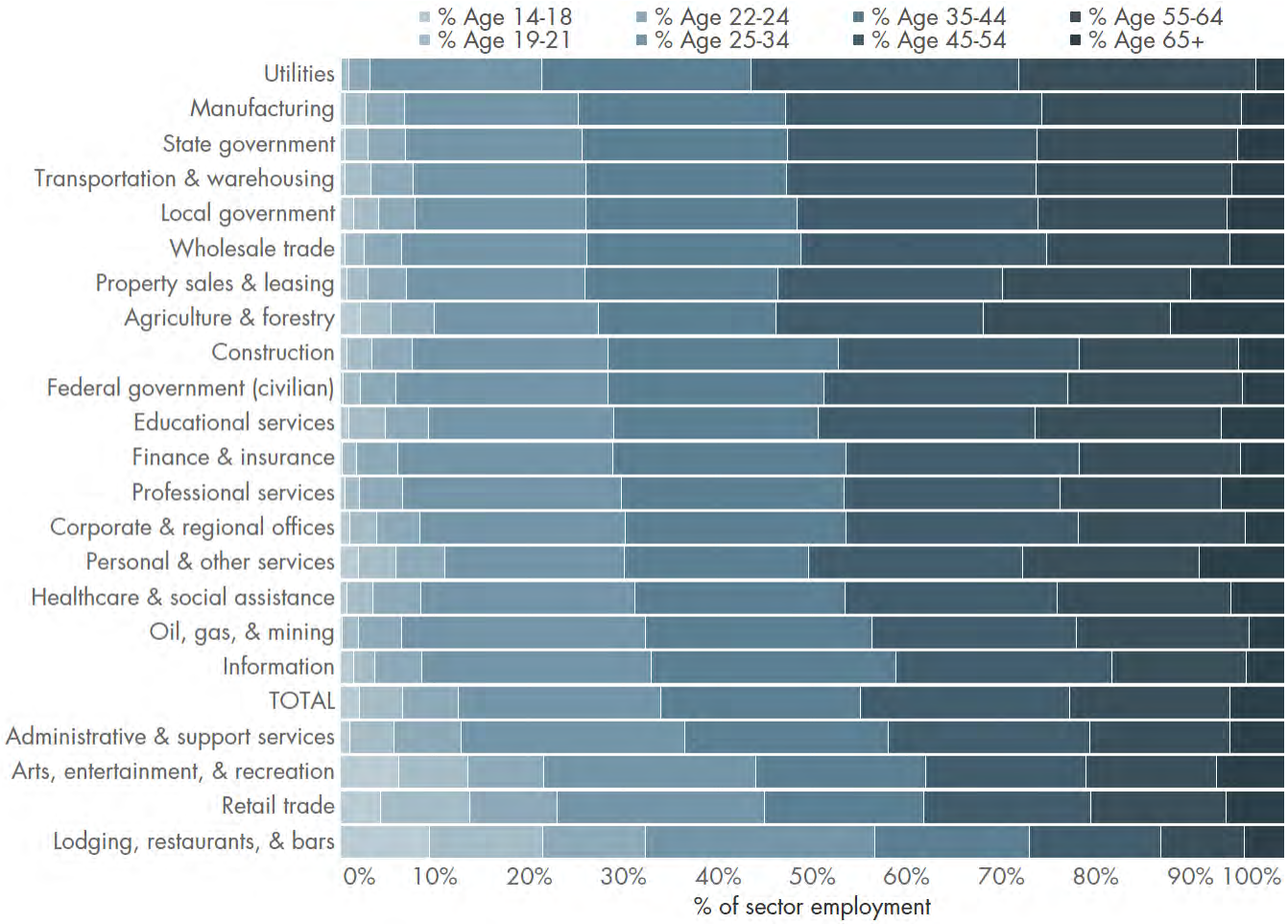


Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

In Figures 67-68, we turn to the age distribution of employment. The Fort Worth MD's patterns look quite similar to the US, but again, age patterns do not typically diverge a great deal geographically. What is more important is a full understanding of the local area's employment strengths and weaknesses and how this may impact workforce pressures in the future. Age composition of most sectors is completely logical. As an example, think about the sectors in Figure 68 with younger age structures such as lodging, restaurants, & bars and arts, entertainment, & recreation. Whether it's a waitress at Joe T. Garcia's or a front desk agent at the downtown Fort Worth Omni Hotel, these types of service jobs tend to draw younger workers who may move on to something else later in their professional lives. From an employer's perspective, it may be more helpful for local government initiatives to focus on the sectors that disproportionately employ older workers—the types of jobs likely to see large waves of retirements in the next 10 or 20 years—especially when these jobs involve special skills that employers find difficult to replace.

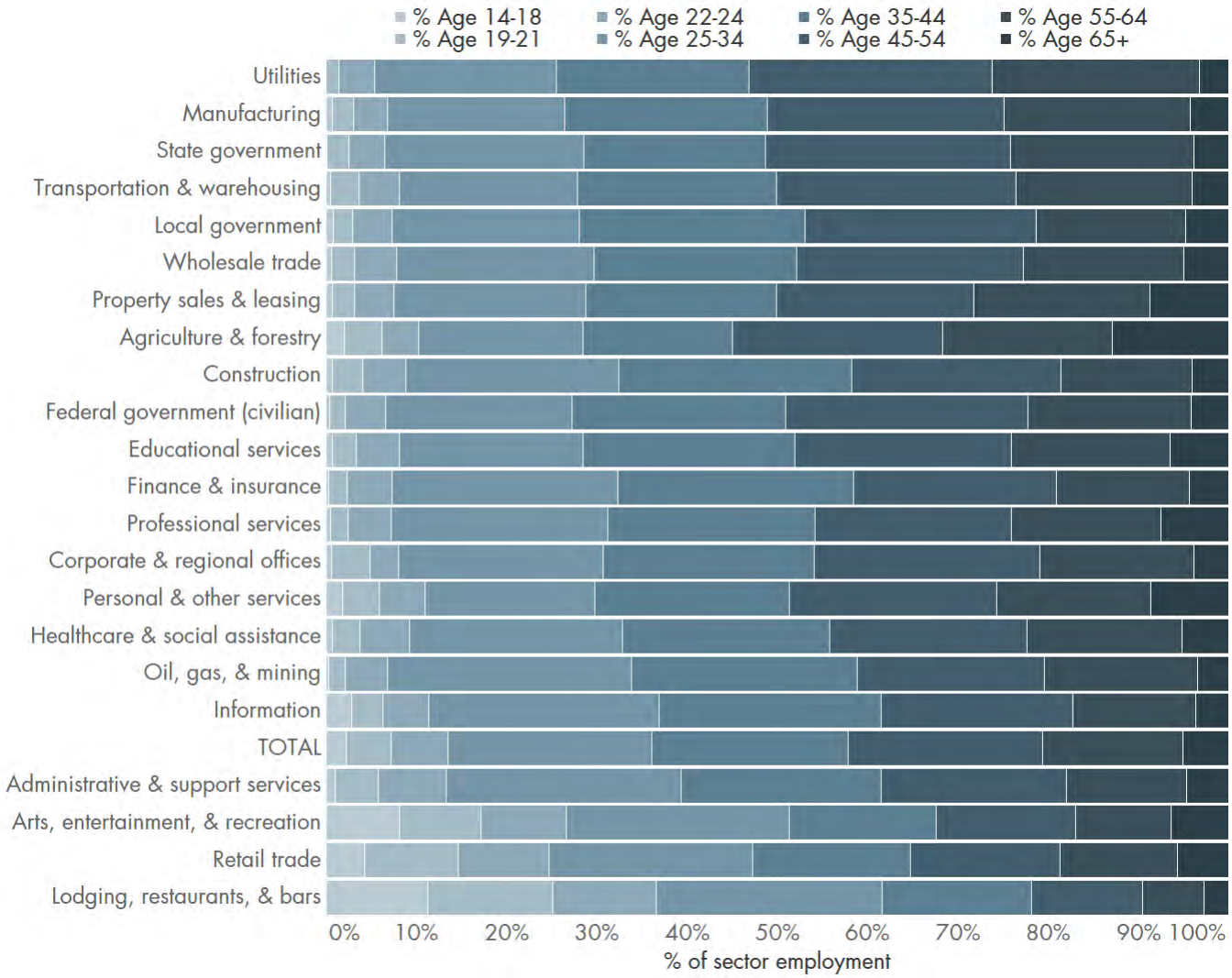
The differences in age structures across sectors are stark, as Figures 67-68 show. Nationwide, more than half the workers in hotels, restaurants, and bars are under the age of 35, whereas in sectors like manufacturing and transportation & warehousing, more than half of workers are over the age of 45. In Fort Worth's case, the relatively large transportation & warehousing and manufacturing sectors may be among the sectors the metro area needs to place on its "watch" list. In other words, it will be important for Fort Worth's economic and workforce development partners to pay close attention to the special needs of employers in these sectors as their workforces near retirement.

FIGURE 67. 2016 AGE DISTRIBUTION OF US EMPLOYMENT BY SECTOR



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 68. 2016 AGE DISTRIBUTION OF FORT WORTH METRO DIVISION EMPLOYMENT BY SECTOR

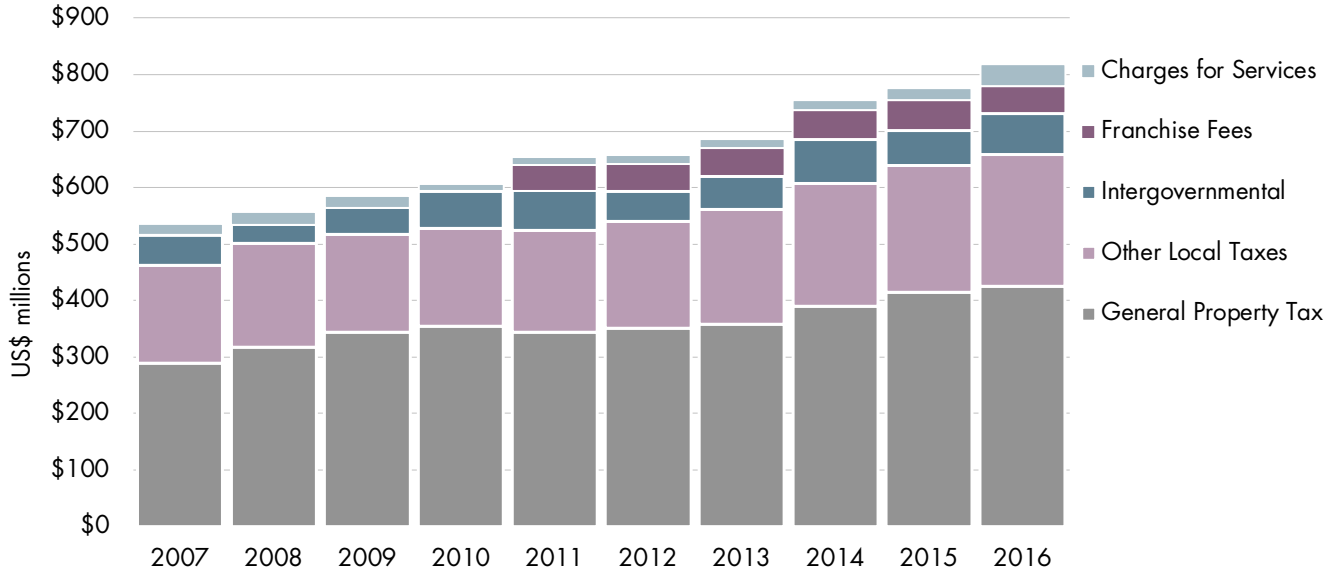


Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

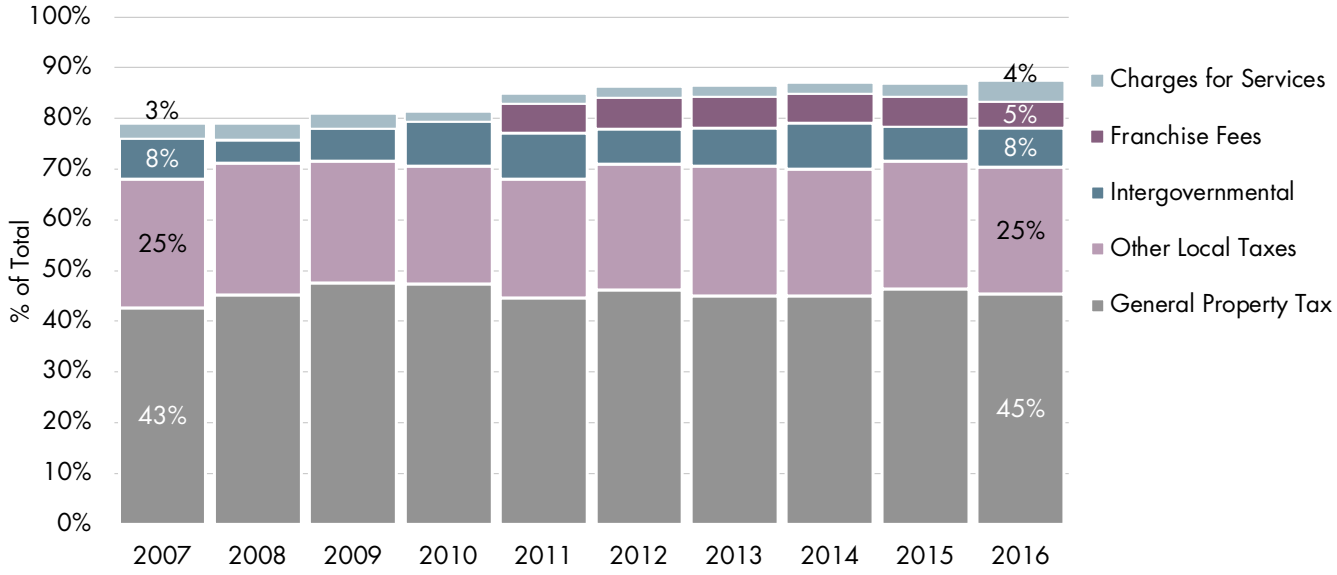
6. FISCAL LANDSCAPE

Each of the city of Fort Worth's top five sources of revenue has grown significantly over the past decade in absolute levels, but so has the city's population. In percentage terms, general property taxes and other local taxes (including sales and use taxes) have consistently accounted for about two-thirds of municipal revenues. The 10-year landscape of municipal revenues, *at a cursory level*, raises no red flags or immediate concerns about revenue problems.

FIGURE 69. TOP 5 REVENUE SOURCES FOR THE CITY OF FORT WORTH
BALANCE AT FISCAL YEAR END



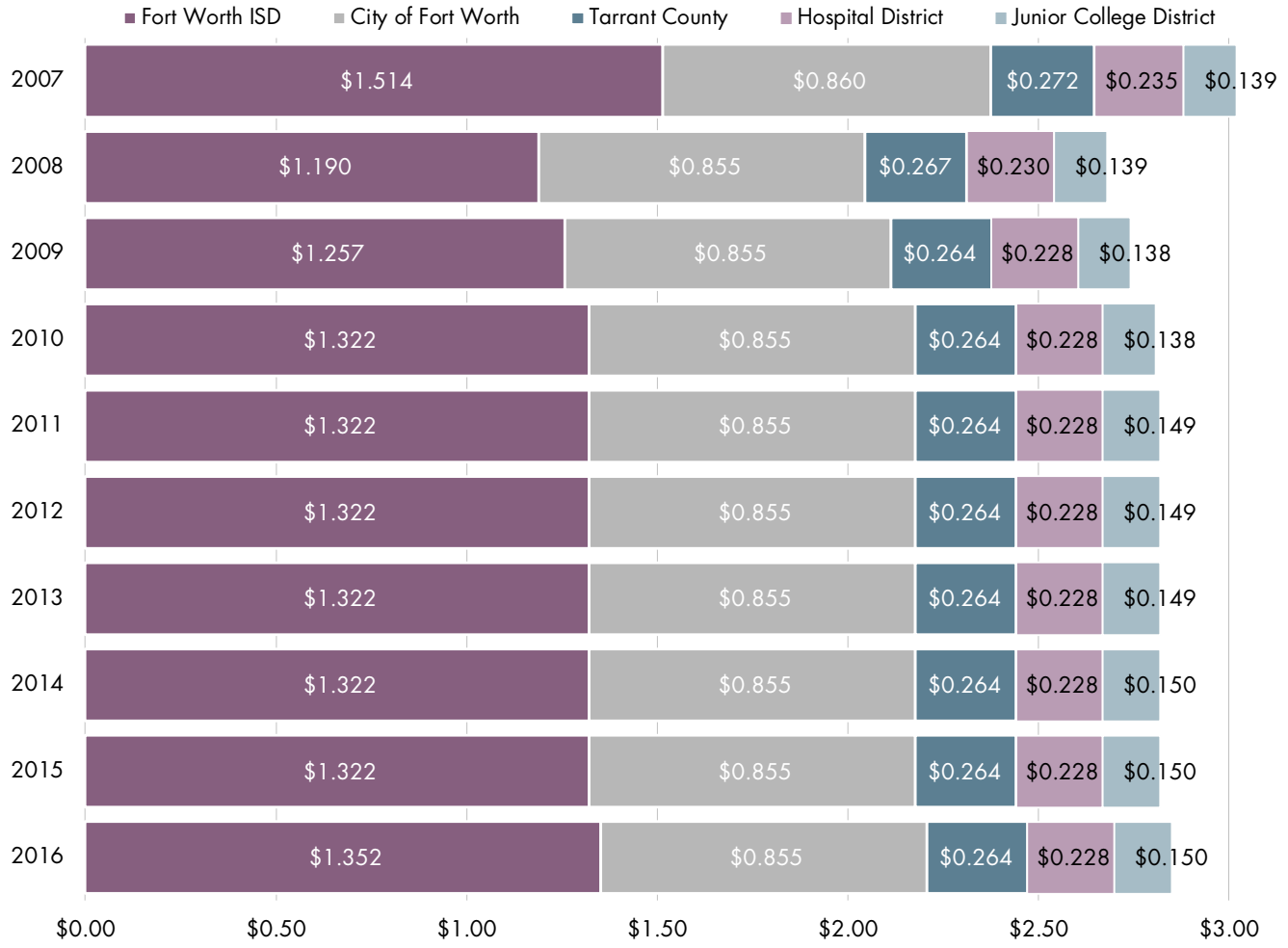
PERCENT OF TOTAL AT FISCAL YEAR END



Source: City of Fort Worth, Comprehensive Annual Financial Report, FY 2016, pp. 190-191.

Similar to taxing jurisdictions across Texas, the total property tax rate (composed of taxes paid by the city, county, school district, and special districts) is driven primarily by its largest component—the school district. This holds true in Fort Worth. In the past 10 years, the city's rate has changed only once but the ISD's rate has changed four times, with a clear impact on annual property tax totals (Figure 70).

FIGURE 70. ALLOCATION OF THE LOCAL PROPERTY TAX IN RECENT YEARS
TAX RATES OF MAJOR OVERLAPPING JURISDICTIONS



Sources: Tarrant County Appraisal District; City of Fort Worth, Comprehensive Annual Financial Report, FY 2016, p.195.
Note: Rates applied per $100 of assessed valuation.

Figure 71 is drawn from information in the latest Tax & Debt Survey conducted annually by the Texas Municipal League (TML). In our peer review of metro area cities for this assessment, we focused on the cities in the MSA with populations of 100,000 or more. Four are missing from this exhibit (Dallas, Frisco, Garland, and Mesquite) because they did not respond to or were otherwise not included in this year's TML survey.

Fort Worth's per capita property tax revenues (in column 5) are roughly in line with the MSA average as is debt per capita (column 7). However, per capita property valuations (column 4) fall below average, implying potential for upward growth. But first things first. Fort Worth's per capita property valuation calculated from the 2017 TML survey was $67,900. Why would Fort Worth's per capita valuation's fall so far below other cities in the survey like Plano, Richardson, McKinney, Allen (all of which were over $100,000?) and even Irving, Carrollton, Lewisville (which were above $80,000)? To delve into this question further, we explore some issues of land use choices in Sections 5 and 7 of this assessment.

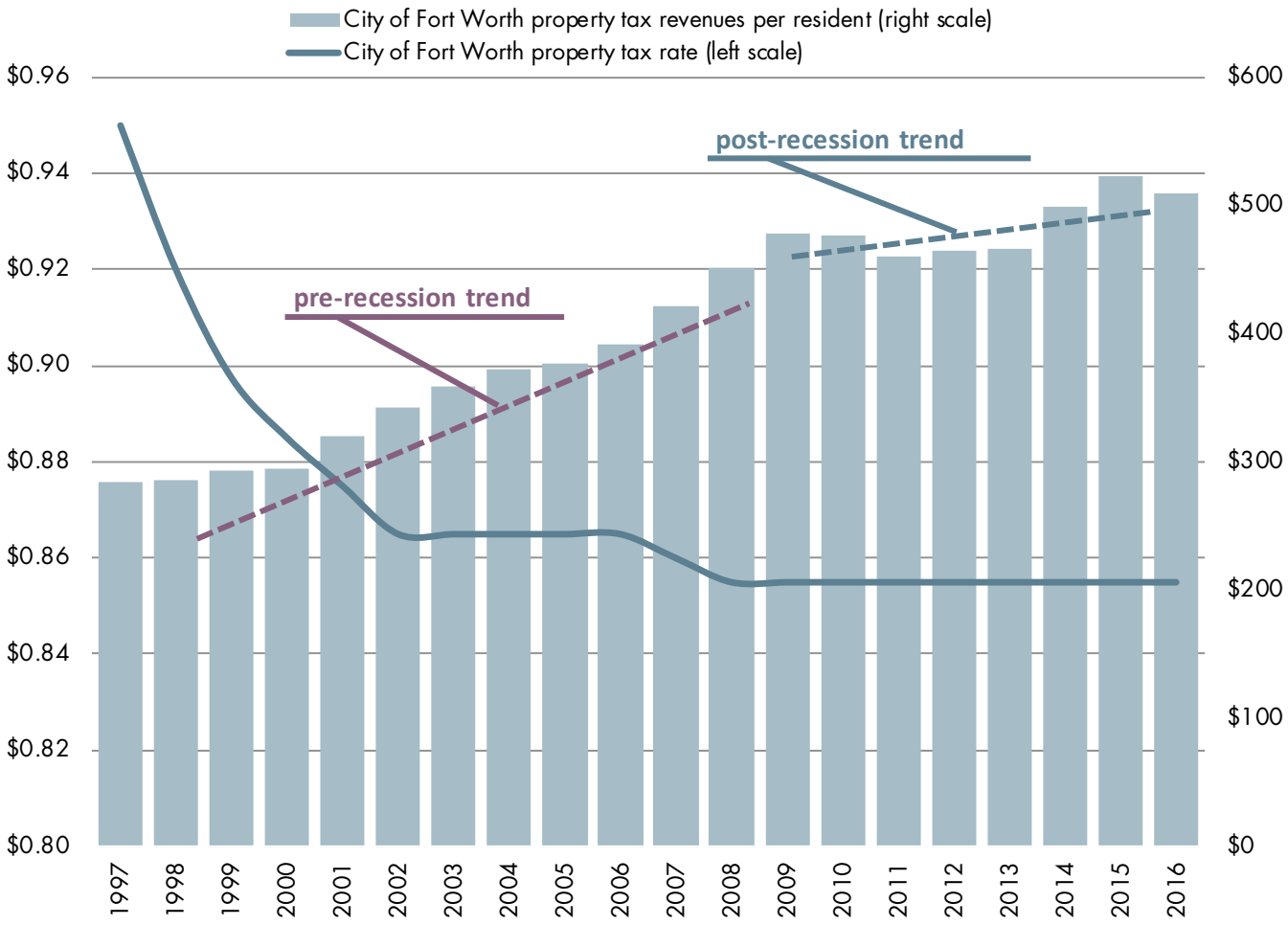
FIGURE 71. MUNICIPAL PROPERTY TAX & DEBT METRICS
METRO AREA CITIES WITH POPULATIONS OF 100,000+

*Of the 15 cities in this group, four (Dallas, Frisco, Mesquite, and Garland) did not respond to the 2017 survey).
Source: Texas Municipal League, 2017 Tax & Debt Survey.

The city's property tax rate fell precipitously in the late 1990s and early 2000s, but has since leveled off and maintained a relatively low, stable rate. A closer look at the city's property taxes shows that per-capita revenues generated from property were rising precipitously in the decade preceding the Great Recession. Property tax revenues in the post-recession years have been higher in per-capita terms than in the pre-recession years, but the average annual pace of growth is much smaller than in the pre-recession years. This is worth noting, since population growth in the pre-recession years was actually faster than in the following years. The city averaged just below 20,000 new residents per year between 1997 and 2008, raising the denominator in the per-capita revenue equation at a rapid pace. In the years since 2008, the average annual population growth has eased to just over 16,000 per year, still a steady stream of new residents, but with slightly less pressure on the denominator.

The implication is that the numerator (total property tax revenues) was growing at a slower pace from 2009 forward. This is not surprising given the realignment of housing values nationwide in the post-recession years. US cities that relied heavily on property taxes for revenues and were heavily zoned for single-family land uses were inevitably exposed to unexpected pressure on their revenues.

FIGURE 72. AVERAGE PROPERTY TAX REVENUE PER FORT WORTH RESIDENT
LONG-TERM TRENDS IN PROPERTY TAX RATES AND PER-CAPITA REVENUES

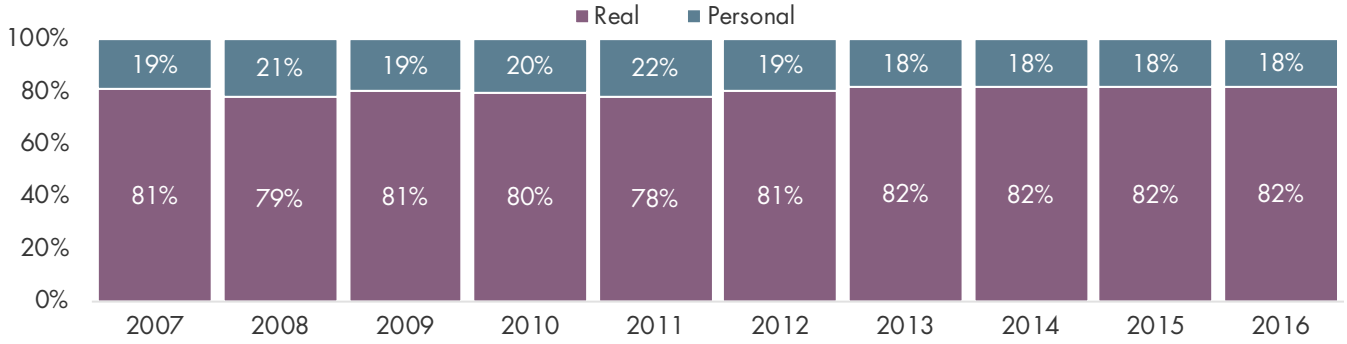


Source: City of Fort Worth, Comprehensive Annual Financial Report, FY 2016, pp. 197, 202-203.
Note: Rates applied per $100 of assessed valuation.

The split between revenues generated from real property versus personal property has changed little in the past decade. The split remains stable with about four dollars generated from real property for every dollar generated from personal property in the city of Fort Worth.

FIGURE 73. COMPOSITION OF TAXABLE PROPERTY

DISTRIBUTION REAL AND PERSONAL TAXABLE PROPERTY AS A SHARE OF TOTAL



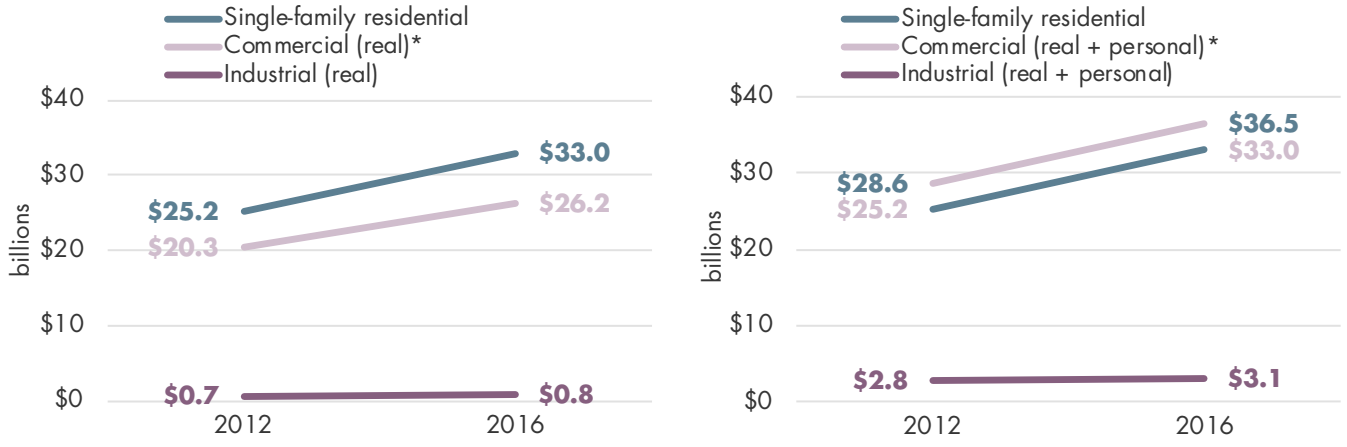
Source: City of Fort Worth, Comprehensive Annual Financial Report, FY 2016, pp. 214.

The appraisal value of single-family residential property in the city of Fort Worth ($33.0 billion) exceeded both real commercial property ($26.2 billion) and real industrial commercial property (less than $1.0 billion) in FY 2016. Real single-family residential property is valued only moderately more than real commercial property, despite covering a much larger share of the city's non-vacant land. When both real and personal commercial property are combined, the appraisal value rises to $36.5 billion, thus edging ahead of the single-family residential value of $33 billion. Increasing the value of the city's commercial and industrial property would enable the city to maintain and expand current service levels without increasing the tax burden on residents.

Even though industrial property represents a smaller share of the Fort Worth market, it is worth underscoring that the appraised value of the personal property associated with this land use in Fort Worth ($2.3 billion) is three times higher than the appraised value of the real property ($0.8 billion). The two components combined lifted industrial property's total appraised value in FY 2016 to $3.1 billion.

FIGURE 74. COMPOSITION OF APPRAISED PROPERTY VALUE

REAL AND PERSONAL PROPERTY VALUES BY LAND USE CATEGORY



*Commercial property includes multi-family residential.

Sources: Tarrant County Appraisal District; City of Fort Worth, Comprehensive Annual Financial Report, FY 2016, pp. 218.

Note: Analysis includes Tarrant County only (excludes city property crossing other county boundaries).

Over the last 10 years, Fort Worth has lessened its reliance on its major taxpayers as Figure 75 shows. In 2007, the 10 largest property tax bills together totaled $2.0 billion and represented 6.1 percent of the city's property assessments.

By 2016, the 10 largest property tax bills brought in even more revenue ($2.3 billion), but the top-10 taxpayers represented only 4.5 percent of all the city's assessments, thus easing the risk the city may inadvertently carry by relying heavily on a few large taxpayers.

FIGURE 75. MAJOR PROPERTY TAXPAYERS IN THE CITY OF FORT WORTH
OVERVIEW OF CHANGES FROM 2007 TO 2016

2016			
Taxpayer	**Industry**	**Taxes levied ($mil)**	**% of base**
Sundance Square	*Real estate*	$436.6	0.9%
TU Electric / Oncor	*Electric utility*	$391.6	0.8%
Bell Helicopter	*Aircraft manufacturing*	$382.4	0.8%
XTO Energy	*Oil & gas producer*	$229.5	0.5%
AMR / American Airlines	*Airline*	$182.3	0.4%
Alcon Laboratories	*Pharmaceuticals*	$175.4	0.4%
Chesapeake	*Natural gas producer*	$175.2	0.4%
Wal-Mart	*Retailer*	$166.8	0.3%
Cousins / F7 SSSM	*Real estate*	$148.3	0.3%
MillerCoors	*Brewer*	$147.1	0.3%
Top 10 taxpayers		**$2,435.18**	**4.9%**

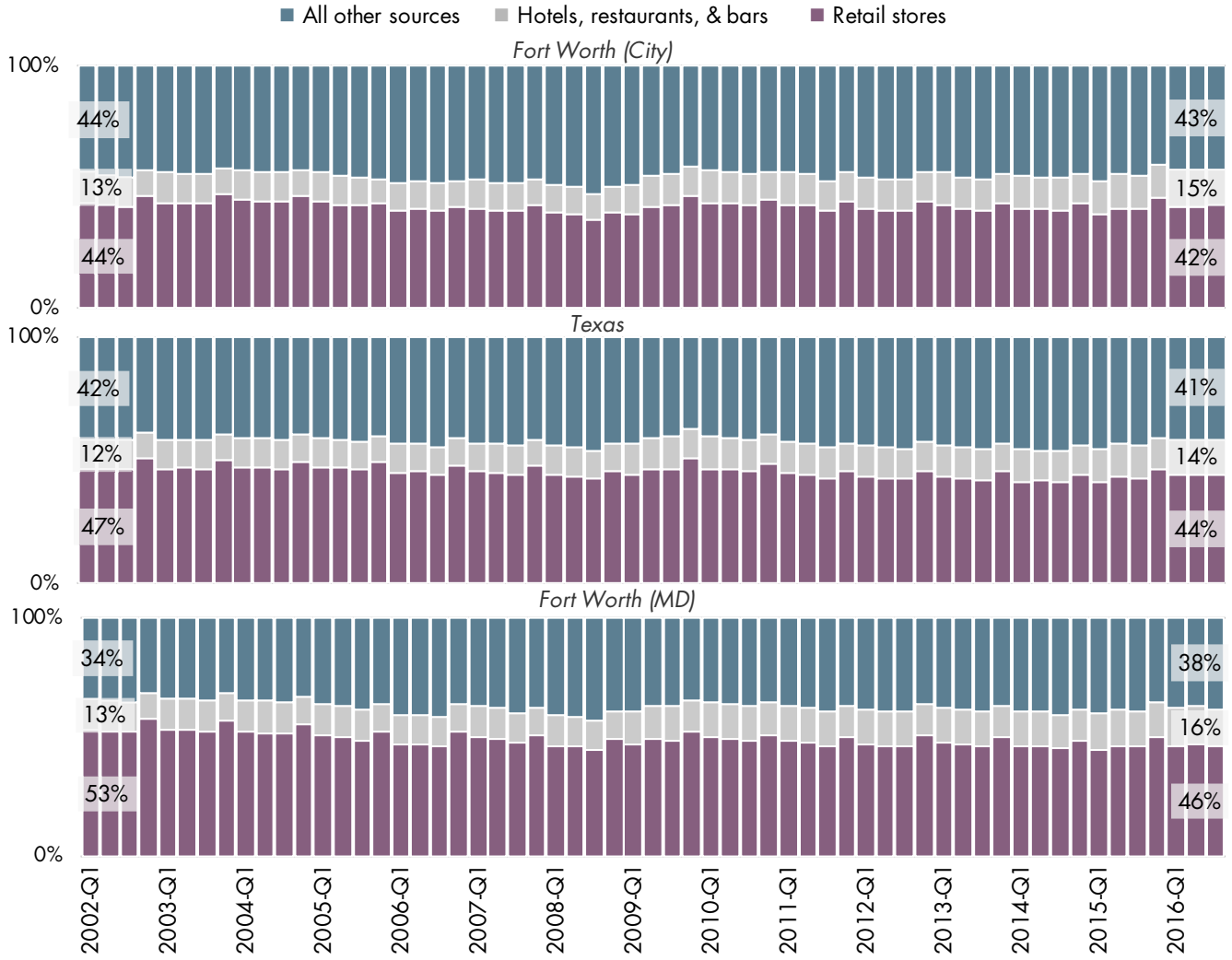
2007			
Taxpayer	**Industry**	**Taxes levied ($mil)**	**% of base**
TU Electric / Oncor	*Electric utility*	$358.8	1.1%
Sundance Square	*Real estate*	$351.9	1.0%
Southwestern Bell (AT&T)	*Telephone utility*	$303.9	0.9%
AMR / American Airlines	*Airline*	$255.4	0.8%
Alcon Laboratories	*Pharmaceuticals*	$173.0	0.5%
Behringer Harvard Burnett	*Real estate*	$166.3	0.5%
KAN AM Riverfront Campus	*Corporate campus*	$157.2	0.5%
DRH Worthington	*Hotel*	$133.1	0.4%
BNSF Railway	*Rail freight transportation*	$122.4	0.4%
Crescent Real Estate	*Real estate*	$121.6	0.4%
Top 10 taxpayers		**$2,143.61**	**6.4%**

Source: City of Fort Worth, Comprehensive Annual Financial Report, FY 2016, pp. 224.

The sales and use tax in Texas is levied widely across all sectors of the economy, with about 4 out of every 10 dollars deriving from sources other than traditional ones like retail stores, restaurants, bars, and hotels. As Figure 76 shows, the city of Fort Worth's sales and use tax base has a distribution across these sectors that is more or less in line with the state's overall patterns. In other words, there are no apparent red flags to indicate structural problems, nor are there any outliers to indicate particular structural advantages.

One minor pattern of note, however, is that the retail sector in the *municipality* has historically produced a smaller share of sales tax revenue than has the retail sector has in the metropolitan division. As recently as 2002, 53 percent of the sales taxes collected across the metropolitan division came from retail stores, compared to 44 percent in the city of Fort Worth during the same period. This differential has dissipated significantly over the past 15 years, indicating that it was likely due—at least in part—to the effect of suburban shopping malls outside the city's jurisdiction. National structural changes within the retail sector have put these properties at a disadvantage over the past 15 years. This may partially explain why the metropolitan division's sales taxes collected from the retail sector have moved more in line with the city's over this period.

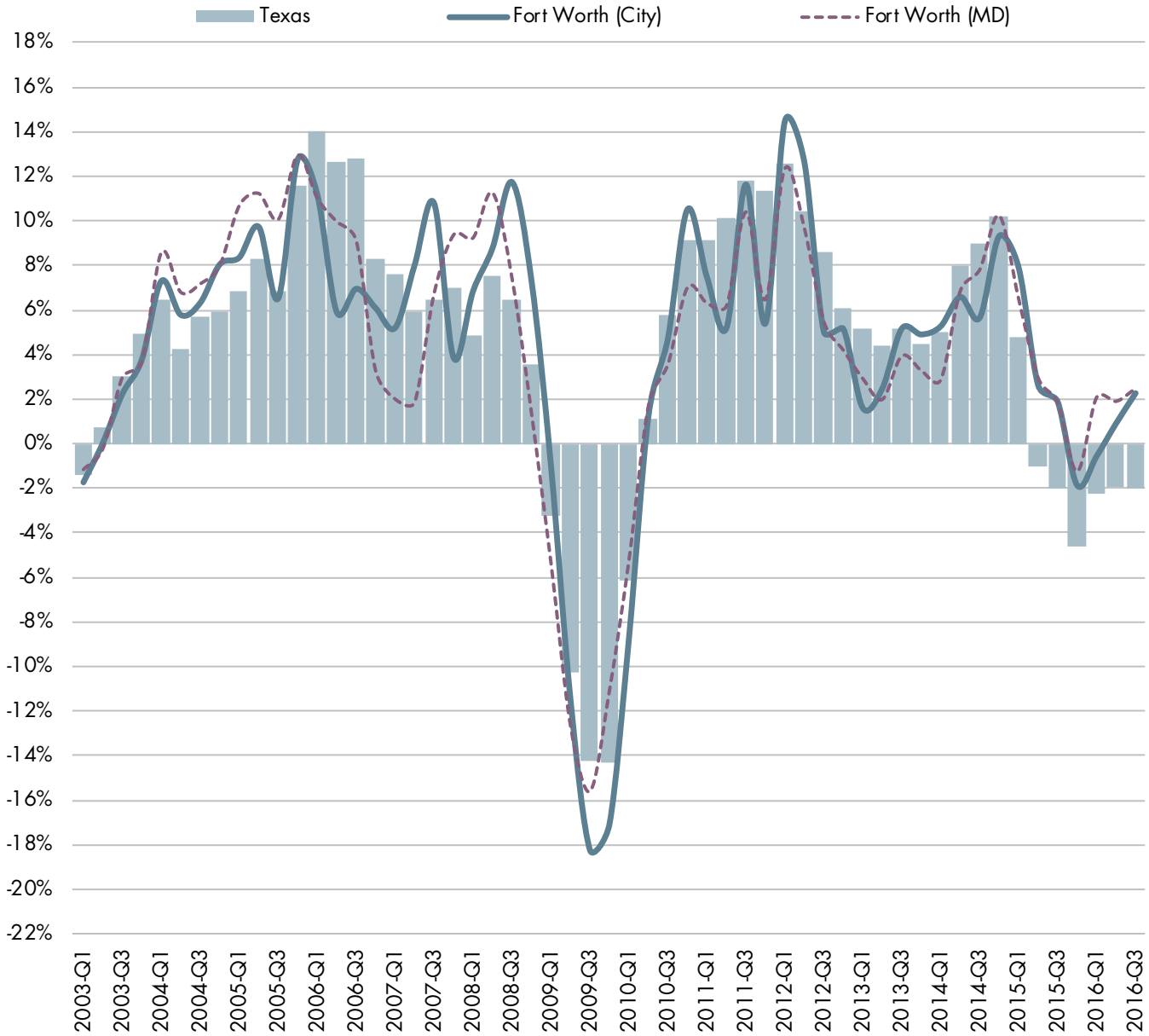
FIGURE 76. DISTRIBUTION OF THE SALE TAX BASE
CITY VS METROPOLITAN DIVISION AND STATEWIDE PATTERNS



Source: Texas Comptroller of Public Accounts.

The city sales and use tax collections, as shown in Figure 77, have risen and fallen in line with the state's overall economic cycle. It is not uncommon for individual cities or counties to show more volatility than the state overall. This is due largely to geographic size, as the state's larger jurisdiction inevitably has a smoothing effect on the many cities and counties included in the state average. Given this effect, one might reasonably expect more volatility in the city of Fort Worth's sales tax cycle because it covers a smaller jurisdiction compared to the state. Yet the city's and the metropolitan division's year-over-year changes in collections have largely mirrored state patterns in recent years. Again, no apparent red flags in the headline data.

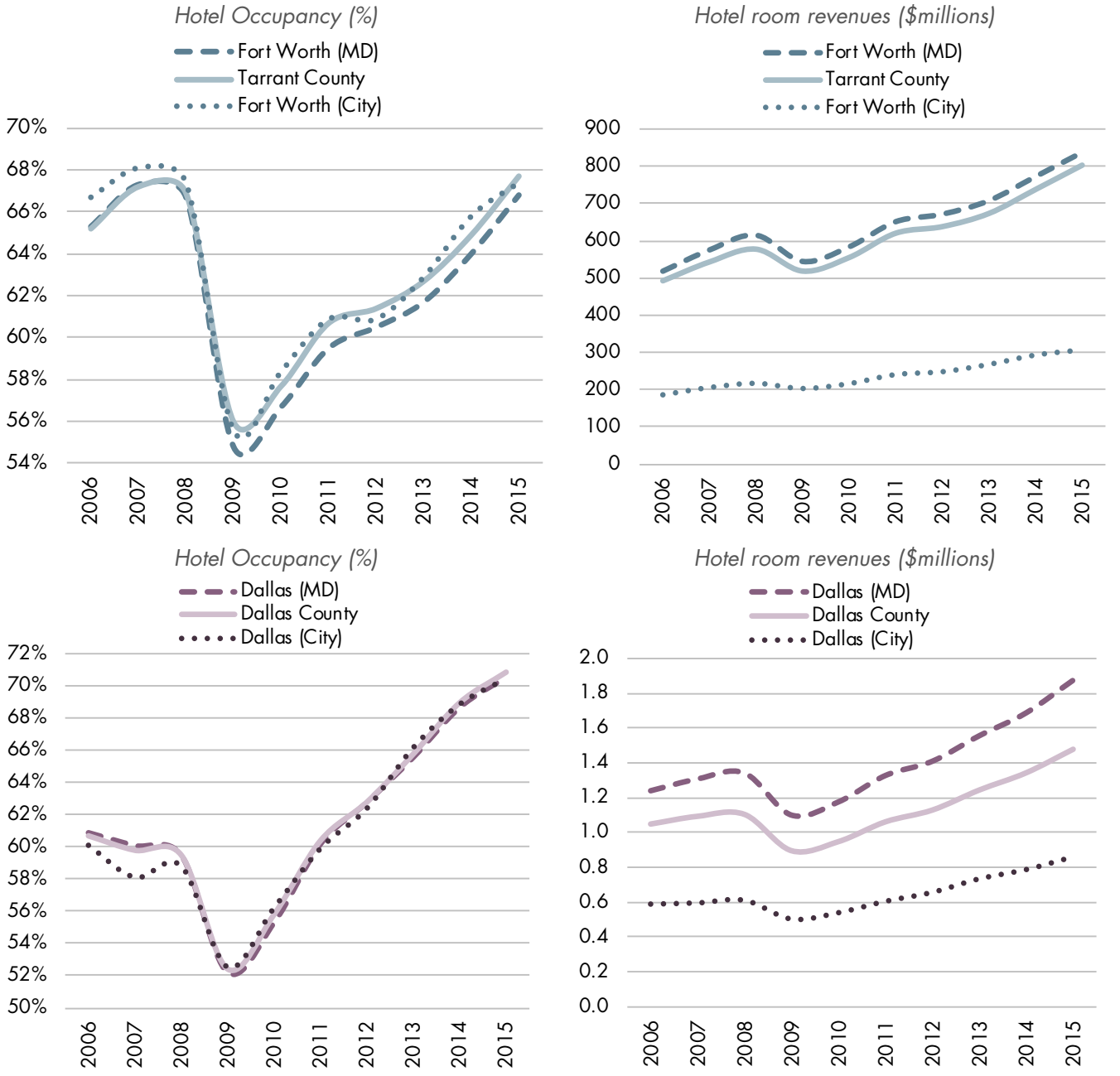
FIGURE 77. GROWTH OF THE FORT WORTH SALES TAX BASE
PERCENT CHANGE FROM THE SAME QUARTER A YEAR EARLIER



Source: Texas Comptroller of Public Accounts.

The city's hotel occupancy rates over the past decade have fallen and risen in line with state (and metropolitan) patterns (Figure 78). Hotel room revenues in the Fort Worth MD surpassed $800 million in 2015 for the first time. The majority of these revenues were generated in Tarrant County. In similar urban areas in the US, one might expect the central city (and especially the CBD) of a large metropolitan county to be the major local generator of hotel revenues. Fort Worth not only breaks that pattern, the city's hotel revenues make up less than half of the county total. The offset is likely due to the major hotels in and around DFW International Airport that lie outside the city's jurisdiction in addition to the major hotel/entertainment complex located in Grapevine and the recreational facilities clustered in Arlington. Similar figures for the Dallas hotel market are also shown below.

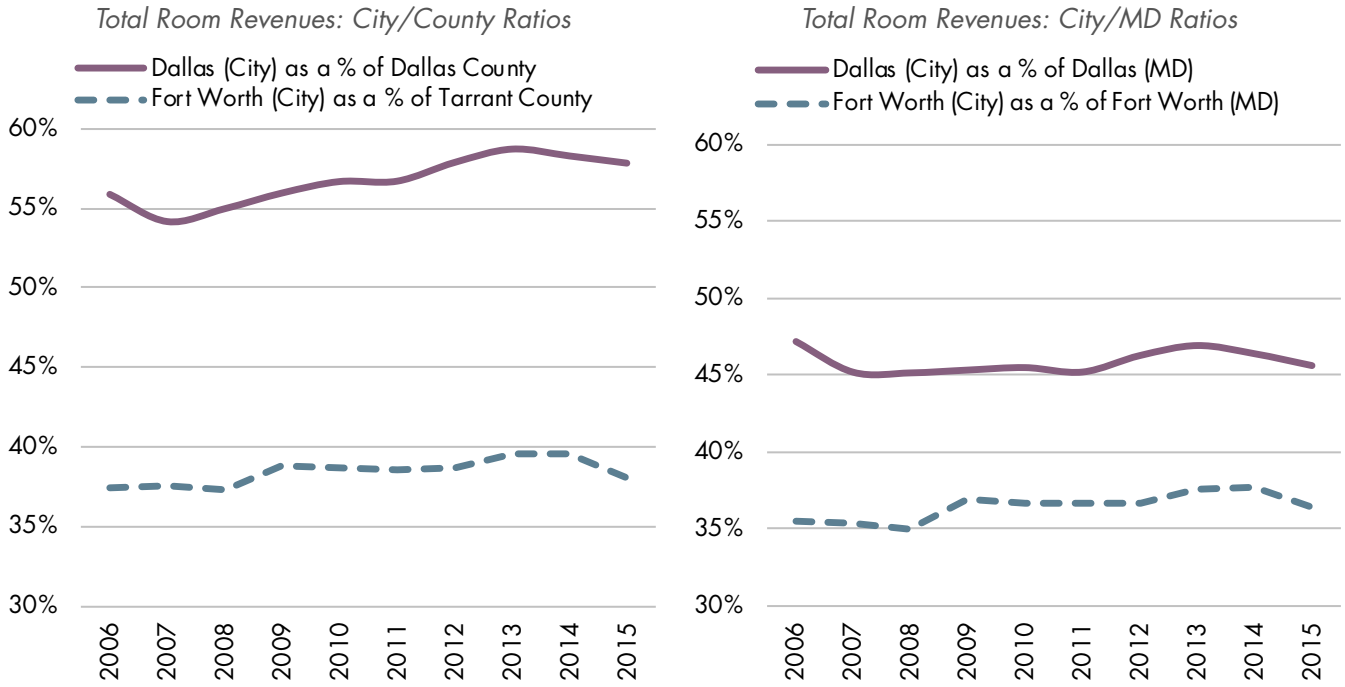
FIGURE 78. TOURISM INDICATORS: HOTEL OCCUPANCY RATES AND ROOM REVENUES



Sources: Office of the Governor, Economic Development & Tourism, Texas Hotel Performance Reports.

Fort Worth's hotel market is under-developed relative to neighboring Tarrant County cities and relative to Dallas. The city of Dallas accounts for 46 percent of hotel revenues in the Dallas MD compared with Fort Worth, which accounts for 36 percent of hotel revenues in the Fort Worth MD. These statistics point to an unmet need and opportunity for additional hotel development, especially large hotels in downtown Fort Worth. Further analysis of the CBD and citywide hotel market would provide a better understanding of the opportunity.

FIGURE 79. TOURISM INDICATORS: CENTRAL CITY MARKET SHARE OF ROOM REVENUES



Source: Office of the Governor, Economic Development & Tourism, Texas Hotel Performance Reports.

7. REAL ESTATE & LAND USE

Figure 80 shows the relative population sizes of the 15 largest cities in the Dallas-Fort Worth metro area as of January 1, 2016. This map will serve as a touchstone for the real estate section. These 15 bubbles represent the largest municipal jurisdictions in the Dallas-Fort Worth metro area, yet as the remainder of this section shows, activities and assets in the metro area are necessarily not allocated in the same way.

FIGURE 80. TOTAL POPULATION AS OF JANUARY 1, 2016
METRO AREA CITIES WITH POPULATIONS OF 100,000+

Source: Texas State Data Center.

The populations of cities in the metro area did not grow evenly over the 2010-2016 period. Fort Worth added almost as many new residents as Dallas. Even more surprising, the metro area's third-ranking city in terms of new residents added was Frisco, which added almost half as many new residents as Fort Worth. (Note: Figure 81 shows population growth between the 2010 Census and the State Demographer's 2016 estimate.)

FIGURE 81. NET POPULATION CHANGE, 2010-2016
METRO AREA CITIES WITH POPULATIONS OF 100,000+

Source: Texas State Data Center.

So, what happens in the years ahead? Of the largest cities in the Metro area, many are short on vacant land unless they annex. In this area, Fort Worth leads the metro area. According to the NCTCOG, the city's inventory of vacant land is higher than Dallas, Frisco, and McKinney combined. Some of the metro area's larger cities, including Carrollton, Lewisville, Richardson, Garland, and Allen had fewer than 5,000 acres of vacant land in inventory compared to Fort Worth's total of more than 70,000 acres.

FIGURE 82. ACRES OF VACANT LAND, 2010
METRO AREA CITIES WITH POPULATIONS OF 100,000+

Source: North Central Texas Council of Governments.

The matrix below (Figure 83) shows the composition of land uses in these same 15 largest cities in the Dallas-Fort Worth metro area. In Fort Worth, nearly one-third of the land area is undeveloped, a relatively high percentage in the metro area, especially for the central city of a metropolitan division (Dallas, in contrast, has only 12 percent of its land area classified as vacant). Other than Fort Worth, most of the metro area's larger cities with significant undeveloped land inventories are along the northeast periphery of growth.

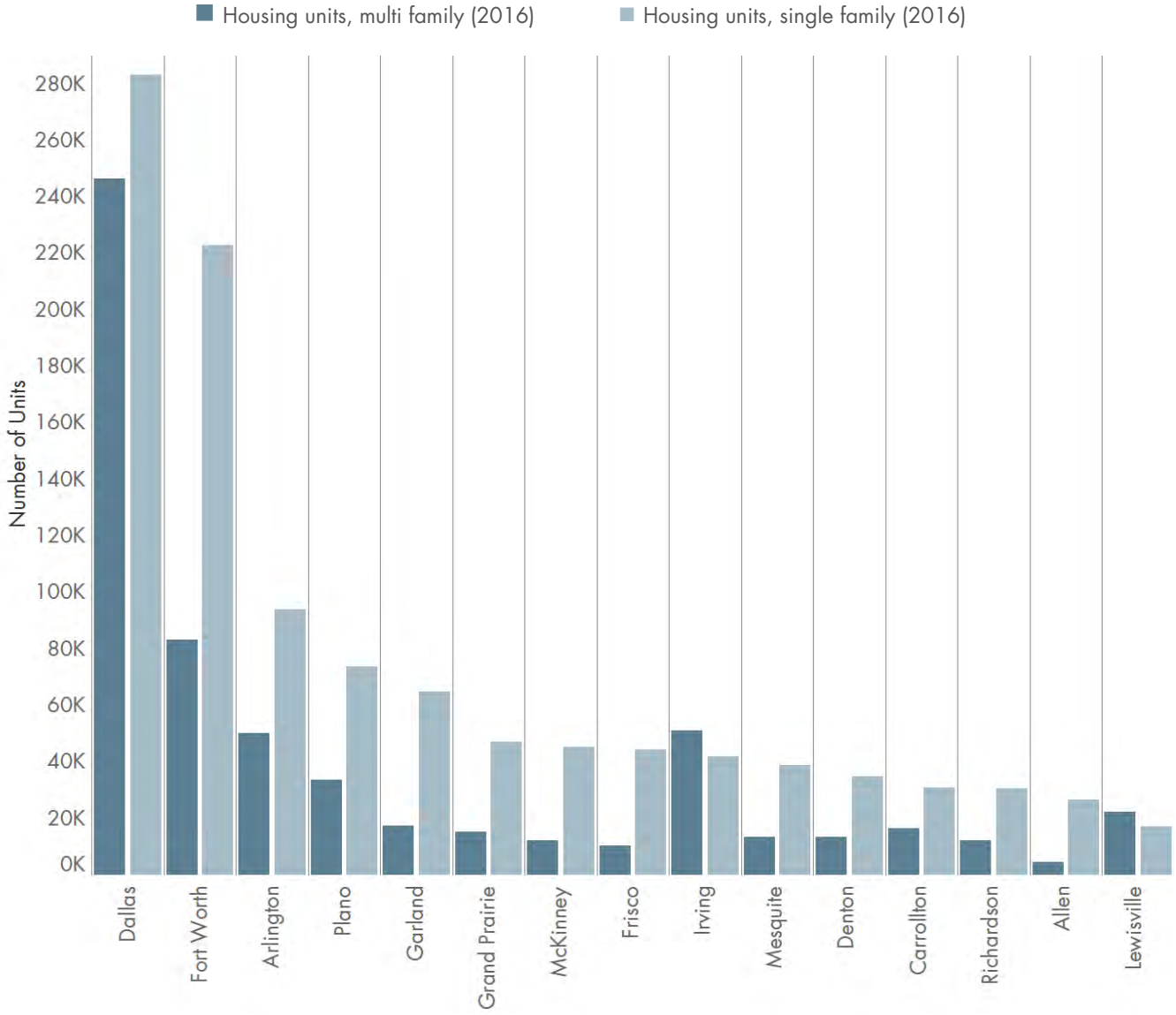
FIGURE 83. LAND USE (% OF TOTAL)
METRO AREA CITIES WITH POPULATIONS OF 100,000+

	% Vacant	% Single family	% Infrastructure	% Commercial/Industrial	% Dedicated open	% Institutional	% Water	% Multi-family	% Other residential	% Under construction
Denton	46.4%	14.0%	10.8%	6.0%	7.9%	3.9%	0.9%	1.7%	7.5%	1.0%
Frisco	44.9%	19.4%	14.3%	6.4%	7.2%	3.7%	0.8%	1.1%	2.1%	0.2%
McKinney	40.0%	19.6%	14.7%	6.4%	10.0%	4.1%	1.1%	1.7%	2.0%	0.4%
Fort Worth	31.9%	19.6%	19.1%	10.9%	9.1%	3.3%	2.8%	1.8%	1.2%	0.4%
Mesquite	29.8%	26.5%	20.7%	9.2%	5.9%	4.9%	0.4%	2.3%	0.3%	0.0%
Allen	25.6%	30.7%	19.6%	8.1%	9.6%	4.3%	0.3%	1.5%	0.1%	0.2%
Grand Prairie	17.4%	17.5%	15.5%	12.4%	19.8%	2.4%	11.6%	1.9%	1.4%	0.1%
Garland	13.0%	33.8%	22.6%	13.0%	8.5%	4.8%	0.5%	3.3%	0.1%	0.4%
Irving	12.1%	17.7%	28.7%	18.1%	11.4%	4.0%	1.7%	5.6%	0.4%	0.3%
Dallas	11.9%	23.6%	20.5%	11.5%	12.5%	3.3%	12.0%	4.2%	0.4%	0.1%
Plano	11.0%	32.2%	21.8%	14.2%	10.5%	4.8%	0.5%	4.5%	0.5%	0.0%
Lewisville	10.6%	12.8%	18.1%	12.1%	22.7%	2.8%	15.3%	3.7%	1.6%	0.2%
Arlington	9.9%	33.0%	20.8%	11.3%	10.9%	5.2%	3.6%	3.9%	1.3%	0.1%
Richardson	7.0%	33.3%	23.1%	16.3%	10.0%	5.4%	0.4%	3.9%	0.3%	0.2%
Carrollton	6.4%	24.6%	21.7%	18.4%	18.2%	3.6%	2.5%	4.1%	0.1%	0.3%

Source: North Central Texas Council of Governments.

The housing mix in Fort Worth differs significantly from the city of Dallas, which approached a 1:1 ratio of single-family and multi-family units in 2016. Fort Worth's ratio is closer to 3:1.

FIGURE 84. SINGLE- & MULTI-FAMILY HOUSING STOCK AS OF JANUARY 1, 2016
METRO AREA CITIES WITH POPULATIONS OF 100,000+



Source: North Central Texas Council of Governments.

Between 2010 and 2016, Fort Worth added nearly 13,000 single-family homes, more than any other city in the metro area. The net change in single family units in the city of Dallas was slightly negative over the same period.

FIGURE 85. NET NEW SINGLE-FAMILY HOUSING UNITS ADDED, 2010-2016
METRO AREA CITIES WITH POPULATIONS OF 100,000+

Source: North Central Texas Council of Governments.

As Figure 86 shows, the contrast between single-family and multi-family development is distinct. Dallas experienced a slight decline in the number of single-family units in the 2010-2016 period, but the inventory of multi-family units moved up sharply. The city of Dallas netted just over 20,000 new multi-family units during this period while Fort Worth added about 7,000. Many of these new multi-family units are coming in the form of downtown and close-in urban apartments and condos. In Dallas's case, the city's multi-family market has boomed in recent years thanks to the emergence of the Uptown district as a top neighborhood for millennials and professionals seeking an urban lifestyle. With each city's housing development choices come demographic, land use, and fiscal implications.

FIGURE 86. NET NEW MULTI-FAMILY HOUSING UNITS ADDED, 2010-2016
METROPLEX CITIES WITH POPULATIONS OF 100,000+

Source: North Central Texas Council of Governments.

Section 5 of this report highlighted Fort Worth's employment patterns of recent years. Of the most significant trends documented in this section related to the divergence of office-using employment growth between the metropolitan statistical divisions of Dallas and Fort Worth. To be sure, these trends were backward looking, meaning they underscored events that had already unfolded and did not reflect the future.

Contrast these recent trends with Figure 87, below, which provides a snapshot of the present (Q1 2017) and indirectly, the near-future. Figure 87 underscores Fort Worth's ability to compete regionally for office-using jobs. Office space under construction in the Dallas-Fort Worth metro area tells us where the *capacity* to add new jobs will be located in the months and years ahead. As of the end of the first quarter of 2017, more than 6.4 million square feet of office space was under construction in the Far North Dallas submarket, a narrowly contained area that extends from the north side of the LBJ Freeway (in Dallas) up to and beyond the Sam Rayburn Tollway (in Frisco) and includes the north/south corridors along the Dallas North Tollway and Preston Road. Compare this to Fort Worth, where the underway total for office space was under 500,000 square feet for the same period. This included 280,000 square feet underway downtown and about 108,000 square feet combined in the North and South Fort Worth submarkets. Using the general rule-of-thumb of 200 square feet of leased space per office worker, the Far North Dallas submarket is adding enough capacity to support more than 32,000 new office jobs, compared to new capacity underway in all of Fort Worth's combined submarkets, which would support fewer than 2,000 new office workers.

FIGURE 87. DFW OFFICE MARKET OVERVIEW BY SUBMARKET, 2017 Q1

Submarket	Under Constr. (SF)	Inventory (SF)	Construction Rate	Vacancy Rate (%)	Asking Rent ($)
Far North Dallas	6,443,100	57,743,297	11.2%	13.5%	$27.55
Uptown/Turtle Creek	1,295,323	14,664,921	8.8%	10.5%	$37.46
Las Colinas	987,395	39,587,092	2.5%	13.4%	$24.09
Mid-Cities	892,627	40,406,416	2.2%	12.4%	$21.71
Richardson/Plano	812,701	40,835,578	2.0%	15.0%	$24.20
Dallas CBD	353,637	33,581,393	1.1%	22.5%	$25.67
East Dallas	293,921	13,763,001	2.1%	10.6%	$23.44
Ft Worth CBD	280,489	11,806,524	2.4%	10.3%	$25.05
Preston Center	183,589	5,885,416	3.1%	8.4%	$36.24
Lewisville/Denton	167,104	12,977,935	1.3%	7.5%	$22.16
Stemmons Freeway	72,630	14,945,132	0.5%	23.3%	$15.78
South Ft Worth	66,236	19,742,816	0.3%	8.0%	$23.09
North Fort Worth	42,003	6,551,118	0.6%	6.2%	$20.62
Southwest Dallas	6,300	7,231,323	0.1%	7.8%	$17.28
Central Expressway	0	15,154,527	0.0%	10.1%	$26.88
LBJ Freeway	0	22,594,714	0.0%	22.3%	$22.00
Northeast Ft Worth	0	5,400,765	0.0%	34.1%	$19.18
Dallas/Fort Worth Total	**11,897,055**	**362,873,968**	**3.3%**	**14.3%**	**$24.52**

Sources: CoStar, JLL.

Encouraging new development, however, can be a game of timing. As Figure 88 shows, office construction rates in the Dallas-Fort Worth metro area have been running at over 3 to 4 percent of inventory for the past year, the highest rate of development in more than a decade. This high level of construction, at least so far, has been supported by lower-than-average office vacancy rates (below 15 percent across the metro area since 2014) and rising rent prices.

FIGURE 88. DALLAS-FORT WORTH OFFICE MARKET OVERVIEW SINCE 2005

Year	Under Construction (SF)	Inventory (SF)	Construction Rate	Vacancy Rate (%)	Asking Rent ($)
2005	7,164,371	315,591,694	2.3%	16.7%	$17.84
2006	7,905,315	322,039,317	2.5%	16.1%	$18.98
2007	9,481,523	328,624,879	2.9%	16.1%	$20.17
2008	6,579,618	336,353,257	2.0%	16.3%	$20.54
2009	3,774,113	341,221,538	1.1%	17.5%	$19.78
2010	1,324,831	344,678,744	0.4%	17.7%	$19.18
2011	2,226,668	345,107,995	0.6%	17.0%	$19.24
2012	2,486,915	346,612,797	0.7%	16.5%	$19.41
2013	6,847,144	347,771,797	2.0%	15.9%	$20.25
2014	8,824,421	350,268,503	2.5%	14.6%	$21.56
2015	9,723,202	356,545,355	2.7%	14.0%	$23.19
2016 Q1	10,833,786	358,285,431	3.0%	14.3%	$23.55
2016 Q2	13,221,229	358,681,946	3.7%	14.4%	$23.66
2016 Q3	13,154,271	359,695,145	3.7%	14.1%	$23.99
2016 Q4	13,462,603	360,487,043	3.7%	14.2%	$24.13
2017 Q1	11,897,055	362,873,968	3.3%	14.3%	$24.52

The composition of industrial development across the metro area presents a more balanced picture of construction than does the office sector. (See Figure 89.) The submarkets with the most square footage underway lie at the opposite ends of a diagonal, with 5.1 million square feet underway in South Dallas and 4.8 million underway in North Fort Worth.

FIGURE 89. DALLAS-FORT WORTH INDUSTRIAL MARKET OVERVIEW BY SUBMARKET, 2017 Q1

Submarket	Under Constr. (SF)	Inventory (SF)	Construction Rate	Vacancy Rate (%)	Asking Rent ($)
South Dallas Ind	5,050,321	93,378,550	5.4%	9.1%	$8.47
North Ft Worth Ind	4,783,589	88,270,104	5.4%	7.1%	$4.40
Great SW/Arlington Ind	3,512,032	105,927,076	3.3%	8.1%	$4.52
Northwest Dallas Ind	2,690,553	108,423,645	2.5%	5.8%	$6.05
Northeast Dallas Ind	2,358,886	114,139,487	2.1%	6.1%	$6.02
DFW Airport Ind	2,210,346	73,149,630	3.0%	5.5%	$5.62
South Stemmons Ind	534,233	133,966,547	0.4%	6.4%	$6.17
East Dallas Ind	351,860	50,434,697	0.7%	5.5%	$4.28
South Ft Worth Ind	197,500	89,003,219	0.2%	3.7%	$5.59
Dallas/Fort Worth Total	**21,689,320**	**856,692,955**	**2.5%**	**6.5%**	**$5.61**

Source (both charts this page): CoStar, JLL.

Like the office sector, current industrial construction rates are relatively high compared to the past dozen years (Figure 90), but lower vacancy rates and rising rents over the past couple of years have made this possible.

FIGURE 90. DALLAS-FORT WORTH INDUSTRIAL MARKET OVERVIEW SINCE 2005

Year	Under Construction (SF)	Inventory (SF)	Construction Rate	Vacancy Rate (%)	Asking Rent ($)
2005	9,771,454	715,392,733	1.4%	9.8%	$4.56
2006	13,979,453	728,855,447	1.9%	9.0%	$4.58
2007	20,587,207	744,947,706	2.8%	8.2%	$4.72
2008	11,497,915	768,226,810	1.5%	9.6%	$4.71
2009	1,749,286	779,636,811	0.2%	11.3%	$4.49
2010	1,436,416	781,359,629	0.2%	11.4%	$4.42
2011	2,377,284	782,594,075	0.3%	9.8%	$4.31
2012	4,735,235	784,828,918	0.6%	8.6%	$4.47
2013	14,508,246	792,180,564	1.8%	7.1%	$4.81
2014	16,751,088	807,746,227	2.1%	7.2%	$5.05
2015	20,528,916	826,794,704	2.5%	6.7%	$5.14
2016 Q1	23,999,102	831,022,288	2.9%	6.4%	$5.19
2016 Q2	27,045,867	836,252,446	3.2%	6.7%	$5.24
2016 Q3	24,934,851	841,965,291	3.0%	6.1%	$5.28
2016 Q4	22,923,028	849,118,623	2.7%	6.2%	$5.41
2017 Q1	21,689,320	856,692,955	2.5%	6.5%	$5.61

Source: CoStar, JLL.

Structural trends in the retail sector—from the decline of suburban shopping malls to the rise of e-commerce—have created a degree of uncertainty about the tenancy trends that will shape the retail spaces of the future. To be sure, the general trend across the country has been away from tenants selling goods and toward tenants selling services. We see this slowly unfolding before our eyes each day, as wireless service providers and dentists' offices and insurance agencies take over retail spaces that used to rent videos or sell cameras.

These structural trends in some ways have left retail developers operating cautiously. The amount of retail space under construction in the DFW area in 2016 was half the level underway a decade earlier in 2006 (Figure 92). Vacancy rates have fallen and rent prices have risen over this period, yet retail construction has not bounced back to where it was in previous cycles. In the retail sector, the broad patterns seen in Fort Worth differ little from those seen in Dallas (or for that matter, in much of the rest of the country).

FIGURE 91. DFW RETAIL MARKET OVERVIEW BY SUBMARKET, 2017 Q1

Submarket	Under Const. (SF)	Inventory (SF)	Construction Rate	Vacancy Rate (%)	Asking Rent ($)
North Central Dallas Ret	1,441,489	41,160,478	3.5%	5.0%	$24.40
Far North Dallas Ret	1,178,831	73,381,802	1.6%	5.2%	$17.29
Suburban Fort Worth Ret	909,347	38,332,847	2.4%	3.9%	$14.06
West Dallas Ret	671,392	40,792,668	1.6%	4.7%	$14.27
Mid-Cities Ret	525,743	67,950,710	0.8%	4.4%	$14.32
Near North Dallas Ret	252,420	25,760,758	1.0%	4.4%	$17.41
Central Dallas Ret	239,924	21,044,407	1.1%	3.2%	$23.69
Central Fort Worth Ret	181,878	35,117,003	0.5%	4.8%	$13.42
Southwest Dallas Ret	147,548	24,004,372	0.6%	6.2%	$12.09
Southwest Outlying Ret	74,667	17,394,161	0.4%	2.9%	$14.11
Southeast Dallas Ret	28,875	22,810,959	0.1%	4.3%	$11.43
East Dallas Outlying Ret	25,800	7,878,534	0.3%	3.2%	$19.28
Dallas/Fort Worth Total	**5,677,914**	**415,628,699**	**1.4%**	**4.6%**	**$16.04**

FIGURE 92. DFW RETAIL MARKET OVERVIEW SINCE 2005

Year	Under Construction (SF)	Inventory (SF)	Construction Rate	Vacancy Rate (%)	Asking Rent ($)
2005	9,798,608	353,499,097	2.8%	6.8%	$13.86
2006	10,600,653	364,468,883	2.9%	7.2%	$14.32
2007	9,443,787	375,300,407	2.5%	8.6%	$14.14
2008	4,625,099	384,863,292	1.2%	8.2%	$14.49
2009	2,743,806	389,886,762	0.7%	8.6%	$14.08
2010	2,397,273	392,610,197	0.6%	8.8%	$13.60
2011	2,264,719	395,295,466	0.6%	8.5%	$13.48
2012	2,895,325	397,981,235	0.7%	7.6%	$13.55
2013	4,547,204	401,015,601	1.1%	6.9%	$13.61
2014	5,837,001	404,213,240	1.4%	6.2%	$14.05
2015	4,102,984	410,673,042	1.0%	5.6%	$14.86
2016 Q1	4,856,233	412,016,239	1.2%	5.5%	$15.03
2016 Q2	4,416,105	412,910,715	1.1%	5.1%	$14.99
2016 Q3	5,407,072	414,189,024	1.3%	4.9%	$15.61
2016 Q4	5,704,648	415,019,585	1.4%	4.8%	$15.65
2017 Q1	5,677,914	415,628,699	1.4%	4.6%	$16.04

Source (both charts this page): CoStar, JLL.

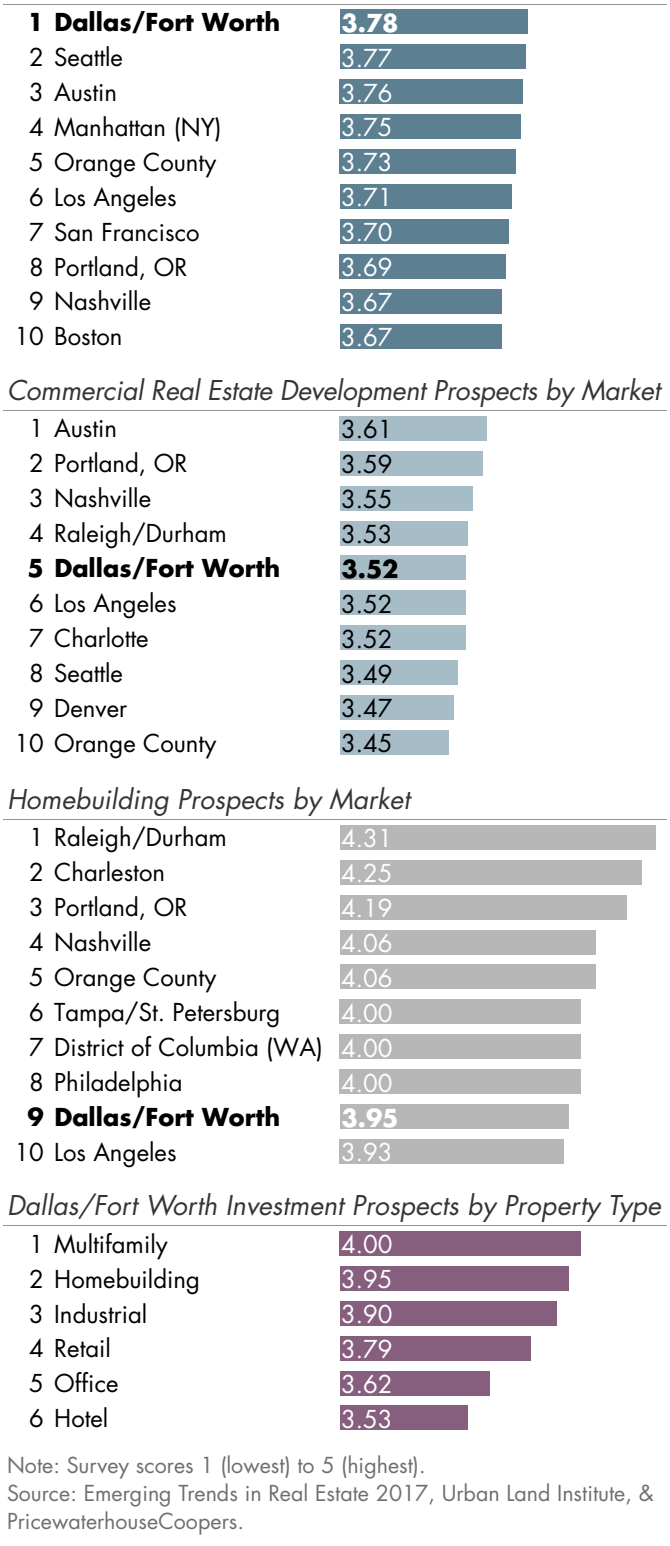
Given these trends in construction, what's next for real estate in the Dallas-Fort Worth metro area? To put things in a national perspective, we turn to an annual survey of property investors called *Emerging Trends in Real Estate,* published jointly by the Urban Land Institute and PricewaterhouseCoopers. In the 2017 US edition, investors ranked Dallas/Fort Worth first in the nation for overall investment prospects in commercial real estate for the year ahead. This is significant, because bullish investment prospects can translate to capital inflows and competitive bidding, which in a supply-constrained environment can lift property prices—and the tax base along with it.

Yet, the 2017 survey also ranked Dallas/Fort Worth fifth for commercial development prospects, indicating that supply constraint is unlikely to be a worry, at least in the near term. In addition, investors ranked Dallas/Fort Worth ninth for homebuilding prospects. There was a total of 78 ULI-defined metropolitan markets included in the published results.

The prospects for housing in Dallas/Fort Worth edged out other property types in 2017, according to the US investors who responded to the survey. The individual scores provided by real estate professionals averaged 4.00 for multi-family and 3.95 for homebuilding out of a possible 5.00. These scores were followed by industrial (3.90), retail (3.79), office (3.62), and hotel (3.53).

FIGURE 93. US COMMERCIAL REAL ESTATE MARKETS TO WATCH IN 2017

INVESTMENT AND DEVELOPMENT PROSPECTS RANKED BY REAL ESTATE INDUSTRY SURVEY PARTICIPANTS



Note: Survey scores 1 (lowest) to 5 (highest).
Source: Emerging Trends in Real Estate 2017, Urban Land Institute, & PricewaterhouseCoopers.

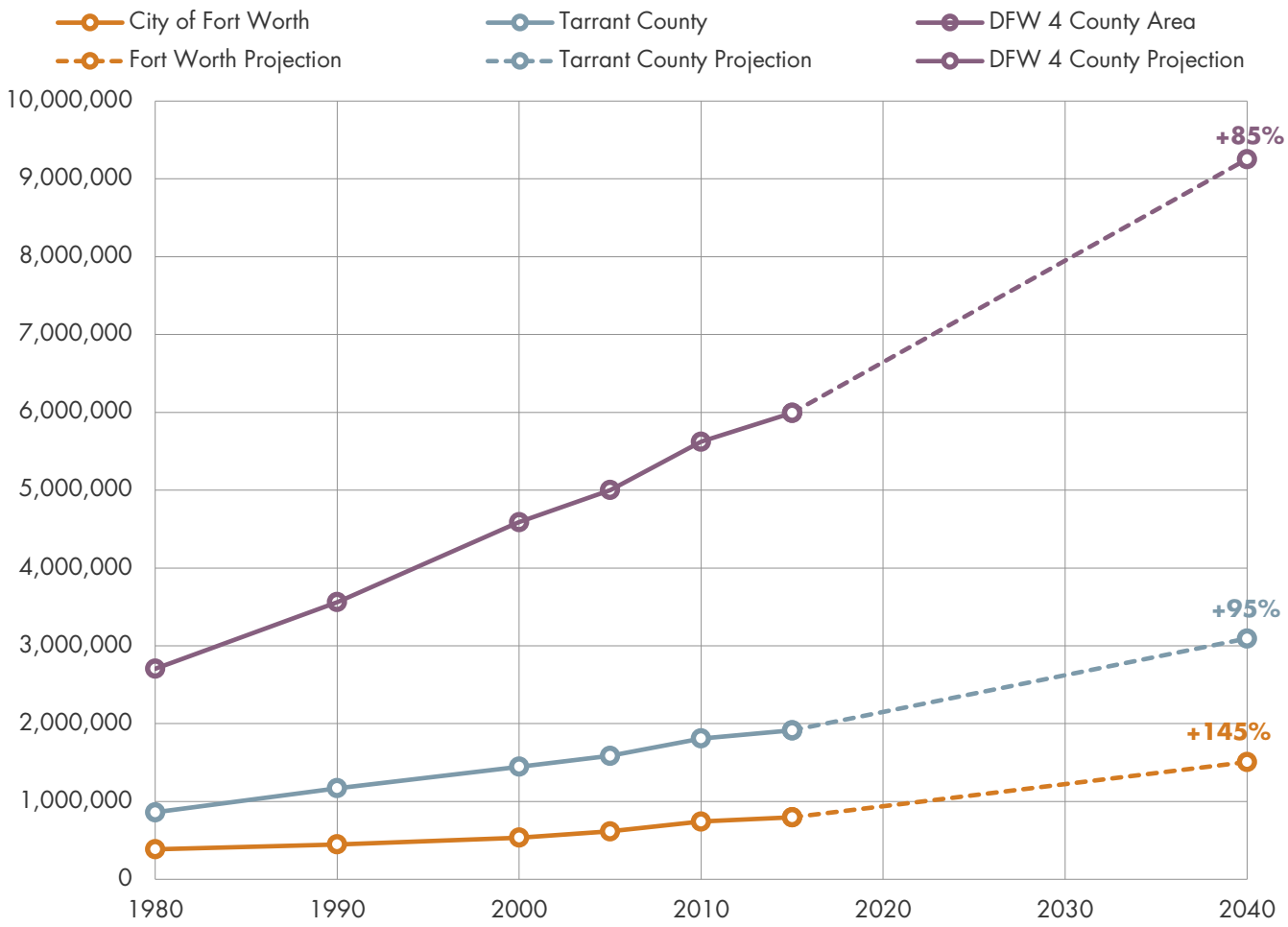
8. GROWTH ALLOCATION

REGIONAL AND CITY GROWTH TRENDS

As indicated thus far, the Dallas-Fort Worth metro area and specifically the city of Fort Worth are experiencing remarkable growth. The Dallas-Fort Worth metro area is the national leader in employment and population growth, adding 143,000 net new residents between July 2015 and July 2016. And the city of Fort Worth is the fastest growing among the top 20 largest cities in the US, with a population gain of 60 percent between 2000 and 2016. The Dallas-Fort Worth metro area is a talent magnet, drawing new residents from across the country. Fort Worth also enjoys top position in the metro area as the city with the greatest reserve of vacant land, 70,661 acres in total, according to the NCTCOG. With the city's vacant land supply and moderate land redevelopment, the city has capacity to sustain continued growth into the future.

Population growth estimates from the NCTCOG 2040 forecast put the city of Fort Worth (145 percent increase) well above Tarrant County (95 percent) and the four-county area (85 percent), which includes Tarrant, Dallas, Denton, and Collin counties.

FIGURE 94. FORT WORTH POPULATION GROWTH
WITH PERCENT CHANGE, 2005 TO 2040



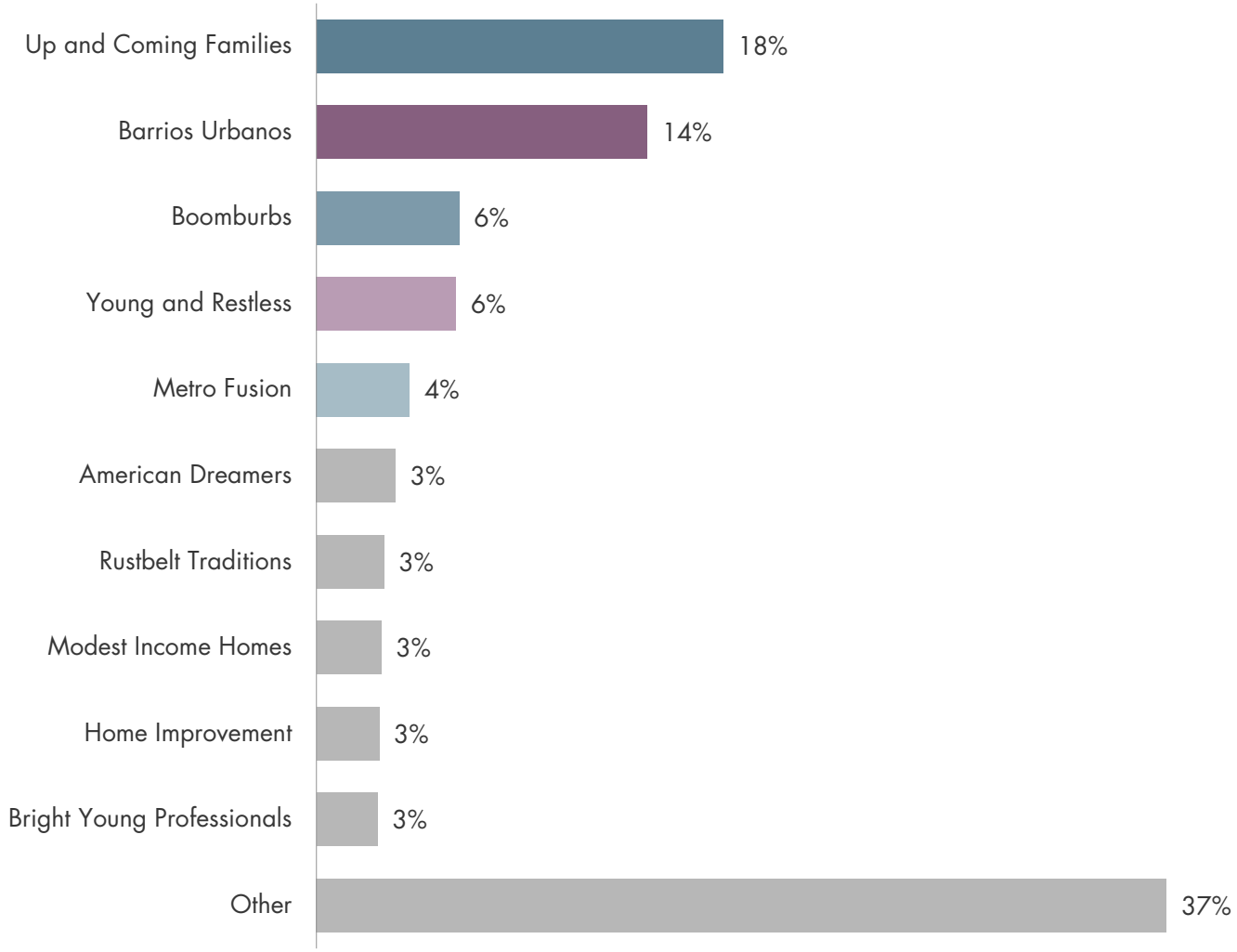
Source: Decennial Census 1980, 1990, 2000, 2010, and ACS 5-year estimates 2015; projections NCTCOG.

MARKET SEGMENTS

Market segments (also called psychographics) are data collected primarily for marketing, but which provide insight into the city's residents and workforce that is useful for planning and development activity. Market segment data goes beyond Census demographics to shed light on age, income, family size, housing and neighborhood preference, average housing costs, occupation and earnings, and spending patterns.

Esri identifies 67 distinctive segments based on their socioeconomic and demographic composition. The City of Fort Worth has a wide range of segments in the top 10 by population, including Up and Coming Families (18 percent), Barrios Urbanos (14 percent), Boomburbs (6 percent), Young and Restless (6 percent), Metro Fusion (4 percent), American Dreamers (3 percent), Rustbelt Traditions (3 percent), Modest Income Homes (3 percent), Home Improvement (3 percent), and Bright Young Professionals (3 percent). The top 10 segments compose 63 percent of all households in the city.

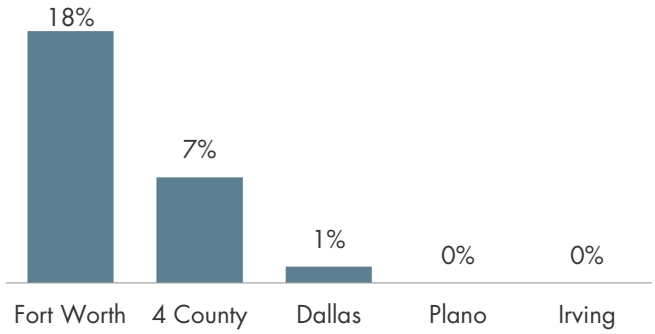
FIGURE 95. TOP 10 TAPESTRY SEGMENTS IN FORT WORTH



Source: Esri Tapestry Segmentation 2014

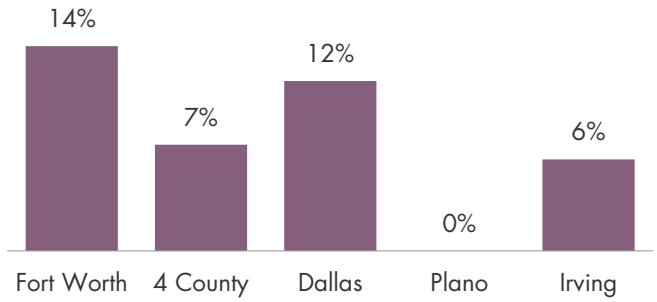
The City's top two segments, "Up and Coming Families" and "Barrios Urbanos," which together make up nearly a third of the City's residents, reflect the qualities central to Fort Worth's identity. Households in both segments tend toward homeownership, are composed predominantly of families with young children, and are racially and culturally diverse. Up and Coming Families tend to have higher incomes than the Fort Worth median household income of $53,214 (ACS 2015, 5-year estimate), while Barrios Urbanos households typically earn significantly less than Fort Worth's median.

FIGURE 96. "UP AND COMING FAMILIES" METRO COMPARISON



Source: Esri Tapestry Segmentation 2014

FIGURE 97. "BARRIOS URBANOS" METRO COMPARISON



Source: Esri Tapestry Segmentation 2014

UP AND COMING FAMILIES

Median Income $64,000

Family Size 3.10

75% Home Ownership

About: Residents are younger, more mobile, and more ethnically diverse than previous generations.

BARRIOS URBANOS

Median Income $36,000

Family Size 3.59

61% Home Ownership

About: Family centric, diverse communities with rich cultural heritage in urban outskirts.

The city of Fort Worth is a magnet for Up and Coming families, a segment better represented in Fort Worth than in the four-county area, or in other cities in the metro area like Dallas, Plano, or Irving. Fort Worth also has a higher concentration of Barrios Urbanos households, twice the percent of the four-county area, and slightly higher than Dallas.

"Boomburbs" are households of high income young professionals and families—largely college educated homeowners with very low unemployment. Boomburbs may choose to locate in suburban growth corridors and have long commutes. Median household income for this segment is close to double the city median. Fort Worth is on par with the rest of the four-county area at 6 percent, whereas Dallas has 0 percent, and Plano has 9 percent.

FIGURE 98. "BOOMBURBS" METRO COMPARISON

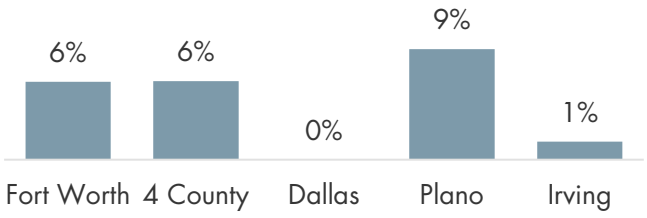
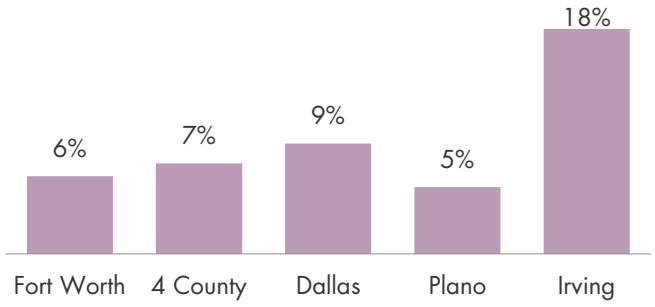
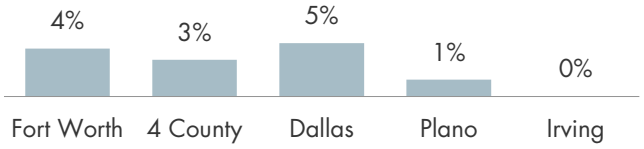


FIGURE 99. "YOUNG AND RESTLESS" METRO COMPARISON



At 6 percent of the city's population, "Young and Restless" households are comprised of singles or couples. They are young (median age 29) and educated or still in school. These household are highly mobile. Because they are beginning careers, they typically rent, move frequently, and have significantly lower income than the Fort Worth median.

FIGURE 100. "METRO FUSION" COMPARISON



Source: (all figures) Esri Tapestry Segmentation 2014

"Metro Fusion" makes up 6 percent of Fort Worth households. This segment is young (median age 29), racially and ethnically diverse, and may not speak English fluently. (Twenty percent of this segment is foreign born.) Most Metro Fusion households are renters located at the urban periphery, and over half are single-person or single-parent households. These households have significantly lower-than-city-median incomes, but are hardworking and dedicated to professional growth. More information about the Esri Tapestry segmentation, including full profiles of each segment, can be found on the Esri website, http://www.esri.com/landing-pages/tapestry.

REGIONAL EMPLOYMENT FORECAST

According to estimates from the NCTCOG, the city of Fort Worth is expected to add 410,000 jobs by 2040. Fort Worth is expected to see a 145 percent population increase between 2005 and 2040; whereas Tarrant County is expected to grow by 95 percent; and the population of the four counties of Tarrant, Dallas, Denton, and Collin are expected to grow by 85 percent by 2040.

The NCTCOG forecast for employment and households anticipates a major shift in the balance of jobs to

FIGURE 101. JOBS-HOUSEHOLD COMPARISON

JURISDICTION	JOBS-HOUSEHOLD RATIO 2005	JOBS-HOUSEHOLDS RATIO 2040
City of Fort Worth	2.06	1.74
Fort Worth ETJ (extra territorial jurisdiction)	1.95	1.58
Four-county area (Tarrant, Dallas, Collin, and Denton)	1.80	1.91

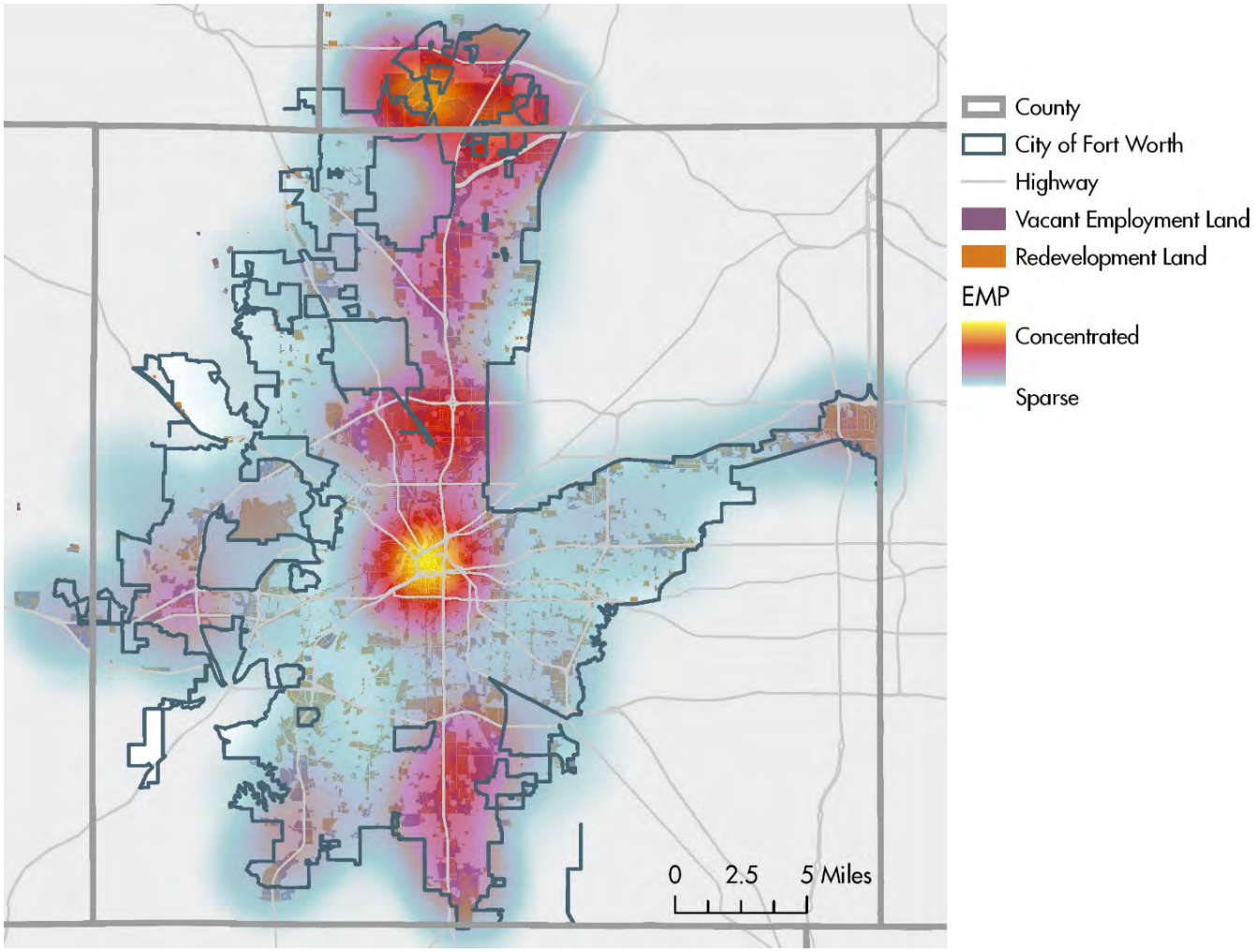
Source: NCTCOG Regional Forecast for 2040

households for the city of Fort Worth and its environs. While the four-county area would increase from 1.80 to 1.91 jobs per household, the city would fall from 2.06 to 1.74, below neighboring cities and more suburban areas. Typically, a central city like Fort Worth would *lead* the metro area as an employment hub with a jobs-household ratio *higher* than its more suburban surroundings.

LAND CAPACITY FOR EMPLOYMENT GROWTH

Fregonese Associates (FA) analyzed the future land use map in the City's Comprehensive Plan. This analysis revealed over 23,000 acres of vacant land designated for employment within the city and its extra-territorial jurisdiction. The capacity analysis also included currently developed employment land, with the understanding that a portion of the City's employment areas will undergo redevelopment in the next 25 years.

FIGURE 102. LAND CAPACITY FOR EMPLOYMENT GROWTH

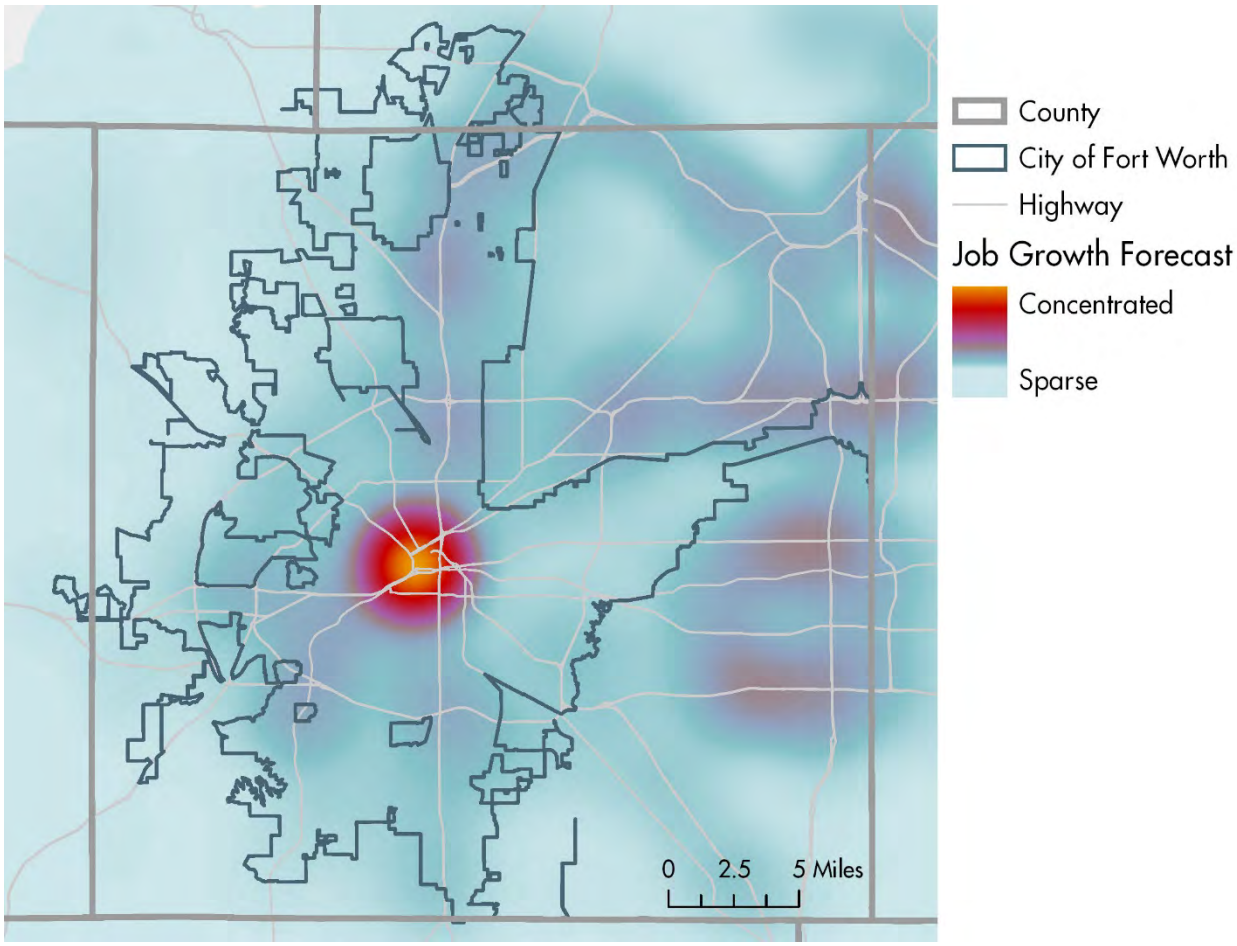


Source: City of Fort Worth GIS; Fregonese Associates (FA) analysis

REGIONAL FORECAST

In total, the NCTCOG forecast predicts an additional 408,458 new jobs by 2040, largely concentrated in the downtown core.

FIGURE 103. 2040 NCTCOG EMPLOYMENT FORECAST

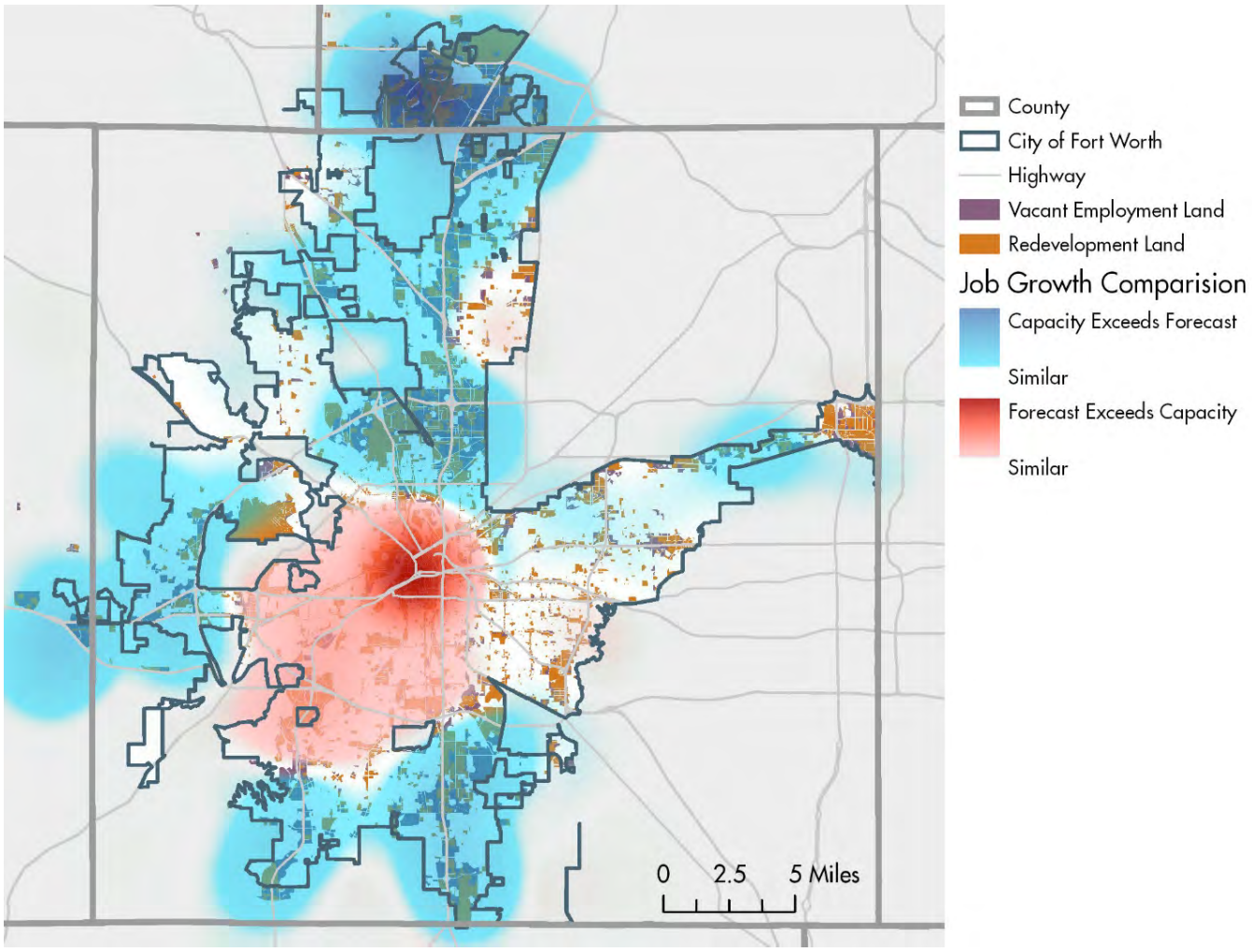


Source: NCTCOG Regional Forecast for 2040

FORECAST VERSUS CAPACITY

Fregonese Associates used its proprietary Envision Tomorrow planning tool, which allows scenario modeling and fiscal impact evaluation on a site-by-site or district-by-district basis, to provide a clear understanding of Fort Worth's most promising options for new development, redevelopment, and job growth over the next 5 to 10 years. Based on this analysis, the city's employment capacity was compared with the NCTCOG employment forecast. The map below clearly shows a mismatch between vacant land capacity designated by the City's Comprehensive Plan as future employment land, and the 2040 regional growth forecast. The forecast for downtown job growth outstrips the current capacity of vacant land. This can be explained, at least to a degree. Downtown areas often experience higher rates of redevelopment than other parts of a city. **But the NCTCOG forecast does not account for available employment land in other parts of the city, as shown in the blue areas where capacity exceeds the forecast expectations.**

FIGURE 104. COMPARISON OF FORECAST TO CAPACITY



Source: Fregonese Associates (FA) scenario analysis

GROWTH TARGETS

JOBS-HOUSEHOLD BALANCE

Fort Worth had a jobs-household ratio of 2.06 in 2005. The NCTCOG 2040 forecast expects the ratio to drop to 1.74 by 2040. The metro area, however, is forecast to become more jobs-rich, increasing from a ratio of 1.80 in 2005 to 1.91 in 2040. This would mean that the major central city and jobs center in Tarrant County would become more residential by 2040, and the surrounding suburbs would become much more commercial and industrial. This is not consistent with the direction of city policy, nor is it a trend seen in other major central cities. Central cities typically retain a higher concentration of jobs (relative to households) than do surrounding suburbs. A target ratio of two or more jobs per household would be more in line with the city's role as an employment center.

DISTRIBUTION OF EMPLOYMENT

The NCTCOG forecast places the lion's share of employment growth in downtown Fort Worth. Because there is not a substantial supply of large, vacant parcels downtown, much of that employment growth would come in the form of redevelopment or land recycling. It is important for the City's growth target to consider the vacant land supply. Fort Worth has a wealth of land outside downtown with vacant parcels, many of which are zoned for employment or designated for economic growth in the Comprehensive Plan. The NCTCOG forecast has placed fewer jobs in these areas, compared to their capacity to support employment growth. Utilizing only vacant land, Fort Worth could accommodate close to 400,000 jobs. Factoring in a moderate land redevelopment rate for downtown and office areas (10 to 20 percent), the City has more than enough capacity for the employment growth needed to maintain two jobs per household. Taking advantage of the well-served industrial and commercial land located outside the city center would further the City's economic development efforts.

GROWTH TARGET

To maintain a jobs-household ratio of 2.0 or higher, the city will need to add more employment than the NCTCOG 2040 forecast anticipates. In total, the FA Growth Target would add 565,384 new jobs by 2040, **or 156,926 more jobs than the NCTCOG forecast expects.**

FIGURE 105. EMPLOYMENT GROWTH TARGET

NCTCOG FORECAST	
2005	465,107
2040	873,565
Increase	408,458 added jobs by 2040

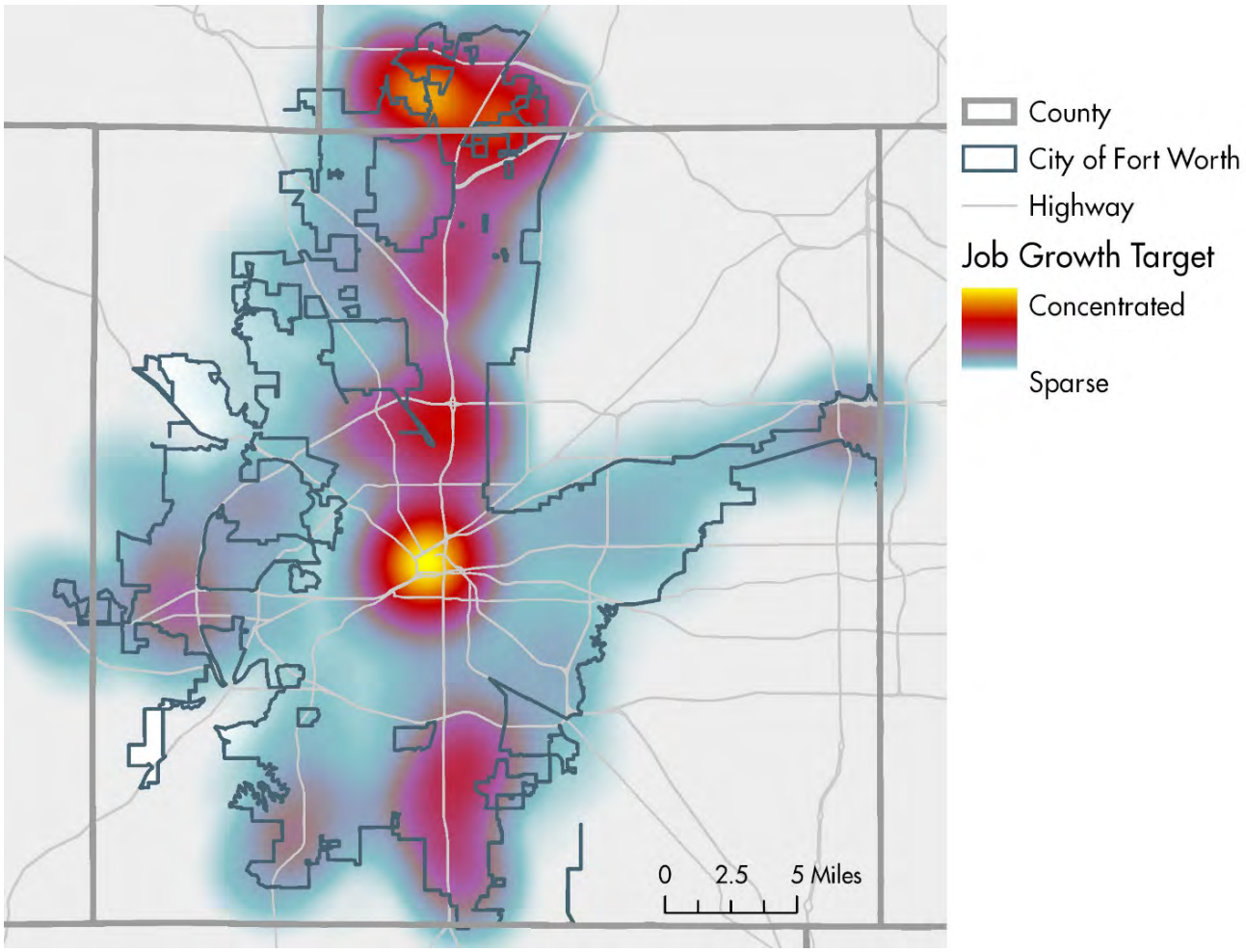
FA GROWTH TARGET	
2005	465,107
2040	1,030,491
Increase	565,384 added jobs by 2040

Source: Fregonese Associates (FA) scenario analysis; NCTCOG Regional Forecast for 2040

The map below shows the geographic distribution of new employment growth under the FA Growth Target for 2040. Similar to the NCTCOG forecast, much of the new growth will be concentrated in downtown Fort Worth. In contrast to the NCTCOG forecast, there will also be significant growth in other areas of the city, including a wide corridor extending north from downtown, connecting to the Fort Worth Alliance Airport; south along I-35W and the Chisholm Trail Parkway; and west to the Naval Air Station Joint Reserve Base.

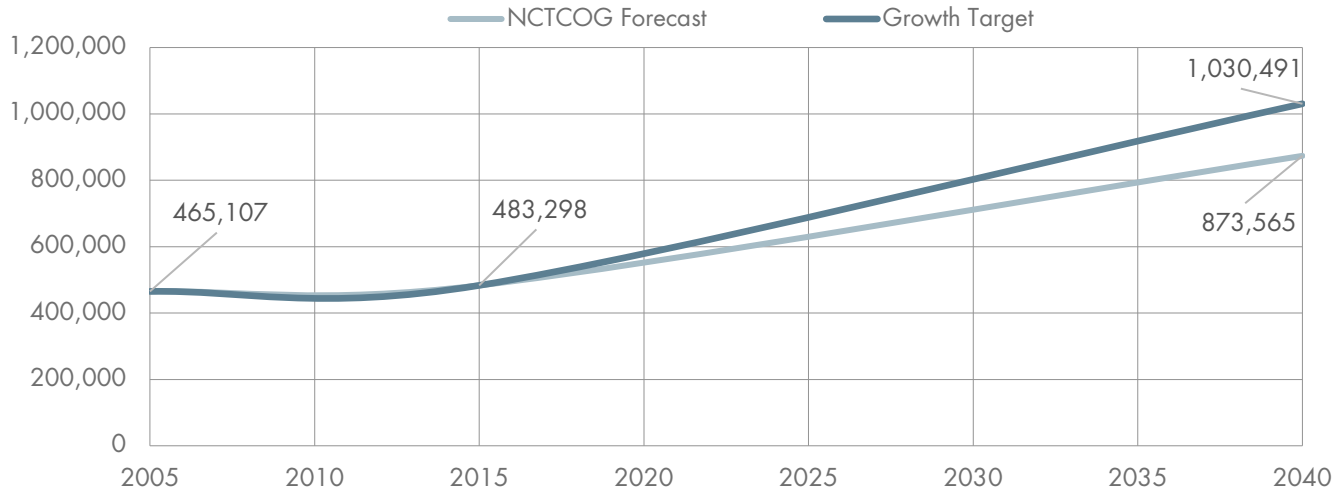
The FA Growth Target assumes that, in addition to vacant land development, there will be a moderate level of redevelopment on employment land. The growth scenario allows for employment infill of 10 percent to 20 percent in concentrated employment areas (such as downtown), and citywide 6 percent.

FIGURE 106. FORT WORTH EMPLOYMENT GROWTH TARGET FOR 2040



Source: Fregonese Associates (FA) scenario analysis

FIGURE 107. FORT WORTH EMPLOYMENT GROWTH COMPARISON



Source: Fregonese Associates (FA) scenario analysis; NCTCOG Regional Forecast for 2040

GROWTH TARGETS BY SUB AREA

To better understand and visualize the growth forecast in areas across the city, Fregonese Associates created 10 sub areas based on traffic survey zones (TSZs). The following tables and associated map show where the Growth Target allocates additional employment beyond the NCTCOG forecast. All sub areas maintain or increase employment compared to the regional forecast.

FIGURE 108. GROWTH TARGETS BY SUB AREA

SUB AREAS	NCTCOG BASE 2005 (TOTAL)	NCTCOG FORECAST 2040 (TOTAL)	NCTCOG FORECAST 2045 (TOTAL)	FORECAST INCREASE 2005-2040 (INCREMENT)	FA GROWTH TARGET 2005-2040 (INCREMENT)	COG VS FA COMPARED (DIFFERENCE)	BUILDABLE VACANT LAND (ACRES)
Downtown-Near East	121,829	239,866	246,121	118,037	118,037	No change	705
East	40,704	59,757	61,978	19,053	21,613	+2,560	1,030
Inner West	40,797	66,930	68,973	26,133	26,133	No change	288
Near North	82,389	177,071	185,448	94,682	114,272	+19,590	7,206
North-Alliance	13,398	40,801	43,766	27,403	95,490	+68,087	5,000
Northwest	30,191	40,496	41,568	10,305	15,260	+4,955	792
South	33,512	66,681	69,907	33,169	59,295	+26,126	3,351
Southeast	42,544	69,510	72,446	26,966	26,966	No change	1,329
Southwest-Chisholm Trail	55,390	101,910	105,793	46,520	46,520	No change	2,169
West-Base & Lockheed	4,353	10,543	11,999	6,190	23,607	+17,417	1,572
Total	**465,107**	**873,565**	**907,999**	**408,458**	**547,193**	**138,735**	**23,442**

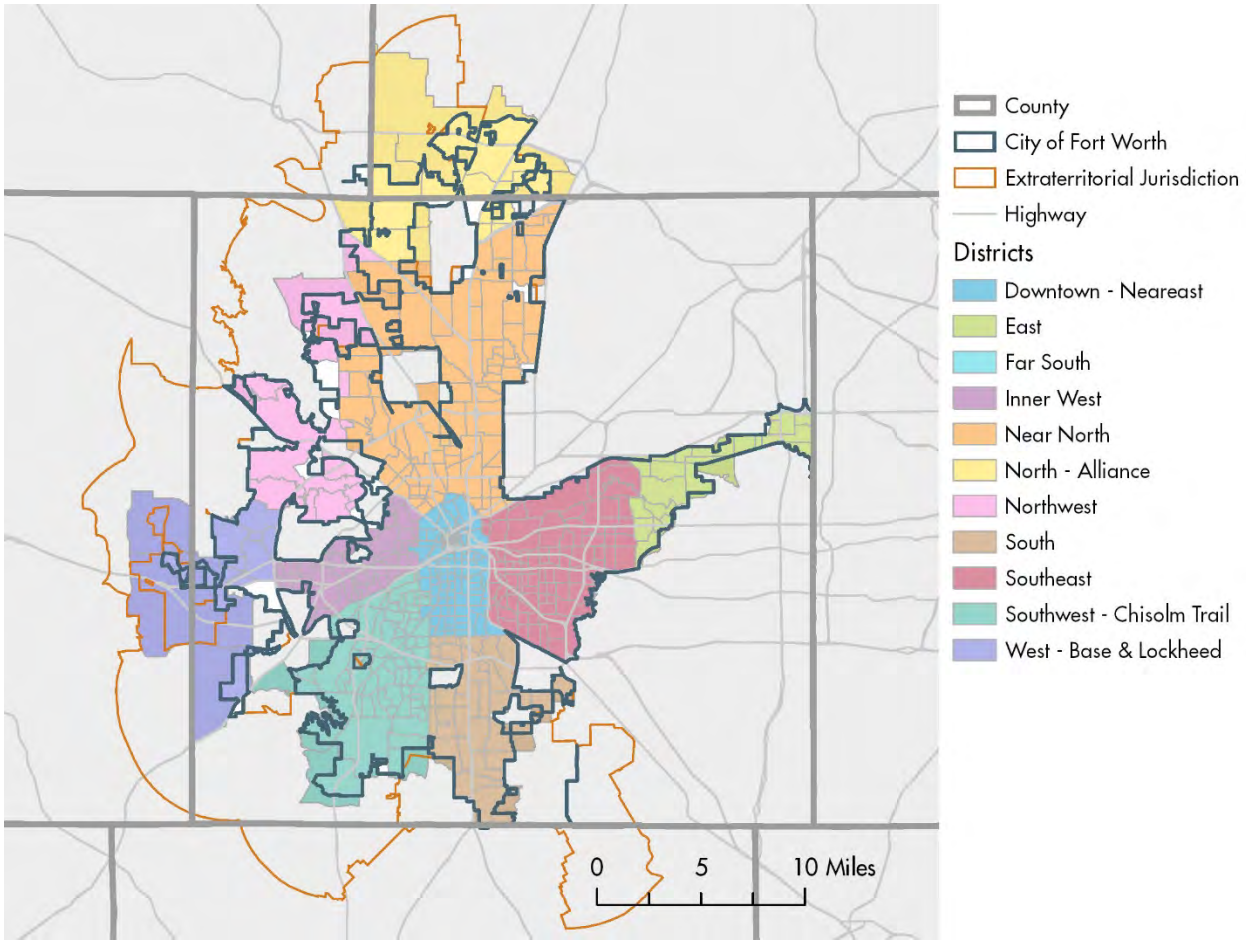
Source: Fregonese Associates (FA) scenario analysis; NCTCOG Regional Forecast for 2040

FIGURE 109. EMPLOYMENT TYPE BY SUB AREA

SUB AREAS	FA GROWTH TARGET (INCREMENT)	RETAIL %	OFFICE %	INDUSTRIAL %
Downtown-Near East	118,037	8%	90%	2%
East	21,613	13%	42%	45%
Inner West	26,133	2%	70%	28%
Near North	114,272	27%	34%	39%
North-Alliance	95,490	10%	39%	51%
Northwest	15,260	37%	33%	30%
South	59,295	10%	34%	56%
Southeast	26,966	29%	35%	36%
Southwest-Chisholm Trail	46,520	65%	35%	0%
West-Base & Lockheed	23,607	33%	65%	2%
Citywide Total	**574,193**	**20%**	**45%**	**35%**

Source: Fregonese Associates (FA) scenario analysis; NCTCOG Regional Forecast for 2040

FIGURE 110. FA GROWTH TARGET SUB AREA MAP



Source: Fregonese Associates

9. ENTREPRENEURIAL ECOSYSTEM

While the idea of supporting small business and entrepreneurship is often presented as unified strategy, there is value in making a distinction between the two concepts. This differentiation is particularly important when thinking about policies and programs. Entrepreneurial ventures and small businesses often serve different markets. They face different challenges, requiring distinctly different solutions.

FIGURE 111. ENTREPRENEURSHIP FRAMEWORK

	Entrepreneurial Companies	Small Business
Characteristics	• Export oriented • Capital intensive • Intellectual property (IP) dependent • High-growth	• Serves local markets • Low capitalization • No proprietary information • Modest growth expectations
Tools/Assistance Required	• University science & engineering programs • Technology transfer centers • Venture capital (VC) funds • Legal assistance (intellectual property, etc.) • Business plan competitions • Experienced labor pools of managers	• Small business development centers (SBDCs) • SCORE-type counseling services • Small business incubators & executive suites • Micro-lending & small business loan programs • Basic legal, accounting, & business plan advice

Source: TIP Strategies

Interviews with key players in Fort Worth's small business and entrepreneurship community, combined with the consulting team's experience, were used to identify the major components of the city's entrepreneurial ecosystem and to prepare a high-level analysis of the city's strengths, weaknesses, opportunities, and threats (SWOT) in this area. The diagram in Figure 113 presents highlights of Fort Worth's entrepreneurial ecosystem. Hayden Blackburn, assistant director of Tech Fort Worth, has compiled a more extensive map of the Dallas-Fort Worth metro area assets using MindMeister, an online mapping application at the following url: http://bit.ly/DFWBusinessResources.

FIGURE 112. ENTREPRENEURIAL SWOT ANALYSIS

STRENGTHS

- The City has several third-party support entities for entrepreneurship and small business development (e.g., TECH Fort Worth, IDEA Works FW) and a long history of supporting entrepreneurship (the City's Business Assistance Center was founded 1998), many of which are co-located at the James E. Guinn Entrepreneurial Campus
- Cowtown Angels (program of TECH Forth Worth) has had two recent IPOs in healthcare (ZS Pharma, Encore Vision) and has achieved recognition nationally
- TECH Fort Worth's recent IPOs medical and technology areas represent a significant strength for the metro area
- Fort Worth's "wildcatter" heritage produces lots of risk-taking business people
- There is a great deal of private capital in the city
- TCU has robust entrepreneurship offerings at the undergrad level (~150 entrepreneurship management majors/year)
- Growth/emergence of mixed-use urban districts and corridors (e.g., Magnolia Avenue, West 7th Street) with amenities desired by entrepreneurs and creative workers

WEAKNESSES

- Despite the city's high level of private capital, the families and individuals that control this wealth are not well-connected with investment opportunities, particularly in technology
- City engagement with entrepreneur support organizations (ESOs), including the BAC, is not "mediated by metrics"
- Lack of internal coordination between City/Chamber business recruitment program and local ESOs' efforts to support growth of startups and smaller tech-focused operations (including small tech operations for larger companies)
- Lack of strategic process or coordinated marketing across entrepreneur support community
- Region's coworking space is concentrated in Dallas and northern suburbs
- Fort Worth has gaps in capital access, particularly in seed and Series A funding
- Lack of large successful technology companies means there's a lack of "natural acquirers" that will reinvest in tech startups in the city. This also means there are fewer mentors
- A shortage of technical talent, including developers, coders, etc., and difficulty retaining local graduates (e.g., UT-Dallas) limits growth in Fort Worth

OPPORTUNITIES

- Connecting private risk capital with investment opportunities to boost access to capital for Fort Worth entrepreneurs
- Leveraging the abundant "old money" in the city to create a Fort Worth-based venture capital (VC) fund to serve as an investment vehicle for high-net worth individuals (similar to Iconiq Capital in San Francisco which is funded by Facebook CEO Mark Zuckerberg, Facebook COO Sheryl Sandberg, Napster founder Sean Parker, and Twitter/ Square CEO Jack Dorsey)
- Adopting rigorous metrics to measure impact of city dollars (e.g., City of Austin–ATI model)
- Expanding coworking space (several currently in the works) to provide physical space and centers of gravity for the entrepreneurial community
- Offering software training bootcamps to increase availability of this training in Fort Worth
- Identifying an organization that can play a "convener" role to better coordinate the ecosystem
- Encouraging a higher level of seed capital (e.g., reverse pitch events to support entrepreneurship)
- Better connecting UTARI (UT-Arlington Research Institute) to businesses and entrepreneurs in Fort Worth
- Leveraging Fort Worth's large corporate employers (e.g., American Airlines, BNSF, Lockheed Martin, Bell Helicopter, Alcon Laboratories) to pursue a higher level of spin-outs and technology commercialization
- Creating and formalizing an "innovation district" in the Near Southside medical district with new and expanded incentives, programs, and policies to fuel entrepreneurship and the growth of innovative companies
- Capitalizing on the lack of a single geographic concentration of technology firms, startups, and entrepreneurs (similar to the Route 128 corridor in Boston) to make a specific district within Fort Worth the metro area's "go to" spot for entrepreneurship and innovation
- Pursuing other sectors that represent significant opportunity to diversify emerging industry base (oil and gas, aerospace (manufacturing and design), and transportation/logistics)

THREATS

- The lack of a major research university (with more than $500 million in annual academic R&D investments) in the Dallas-Fort Worth metro area limits potential for university-related entrepreneurship and technology commercialization.
- Relatively under-developed VC funding network in Texas, and especially in the Dallas-Fort Worth metro area (roughly half of VC funding in Texas is in the Austin metro area), limits the potential for high-growth firms and tech startups.
- Leadership transition at IDEA Works FW means the organization may be unsettled for a period. This could affect pipeline.
- Uncertainty surrounding regulatory reforms (including tax reforms) may affect deal flow in the short term.

FIGURE 113. FORT WORTH ENTREPRENEURIAL ECOSYSTEM

Venture capital (VC) funding is the feedstock for high-growth companies and entrepreneurs. Nationally, VC funding is highly concentrated in a small group of technology-driven metro areas. The combined San Francisco/San Jose area accounts for more than $30 billion of VC investment in 2016, out of a roughly $70 billion US total. Add in the New York, Boston, and Los Angeles markets and this group of metro areas accounts for nearly $50 billion of VC deal value, about 70 percent of all VC investment. The DFW area captured $678 million in VC investment in 2016, less than 1 percent of the US total, compared with $977 million in Austin, the top Texas VC market. The Dallas-Fort Worth metro area lags other major metros in access to risk capital for entrepreneurs. Fort Worth—and its latent "old money" wealth—could play a role in filling this gap to provide more funding sources for area entrepreneurs.

FIGURE 114. VENTURE CAPITAL (VC) DEAL FLOW, 2016
TOP MSAS RANKED BY DEAL VALUE

	MSA	Company Count	Deal Count	Deal Value ($M)	Avg. Deal Value ($M) *calculated*
1	San Francisco-Oakland-Fremont, CA MSA	1,323	1,393	$23,400.81	$16.80
2	New York-Northern New Jersey-Long Island, NY-NJ-PA MSA	888	940	$7,565.29	$8.05
3	San Jose-Sunnyvale-Santa Clara, CA MSA	478	496	$6,717.52	$13.54
4	Boston-Cambridge-Quincy, MA-NH MSA	500	527	$6,028.50	$11.44
5	Los Angeles-Long Beach-Santa Ana, CA MSA	496	526	$5,445.52	$10.35
6	San Diego-Carlsbad-San Marcos, CA MSA	200	207	$1,548.83	$7.48
7	Seattle-Tacoma-Bellevue, WA MSA	265	282	$1,502.93	$5.33
8	Miami-Fort Lauderdale-Pompano Beach, FL MSA	91	94	$1,295.76	$13.78
9	Chicago-Naperville-Joliet, IL-IN-WI MSA	220	227	$1,245.25	$5.49
10	Washington-Arlington-Alexandria, DC-VA-MD-WV MSA	191	199	$1,089.80	$5.48
11	Austin-Round Rock, TX MSA	182	188	$977.22	$5.20
12	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD MSA	149	154	$896.98	$5.82
13	Atlanta-Sandy Springs-Marietta, GA MSA	111	119	$753.98	$6.34
14	Dallas-Fort Worth-Arlington, TX MSA	138	143	$678.29	$4.74
15	Salt Lake City, UT MSA	53	55	$632.55	$11.50
16	Provo-Orem, UT MSA	36	41	$548.75	$13.38
17	Denver-Aurora, CO MSA	124	134	$501.56	$3.74
18	Minneapolis-St. Paul-Bloomington, MN-WI MSA	77	82	$490.94	$5.99
19	Boulder, CO MSA	84	86	$368.19	$4.28
20	Durham, NC MSA	42	44	$351.14	$7.98
21	Santa Barbara-Santa Maria-Goleta, CA MSA	29	32	$336.84	$10.53
22	Nashville-Davidson-Murfreesboro-Franklin, TN MSA	56	58	$317.68	$5.48
23	Portland-Vancouver-Beaverton, OR-WA MSA	74	77	$297.08	$3.86
24	Phoenix-Mesa-Scottsdale, AZ MSA	73	81	$268.99	$3.32
25	Baltimore-Towson, MD MSA	64	69	$254.63	$3.69

Sources: National Venture Capital Association, "NVCA 2017 Yearbook Data Pack (Public Version)"; TIP Strategies.

10. BENCHMARKING

Benchmarks provide context, but selecting benchmarks is always, to some extent, a subjective process. There are, however, ways to make these types of decisions more systematic and transparent. The eight domestic and eight international benchmarks presented in this section were agreed upon through a series of stakeholder meetings between the TIP consulting team and the City of Fort Worth. All eight of the domestic benchmarks assessed were intentionally inland rather than coastal cities, as this was seen as a critically important factor in Fort Worth's identity, history, and economy. Of the eight international benchmarks chosen, four were also inland cities, including two in Germany, and one each in Canada and France. Montreal is also *technically* an inland city, though it functions more as coastal gateway than an inland hub due to its remote location and its near-Atlantic port on the St. Lawrence River. The remaining three international benchmarks (two in the UK and one in Australia) were coastal cities and showed generally less alignment with Fort Worth based on the criteria reviewed. Figure 115 shows the 12 qualitative characteristics considered in this analysis and how the 16 benchmarks overlapped with Fort Worth based on these concepts.

FIGURE 115. GENERAL SELECTION CRITERIA FOR DOMESTIC & INTERNATIONAL BENCHMARKS

		Frankfurt	Pittsburgh	Columbus	Denver	Oklahoma City	Leipzig	Montreal	Nashville	Kansas City	Calgary	Indianapolis	Toulouse	Glasgow	Perth	Phoenix	Liverpool
		6	5	5	4	4	3	3	3	3	2	2	2	2	2	1	1
Inland transportation crossroads	12	+	+	+	+	+	+		+	+	+	+	+			+	
Downtown or corridor renaissance	7		+	+	+	+		+	+					+			
Recognized center of higher education and/or medicine	6	+	+	+			+	+	+								
Similar population size (metro)	5	+	+		+					+					+		
Energy/oil & gas legacy	4				+	+					+				+		
Regional "twin city" challenges	3									+				+			+
Military air base	3	+		+		+											
Similar population size (city)	2			+								+					
Aerospace/defense manufacturing legacy	2							+					+				
Air cargo hub	2	+					+										
Global air passenger hub	1	+															
Cultural legacy of private investment in arts & sciences	1		+														

Source: TIP Strategies research.

INTERNATIONAL & DOMESTIC BENCHMARKS

Figure 116 includes supplemental reading materials for this section. This list contains selected, relevant articles reviewed during the consultants' benchmark assessment. It is organized alphabetically by city for the 16 domestic and international benchmarks.

FIGURE 116. RELEVANT REFERENCE ARTICLES FOR THE DOMESTIC & INTERNATIONAL BENCHMARKS

CALGARY

- "University District launches new discovery centre this weekend," *Calgary Herald*, March 10, 2017.
- "Calgary's University District plan gets green stamp of approval," *Globe and Mail*, September 2, 2016.
- "Calgary Harnesses Its Logistics Energy," *Journal of Commerce*, February 12, 2014.

COLUMBUS

- "Study envisions Columbus convention center 'district,' hotel expansions," *Columbus Dispatch*, May 24, 2017.
- "RiverSouth Transforms from Downtown Wasteland to Vibrant District," *Columbus Dispatch*, May 17, 2016.

DENVER

- "Denver's Gritty Back Door Could Become Its New Gateway," *New York Times*, December 27, 2016.
- "Capitalizing on TOD," *Urban Land*, December 8, 2016.
- "Report: Downtown Denver is vibrant with investment," *Denver Post*, September 11, 2013.

FRANKFURT

- "Frankfurt and Offenbach: A Future Model for Regional Cooperation," *Urban Land*, August 3, 2015.
- "Business coups help raise Frankfurt's profile," *Financial Times*, April 17, 2014.
- "A Mobility Wunderkind: Transportation lessons from Germany," *Planning*, December 2013.
- "Fuel Costs, Market Shifts Challenge Hub Paradigm," *Aviation Week & Space Technology*, July 8, 2013.

GLASGOW

- "Innovation and infrastructure plan to create 50,000 new jobs in Glasgow," *Scottish Construction Now*, November 25, 2016.
- "Glasgow: a start-up hotspot," *Financial Times*, October 7, 2014.
- "Glasgow city centre action plan unveiled," BBC, May 16, 2013.

INDIANAPOLIS

- "Is Indianapolis Becoming the Silicon Valley of the Midwest?" *Governing*, March 20, 2017.
- "How Indianapolis, Long Known as a Manufacturing Center, Is Luring Tech Talent," *New York Times*, January 17, 2017.

KANSAS CITY

- "Start-Up Upstart: Lacking the trappings of a typical tech hub, Kansas City gets decidedly DIY," *Planning*, October 2016.
- "Did an American City Finally Build a Good Streetcar?" *Slate*, August 2, 2016.
- "Millennials Going to Kansas City, to Live and Work," *New York Times*, August 19, 2014.
- "Planning group exec says KC must grow as region, not separate cities," *Kansas City Star*, October 15, 2012.

LEIPZIG

- "Rapid growth and need for speed fuels DHL's Leipzig investment," *Air Cargo News*, October 29, 2016.
- "Leipzig: the new Berlin?" *Deutsche Welle*, January 2, 2013.
- "Calling All Hipsters: Leipzig Is the New Berlin," *Spiegel*, October 24, 2012.
- "Seamless connections: Leipzig, Germany has multiple transportation modes, and transitions are smooth," *Fort Worth Star-Telegram*, May 14, 2012.

LIVERPOOL

- "Shaking Off Downturn, Liverpool Has Big Plans," *New York Times*, December 19, 2013.
- "Liverpool steams ahead with development plan," *Financial Times*, March 11, 2012.

MONTREAL

- "Montreal sees its future in smart sensors, artificial intelligence," *Computerworld*, February 6, 2017.
- "How does innovation come to life at McGill?" *McGill Reporter*, June 8, 2016.
- "CSX to build $100-million terminal in Quebec," *Globe & Mail*, January 25, 2013.
- "Urban planners were saviours of our city," *Montreal Gazette*, September 22, 2012.

NASHVILLE

- "NashvilleNext, Nashville-Davidson County," *Planning*, April 2016.
- "City Living Comes to Downtown Nashville," *Wall Street Journal*, November 6, 2014.
- "Nashville's Latest Big Hit Could Be the City Itself," *New York Times*, January 8, 2013.

OKLAHOMA CITY

- "Positioned for growth: Advancing the Oklahoma City innovation district," *Brookings Institution*, April 18, 2017.
- "How Oklahoma City Avoided Economic Pitfalls," *National Public Radio*, January 19, 2012.
- "Oklahoma City reaps positive effects of economic development," *The Oklahoman*, January 1, 2012.
- "A 180° Turnaround," *Planning*, May 2011.

PERTH

- "City summit to revive Perth CBD dead zones," *West Australian*, April 1, 2017.
- "The changing face of Perth - modern and booming," *The Australian*, May 18, 2013.

PHOENIX

- "Phoenix Focuses on Rebuilding Downtown, Wooing Silicon Valley," *New York Times*, June 18, 2016.
- "Phoenix Rises Again," *Planning*, January 2016.
- "Growing bioscience hub in Valley deserves support," *Arizona Republic*, August 6, 2012.
- "Raising Phoenix," *Urban Land*, April 12, 2011.

PITTSBURGH

- "Coming-out party for Mellon Square," *Pittsburgh Post-Gazette*, May 27, 2014.
- "A Vision for the Rivers," *Pittsburgh Magazine*, April 14, 2014.
- "Bill Peduto wants to make Pittsburgh's Smithfield Street a 'grand boulevard'," *Pittsburgh Post-Gazette*, October 20, 2013.
- "Pittsburgh's Three Rivers, Now a Public Attraction," *New York Times*, January 22, 2013.
- "Upheaval and losses hurt, but Downtown Pittsburgh emerged from economic turmoil renewed," *Pittsburgh Post-Gazette*, December 30, 2012.

TOULOUSE

- "Toulouse to be EADS 'centre of gravity'," *Financial Times*, February 10, 2012.
- "Aerospace: Valley where the businesses grow wings," *Financial Times*, October 3, 2007.

Figure 117 shows the populations of the city of Fort Worth and the Fort Worth MD to the 16 benchmarks at the municipal and metropolitan levels. Fort Worth (city) is closest in population to Columbus, Ohio and Indianapolis, Indiana. The Fort Worth MD falls just between Frankfurt, Germany and Pittsburgh, Pennsylvania. About one in three residents (35 percent) of the Fort Worth MD live within the Fort Worth city limits, which is about the same ratio as Phoenix and Nashville.

FIGURE 117. 2016 POPULATION*

	Municipality	Metropolitan area	City as a % of metro
Fort Worth [1, 2]	**854,113**	**2,439,674**	**35%**
Montreal [3, 4]	1,704,694	4,093,800	42%
Phoenix [1,5]	1,615,017	4,661,537	35%
Calgary [3, 4]	1,239,220	1,469,300	84%
Columbus [1,5]	860,090	2,041,520	42%
Indianapolis [1,5]	855,164	2,004,230	43%
Toulouse [6, 7]	734,976	1,337,098	55%
Frankfurt [8, 7]	717,624	2,606,836	28%
Denver [1,5]	693,060	2,853,077	24%
Nashville [1,5]	660,388	1,865,298	35%
Oklahoma City [1,5]	638,367	1,373,211	46%
Glasgow [8, 7]	602,990	1,821,971	33%
Leipzig [8, 7]	544,479	999,168	54%
Kansas City [1,5]	481,420	2,104,509	23%
Liverpool [8, 7]	475,827	1,519,703	31%
Pittsburgh [1,5]	303,625	2,342,299	13%
Perth [9, 10]	33,406	2,066,564	2%

*2016 population figures unless otherwise noted in source data below.
Sources: Each city contains two footnotes, the first is the municipal data source, and the second is the metropolitan data source. The ratio of city-to-metropolitan population was calculated by TIP Strategies.
1. US Census Bureau, Annual Estimates of the Resident Population: 2016 Population Estimates (place level)
2. US Census Bureau, Annual Estimates of the Resident Population: 2016 Population Estimates (MD level)
3. Statistics Canada, Population, municipalities (census subdivisions) in Canada with at least 200,000 inhabitants, 2016
4. Statistics Canada, Population of census metropolitan areas, 2016 estimate
5. US Census Bureau, Annual Estimates of the Resident Population: 2016 Population Estimates (MSA level)
6. Eurostat, Population on 1 January 2013 by age groups and sex–cities and greater cities
7. Eurostat, Population on 1 January 2015 by five-year age group, sex, and metropolitan regions
8. Eurostat, Population on 1 January 2015 by age groups and sex–cities and greater cities
9. Australian Bureau of Statistics, 3218.0–Regional Population Growth, Australia, 2015-16 (SA2)
10. Australian Bureau of Statistics, 3218.0–Regional Population Growth, Australia, 2015-16 (GCCSA)

Fort Worth lies at the intersection of three US Interstate highways and the two dominant Class I railroads of the Western US: Union Pacific (UP) and Burlington Northern Santa Fe (BNSF). Figure 118 shows how other domestic benchmarks compare in their transportation capacities with Class I railroads and US Interstate highways. Apples-to-apples comparisons across international borders can pose challenges. In Europe, the corridors designated as TEN-T priorities are listed as the nearest equivalent transportation comparisons. (It is worth noting, too, that while Europe's *passenger* rail system has a reputation for being sophisticated and extensive compared with the US, the European continent's *freight* rail system is much less developed and integrated than it is in North America.)

FIGURE 118. SURFACE TRANSPORTATION CONNECTIVITY

	NORTH AMERICA		EUROPE
CITY	Major Highways	Class I Railroads	TEN-T Corridors
Fort Worth	**I-20 • I-30 • I-35W**	**BNSF • UP***	**—**
Calgary	Trans-Canada	CN • CP	—
Columbus	I-70 • I-71	CSX • NS	—
Denver	I-70 • I-76 • I-25	BNSF • UP	—
Frankfurt	—	—	North Sea-Baltic • Rhine-Alpine • Rhine-Danube
Glasgow	—	—	North Sea-Mediterranean (before Brexit)
Indianapolis	I-65 • I-69 • I-70 • I-74	CSX	—
Kansas City	I-70• I-35 • I-29 • I-49	BNSF • UP • KCS • NS	—
Leipzig	—	—	Scandinavian-Mediterranean • Orient-East Med
Liverpool	—	—	North Sea-Mediterranean (before Brexit)
Montreal	Trans-Canada	CN • CP	—
Nashville	I-40 • I-65 • I-24	CSX	—
Oklahoma City	I-35 • I-40 • I-44	BNSF • UP	—
Perth	**	**	See Note 2
Phoenix	I-8 • I-10 • I-17	BNSF • UP	—
Pittsburgh	I-70 • I-76 • I-79	CSX • NS • CN	—
Toulouse	—	—	none

Source: TIP Strategies research.
*A KCS connection to the local Class I network lies within the Dallas MD.
**Australia lacks comparable equivalents for the US interstate highways, the Trans-Canada highway, North American Class I railways, and European TEN-T corridors.

Figure 119 and Figure 120 catalog the educational institutions and medical schools in Fort Worth and in the domestic and international benchmark cities. These are provided for reference purposes.

FIGURE 119. HIGHER EDUCATION

CITY	INSTITUTIONS	
Fort Worth	• Texas Christian University • Texas Wesleyan University • Tarrant County College • Southwestern Baptist Theological Seminary • Tarleton State University, Fort Worth campus	• Texas A&M University School of Law • Texas College of Osteopathic Medicine • University of North Texas Health Science Center at Fort Worth • University of Texas at Arlington, Fort Worth campus
Calgary	• University of Calgary • Mount Royal College • Bow Valley College	• Southern Alberta Institute of Technology • DeVry Institute of Technology
Columbus	• Ohio State University • Ohio State University College of Medicine • Ohio Dominican University • Franklin University	• Capital University • Capital University Law School • Columbus College of Art and Design • DeVry University, Columbus
Denver	• University of Denver • University of Colorado at Denver • University of Colorado School of Medicine • Community College of Denver	• Rocky Mountain College of Art and Design • Regis University • Metropolitan State University of Denver
Frankfurt	• Johann Wolfgang Goethe Universität Frankfurt am Main • Philosophisch-Theologische Hochschule Sankt Georgen	• Fachhochschule Frankfurt am Main • Hochschule für Bankwirtschaft (HfB), Private Fachhochschule der Bankakademie
Glasgow	• University of Glasgow • Glasgow School of Art	• University of Strathclyde • Glasgow Caledonian University
Indianapolis	• Indiana University-Purdue University at Indianapolis • Butler University • University of Indianapolis	• Marian College • Martin University • ITT Technical Institute Indianapolis
Kansas City	• University of Missouri, Kansas City • University of Health Sciences • St. Luke's College • Rockhurst University • Kansas City Art Institute	• National American University, Kansas City • Avila College • Calvary Bible College • DeVry Institute of Technology, Kansas City
Leipzig	• Universität Leipzig • Hochschule für Technik, Wirtschaft und Kultur Leipzig (FH) • Handelshochschule Leipzig	• AKAD Hochschulen für Berufstätige, Fachhochschule Leipzig • Deutsche Telekom Fachhochschule Leipzig
Liverpool	• Liverpool Hope University College /Liverpool John Moores University	• University of Liverpool

CITY	INSTITUTIONS	
Montreal	• McGill University • Université de Montréal • Université du Québec à Montréal • Institut National de la Recherche Scientifique, Université du Québec • Concordia University • Télé-université, Université du Québec	• École des Hautes Études Commerciales • École de technologie supérieure, Université du Québec • École nationale d'administration publique, Université du Québec • École Polytechnique de Montréal, Université de Montréal
Nashville	• Vanderbilt University • Belmont University • Tennessee State University • Fisk University	• Meharry Medical College • Lipscomb University • Free Will Baptist Bible College • Trevecca Nazarene University
Oklahoma City	• University of Oklahoma Health Sciences Center • Oklahoma State University, Oklahoma City • Oklahoma City University	• Southwestern Christian University/Oklahoma Christian University • Mid-American Bible College
Perth	• University of Western Australia • Murdoch University	• Curtin University of Technology • Edith Cowan University
Phoenix	• Arizona State University, Downtown Phoenix Campus • Arizona State University, West Campus • Arizona State University, Tempe campus (suburb) • University of Advancing Technology • American Indian College • Grand Canyon University	• Western International University • Arizona Christian University • University of Phoenix • Western Bible College • DeVry Institute of Technology, Phoenix
Pittsburgh	• Carnegie Mellon University • University of Pittsburgh • Duquesne University • Carlow College	• Chatham College • La Roche College • Point Park College • Robert Morris College
Toulouse	• Ecole Nationale de la Météorologie • Ecole Nationale de l'Aviation Civile • Ecole Nationale Supérieur d'Ingénieurs de Constructions Aéronautique • Ecole Nationale Supérieure Agronomique de Toulouse • Ecole Nationale Supérieure de Chimie de Toulouse • Ecole Nationale Supérieure de l'Aéronautique et de l'Espace • Ecole Nationale Supérieure d'Electronique, d'Electrotechnique, d'Informatique et d'Hydraulique de Toulouse • École Nationale Supérieure d'Ingénieurs de Constructions Aéronautiques • Ecole Nationale Supérieure d'Ingénieurs de Génie Chimique	• Ecole Nationale Supérieure en Electrotechnique, Electronique, Informatique et Hydraulique de Toulouse • Ecole Nationale Vétérinaire de Toulouse • Ecole Supérieure d'Agriculture de Purpan • Ecole Supérieure de Commerce de Toulouse • Institut Catholique de Toulouse • Institut National des Sciences Appliquées de Toulouse • Institut National Polytechnique de Toulouse • Université des Sciences Sociales (Toulouse I) • Université de Toulouse • Université de Toulouse-le-Mirail (Toulouse II) • Université Paul Sabatier (Toulouse III)

FIGURE 120. MEDICAL SCHOOLS

CITY	INSTITUTIONS
Fort Worth	• University of North Texas Health Science Center • Texas College of Osteopathic Medicine • TCU and UNTHSC School of Medicine
Calgary	• Cumming School of Medicine, University of Calgary
Columbus	• Ohio State University College of Medicine
Denver	• University of Colorado School of Medicine (Aurora, suburb)
Frankfurt	• Goethe-Universität Frankfurt am Main Fachbereich Medizin
Glasgow	• University of Glasgow School of Medicine
Indianapolis	• Indiana University School of Medicine • Marian University College of Osteopathic Medicine
Kansas City	• Kansas City University of Medicine & Biosciences College of Osteopathic Medicine (Missouri) • University of Missouri Kansas City School of Medicine (Missouri) • University of Kansas School of Medicine (Kansas)
Leipzig	• Universität Leipzig Medizinische Fakultät
Liverpool	• University of Liverpool Faculty of Health and Life Sciences
Montreal	• McGill University Faculty of Medicine • Université de Montréal Faculté de Médecine
Nashville	• Vanderbilt University School of Medicine • Meharry Medical College School of Medicine
Oklahoma City	• University of Oklahoma College of Medicine
Perth	• University of Western Australia Faculty of Medicine, Dentistry, and Health Sciences
Phoenix	• University of Arizona College of Medicine Phoenix
Pittsburgh	• University of Pittsburgh School of Medicine
Toulouse	• Faculté de Médecine Toulouse-Purpan • Faculté de Médecine Toulouse-Rangueil

Figures 121-122 attempt to assemble a comparative overview of the office and industrial markets in Fort Worth and the benchmark metropolitan areas as of 2017 Q1. While it was impossible to reconstruct a cross-city dataset of perfect comparability, particularly for cities outside the US, the figures below come relatively close to full comparison, especially for office properties (where there were fewer gaps than in the industrial sector).

FIGURE 121. OFFICE REAL ESTATE AS OF 2017 Q1*

City	Inventory (msf)	Under Construction (msf)	Construction Rate (%)	Vacancy (%)
Fort Worth [1]	**41.7**	**1.1**	**2.6%**	**16.6%**
Frankfurt [1]	125.5	3.7	2.9%	9.0%
Denver [1]	109.0	4.1	3.8%	14.2%
Montreal [1]	97.0	1.3	1.3%	13.0%
Phoenix [1]	86.0	1.3	1.5%	19.9%
Calgary [1]	68.4	3.1	4.5%	20.2%
Pittsburgh [1]	50.4	0.4	0.8%	16.3%
Kansas City [2]	50.0	0.3	0.0	17.0%
Toulouse [3]	46.7	—	—	5.2%
Leipzig [4]	40.3	0.3	0.8%	8.9%
Nashville [1]	35.2	2.4	6.8%	8.1%
Indianapolis [1]	32.3	0.5	1.4%	17.3%
Columbus [1]	28.8	1.0	3.6%	12.7%
Oklahoma City [2]	21.6	0.9	4.1%	13.4%
Glasgow [1]	16.0	0.0	0.0%	8.3%
Liverpool [1]	—	—	—	—
Perth [1]	—	—	—	—

*Figures are from 2107 Q1 unless elsewhere noted
Sources:
1. JLL
2. Cushman Wakefield
3. JLL (as of 2016 Q4)
4. BNP Paribas

FIGURE 122. INDUSTRIAL REAL ESTATE AS OF 2017 Q1

City	Inventory (msf)	Under Construction (msf)	Construction Rate (%)	Vacancy (%)
Fort Worth [1]	**207.0**	**10.0**	**4.8%**	**6.0%**
Phoenix [2]	262.3	3.8	1.5%	8.8%
Columbus [2]	225.4	2.6	1.2%	5.3%
Indianapolis [2]	213.5	5.1	2.4%	6.7%
Denver [2]	201.8	4.8	2.4%	4.4%
Nashville [2]	200.9	4.5	2.2%	4.0%
Pittsburgh [2]	138.4	0.1	0.1%	8.3%
Toulouse [3]	74.3	3.7	5.0%	3.0%
Liverpool [4]	34.6	0.0	0.0%	3.0%
Glasgow [5]	7.9	0.0	0.0%	3.0%
Kansas City [1]	—	5.5	—	5.3%
Perth [1]	—	0.5	—	—
Calgary [1]	—	—	—	—
Frankfurt [1]	—	—	—	—
Leipzig [1]	—	—	—	—
Montreal [1]	—	—	—	—
Oklahoma City [1]	—	—	—	—

Sources:
1. JLL (Note: Fort Worth (metro) is defined as the aggregation North Fort Worth, South Fort Worth, and GSW/Arlington submarkets included in JLL's Dallas industrial market report)
2. JLL
3. JLL; Observatoire Toulousain d'Immobilier d'Entreprise (Otie)
4. JLL (includes all Northwest England but limited to modern buildings of 100,000 SF or larger)
5. JLL (includes all of Scotland but limited to modern buildings of 100,000 SF or larger)

DOMESTIC BENCHMARKS: EMPLOYMENT PATTERNS

Figure 123 provides a high-level visual reference for metropolitan employment structures. The Fort Worth MD and its domestic benchmarks are set to the same scale, with large bubbles representing major employing sectors of the local economy. A visual representation provides a quick way to grasp some key points that might otherwise be obscured by the details. For example, Oklahoma City is clearly a smaller employment market than Fort Worth or any of the other domestic benchmarks, and its placement next to (much larger) Phoenix makes this point quite clear. But look closely at these bubbles and there are other messages become apparent, such as the relatively small size of Fort Worth's professional services sector relative to other benchmarks, especially Denver and Kansas City.

FIGURE 123. 2016 EMPLOYMENT STRUCTURES BY SECTOR IN THE FORT WORTH MD & BENCHMARKS

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies
Note: Circle sizes are proportional to the number of jobs in 2016. Scales are equal across all the metropolitan areas.

Questions that may have been raised about sector employment comparisons in Figure 123 can be further explored in Figure 124, where the actual employment numbers behind those bubbles are presented in tabular form. Fort Worth leads all its domestic benchmarks in employment in the transportation & warehousing sector; it ranks second only to Phoenix in manufacturing and second only to Oklahoma City in oil, gas, & mining. But Figure 124 also indicates Fort Worth's lack of competitiveness in office-using sectors like corporate & regional offices, where it ranks last in employment among the benchmark communities. In the information sector, Fort Worth trails all the benchmarks, except for Oklahoma City, and its employment total in this sector is barely one-quarter that of Denver. Professional services employment in Fort Worth also trails all the benchmarks except for Oklahoma City. Even healthcare, Fort Worth's largest employing sector, lags all benchmarks, save Oklahoma City.

FIGURE 124. 2016 EMPLOYMENT BY SECTOR IN THE FORT WORTH MD & THE PEER MSAs

	Fort Worth, TX (MD)	Columbus, OH (MSA)	Denver, CO (MSA)	Indianapolis, IN (MSA)	Kansas City, MO (MSA)	Nashville, TN (MSA)	Oklahoma City, OK (MSA)	Phoenix, AZ (MSA)	Pittsburgh, PA (MSA)
Healthcare & social assistance	126,467	150,718	179,304	142,227	145,337	127,348	80,985	255,610	195,079
Retail trade	120,109	105,637	143,311	111,822	114,547	102,115	70,649	241,331	129,884
Lodging, restaurants, & bars	98,670	91,644	137,582	92,445	89,904	92,794	61,504	183,451	97,724
Manufacturing	93,896	72,922	71,112	90,972	77,958	82,010	36,075	121,757	86,923
Educational services	92,358	107,518	127,228	82,612	86,906	73,766	62,580	165,899	117,933
Transportation & warehousing	83,826	56,247	59,229	65,587	53,422	45,239	21,313	74,850	46,313
Construction	70,925	46,051	104,495	56,297	57,098	52,026	38,728	125,849	64,621
Administrative & support services	70,861	80,572	104,337	89,907	69,570	76,221	42,735	210,557	56,997
Personal & other services	61,910	49,936	73,019	55,444	53,513	51,103	33,467	94,712	60,692
Wholesale trade	47,537	36,667	72,688	43,819	47,734	37,615	24,920	76,077	38,438
Professional services	46,130	66,239	145,677	59,668	93,867	64,535	37,368	125,700	86,496
Finance & insurance	43,889	60,817	77,823	47,350	61,128	44,520	25,004	132,698	56,823
Local government	28,947	35,657	50,507	27,995	36,726	27,654	17,981	69,065	34,595
Arts, entertainment, & recreation	19,588	16,324	28,571	16,819	19,036	18,649	10,217	37,331	23,630
Property sales & leasing	18,018	15,965	32,963	17,801	17,579	18,302	10,716	49,379	16,261
Oil, gas, & mining	14,556	860	10,396	638	769	618	17,043	3,221	8,693
Information	12,475	16,474	47,893	16,149	18,579	22,897	8,582	37,826	17,423
Federal government (civilian)	11,366	10,514	22,160	12,557	22,038	9,995	25,811	15,322	11,488
Corporate & regional offices	6,686	36,051	30,253	13,411	27,142	20,051	9,420	28,084	38,198
State government	3,681	25,317	17,416	15,945	6,692	18,458	18,983	27,033	8,579
Agriculture & forestry	3,409	5,323	4,297	5,658	4,788	2,626	2,217	10,219	2,053
Utilities	3,056	4,560	3,768	3,592	4,737	1,221	2,804	8,265	5,828

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

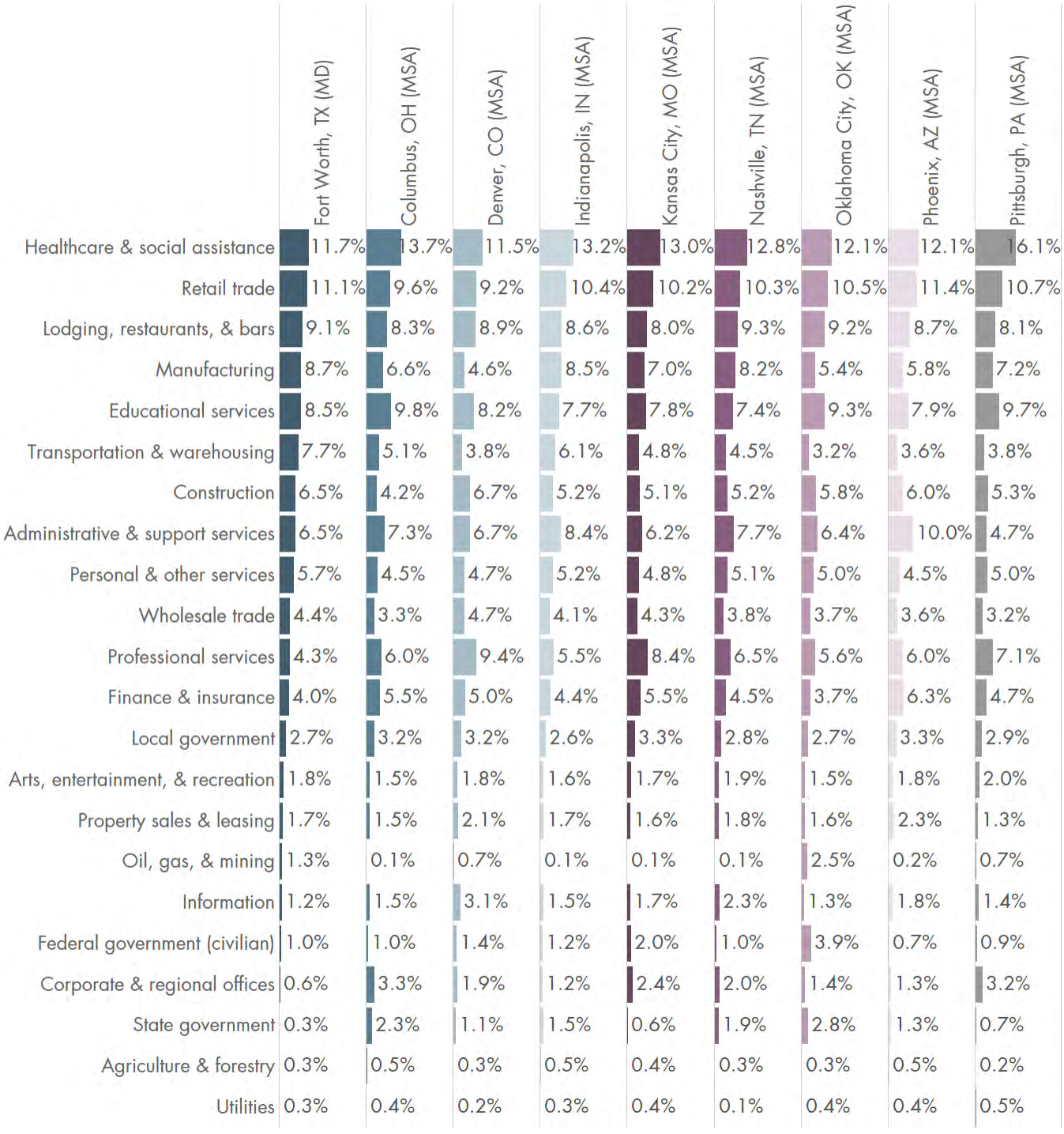
Figures 125-126 echo some of the points from previous charts, including Fort Worth's strengths in oil, gas, & mining and in transportation & warehousing. Fort Worth's location quotients in office-using sectors like professional services (0.67), information (0.62), and corporate & regional offices (0.44) fall well below the national index level of 1.00 and even further below some of its domestic benchmarks. Denver's LQs in those same sectors are 1.47, 1.65, and 1.38 respectively. Combined, these three office-using sectors account for 6.1 percent of Fort Worth MD employment and 14.4 percent of Denver MSA's (Figure 126).

FIGURE 125. 2016 COMPARATIVE LOCATION QUOTIENTS BY SECTOR

	Fort Worth, TX (MD)	Columbus, OH (MSA)	Denver, CO (MSA)	Indianapolis, IN (MSA)	Kansas City, MO (MSA)	Nashville, TN (MSA)	Oklahoma City, OK (MSA)	Phoenix, AZ (MSA)	Pittsburgh, PA (MSA)
Oil, gas, & mining	3.25	0.19	1.62	0.14	0.17	0.15	6.16	0.37	1.74
Transportation & warehousing	2.04	1.35	1.00	1.61	1.26	1.20	0.84	0.93	1.01
Construction	1.22	0.78	1.25	0.97	0.95	0.97	1.08	1.11	0.99
Wholesale trade	1.15	0.88	1.23	1.07	1.12	0.99	0.98	0.95	0.83
Personal & other services	1.14	0.91	0.94	1.03	0.96	1.03	1.00	0.90	1.00
Manufacturing	1.09	0.84	0.58	1.07	0.88	1.04	0.68	0.73	0.90
Lodging, restaurants, & bars	1.07	0.98	1.04	1.01	0.94	1.09	1.08	1.02	0.95
Retail trade	1.06	0.93	0.89	1.00	0.98	0.99	1.01	1.10	1.03
Arts, entertainment, & recreation	1.06	0.88	1.08	0.92	1.00	1.10	0.90	1.04	1.15
Administrative & support services	1.05	1.18	1.07	1.34	0.99	1.23	1.02	1.60	0.75
Finance & insurance	1.04	1.43	1.29	1.13	1.41	1.15	0.96	1.62	1.21
Property sales & leasing	1.01	0.89	1.29	1.01	0.95	1.12	0.97	1.43	0.82
Educational services	0.93	1.06	0.89	0.83	0.84	0.81	1.02	0.86	1.06
Healthcare & social assistance	0.89	1.04	0.88	1.00	0.98	0.97	0.92	0.92	1.22
Utilities	0.79	1.17	0.68	0.94	1.19	0.35	1.18	1.11	1.36
Local government	0.75	0.91	0.91	0.73	0.92	0.78	0.76	0.92	0.80
Federal government (civilian)	0.73	0.67	1.00	0.82	1.37	0.70	2.69	0.51	0.66
Professional services	0.67	0.95	1.47	0.87	1.31	1.02	0.87	0.93	1.12
Information	0.62	0.80	1.65	0.81	0.89	1.23	0.69	0.96	0.77
Corporate & regional offices	0.44	2.33	1.38	0.89	1.72	1.43	1.00	0.95	2.24
Agriculture & forestry	0.25	0.39	0.22	0.43	0.35	0.21	0.27	0.39	0.14
State government	0.24	1.60	0.78	1.03	0.41	1.28	1.96	0.89	0.49

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

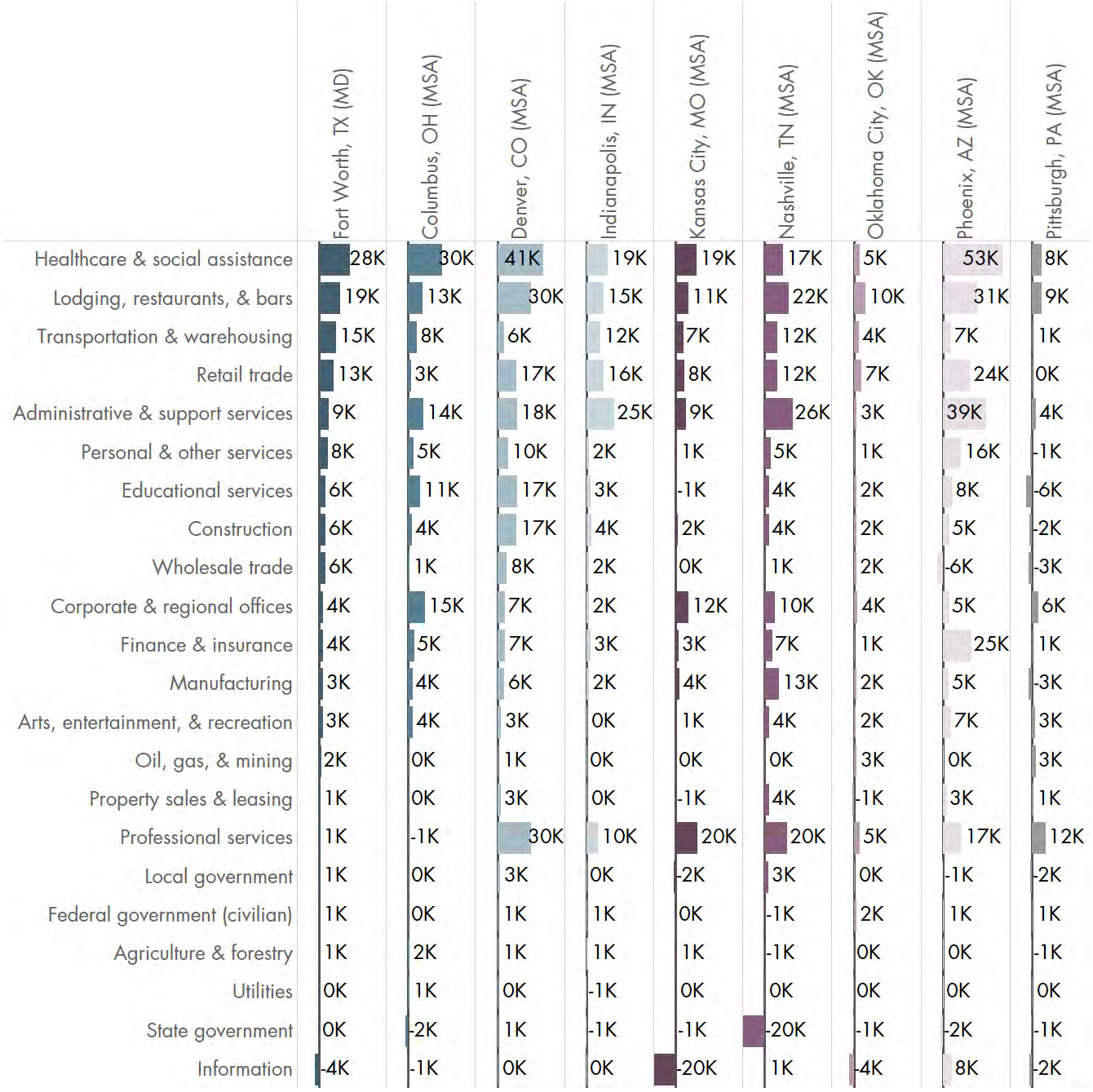
FIGURE 126. SECTOR SHARE (%) OF 2016 TOTAL EMPLOYMENT



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.
Note: Totals will not add to 100% due to rounding and to the exclusion of military employment from the table.

The structural differences highlighted between metropolitan Fort Worth and Denver were amplified during the 2010-2016 period as Fort Worth added 15,000 jobs in transportation & warehousing, compared to Denver's 6,000 (Figure 127). Yet during this same period, Denver added 30,000 new professional services jobs compared to the roughly 1,000-job net gain in this sector in Fort Worth. Figures 127-128 show the same data, with the first exhibit providing ready visual cues for the most significant net employment changes and the second exhibit providing more specifics.

FIGURE 127. NET CHANGE IN EMPLOYMENT BY SECTOR, 2010-2016
IN THE FORT WORTH MD & THE PEER MSAs



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 128. NET CHANGE IN EMPLOYMENT BY SECTOR, 2010-2016
IN THE FORT WORTH MD & THE PEER MSAs

	Fort Worth, TX (MD)	Columbus, OH (MSA)	Denver, CO (MSA)	Indianapolis, IN (MSA)	Kansas City, MO (MSA)	Nashville, TN (MSA)	Oklahoma City, OK (MSA)	Phoenix, AZ (MSA)	Pittsburgh, PA (MSA)
Healthcare & social assistance	27,644	30,410	41,161	18,921	19,213	16,997	5,301	53,422	8,305
Lodging, restaurants, & bars	18,839	13,344	30,303	15,094	11,444	21,676	10,273	30,922	8,560
Transportation & warehousing	15,113	8,188	6,035	12,214	6,930	11,909	4,371	7,480	637
Retail trade	13,225	3,054	16,800	15,572	7,999	11,870	6,947	24,174	-165
Administrative & support services	8,901	13,914	17,601	24,935	9,471	25,587	2,577	38,999	3,832
Personal & other services	7,569	4,851	9,625	2,308	1,455	5,356	1,400	15,799	-1,308
Educational services	6,055	11,176	17,470	3,425	-892	4,018	2,213	8,397	-5,560
Construction	5,803	3,813	17,138	4,179	1,850	3,934	2,443	5,383	-2,336
Wholesale trade	5,800	1,213	8,393	2,077	-482	746	2,298	-5,577	-3,344
Corporate & regional offices	3,550	15,124	6,793	2,342	11,546	9,684	3,631	5,343	5,961
Finance & insurance	3,528	5,393	7,212	3,417	3,011	6,917	938	25,323	842
Manufacturing	3,387	3,876	6,258	1,856	3,619	13,326	2,380	4,958	-3,462
Arts, entertainment, & recreation	3,266	4,460	3,295	286	1,176	4,349	1,957	7,451	2,699
Oil, gas, & mining	1,724	-87	1,071	-130	-49	164	2,852	148	3,283
Property sales & leasing	1,374	-64	3,160	415	-848	4,015	-1,350	3,171	1,006
Professional services	1,285	-524	30,092	10,114	19,844	20,124	5,227	16,814	11,971
Local government	1,057	-423	2,712	-8	-1,629	3,315	438	-706	-1,794
Federal government (civilian)	819	-27	1,180	766	-23	-933	2,374	511	542
Agriculture & forestry	691	1,617	911	1,048	990	-563	-295	19	-599
Utilities	223	981	2	-574	152	84	-294	-337	99
State government	-145	-2,482	1,411	-1,283	-547	-19,867	-639	-2,253	-854
Information	-4,071	-925	123	-235	-20,097	957	-3,878	7,598	-2,341

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

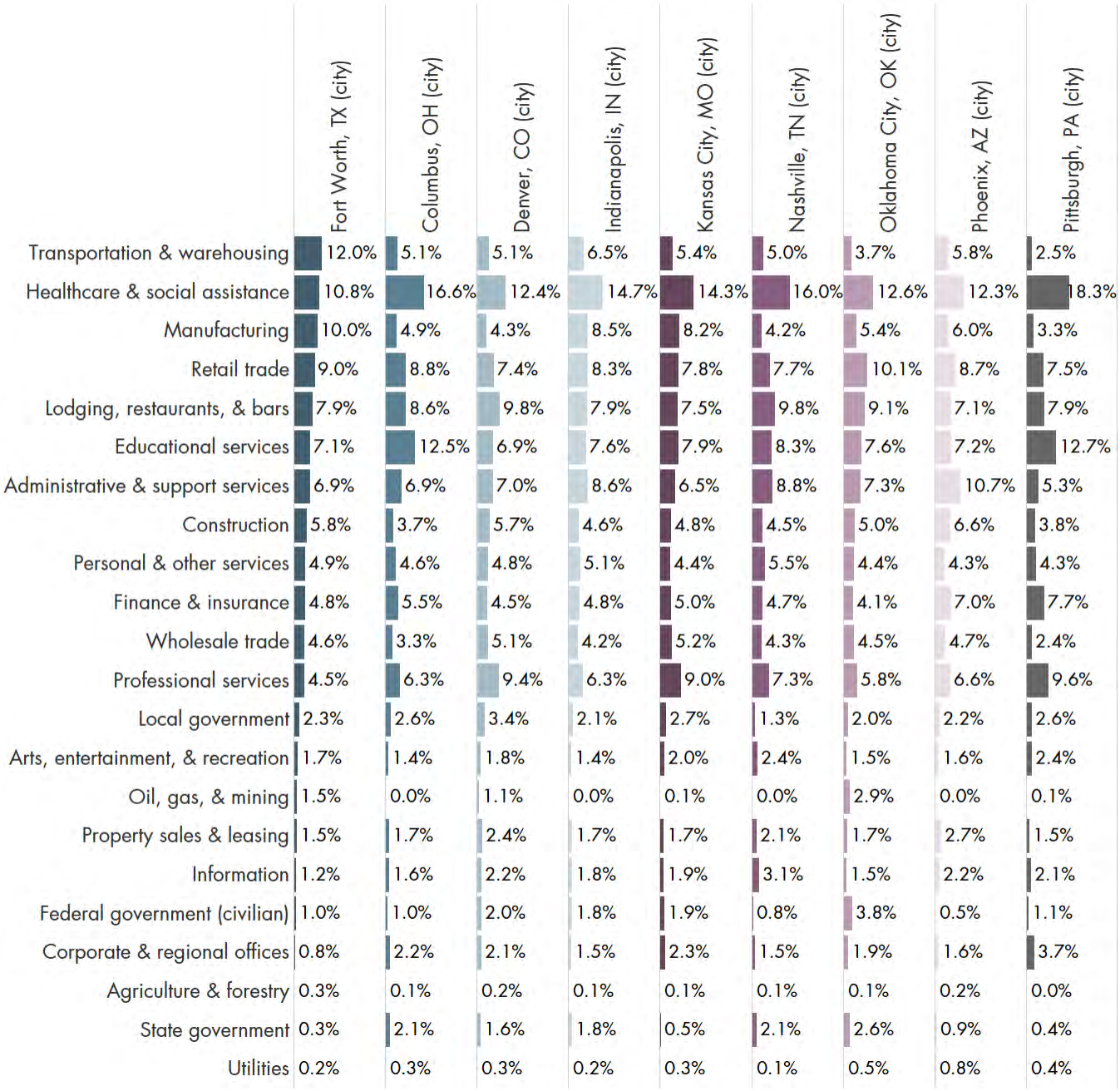
Whereas Figures 123-128 form a comparative overview of the metropolitan employment structures of Fort Worth and its domestic benchmarks, the following exhibits (Figures 129-132) dive into the municipal-level employment structures. As similarly noted on page 64, place-of-employment by sector is rarely seen at the municipal level. To recap, most city-level employment data released by statistical agencies are based on a household survey, i.e., where people *live*, not where they *work*. Familiar figures like labor force and unemployment rates derive from this household survey, but they steer away from employment sectors, which are more easily tied to workplace rather than residence. Surveys and administrative estimates at the establishment (workplace) level are typically not released at the city level. For the following analysis, TIP used an aggregation of ZIP-code level employment estimates produced by Emsi, a workforce data specialist. Our aggregation of ZIP codes approximates the municipal boundaries of the city of Fort Worth and its domestic benchmark's municipalities. Readers should keep in mind that these are estimates.

Figures 129-130 may look mundane, but there is actually something quite different going on here between Fort Worth and the rest of its domestic municipal benchmarks. Healthcare dominates the job base of all the domestic municipalities included in the benchmarking, but in Fort Worth, transportation & warehousing leads in employment. In no other domestic benchmark, does transportation & warehousing even rank second (or near the top) of employers. One reason contributing to this may be land. Many central cities are hemmed in by their suburbs (Dallas is one example of this) and have no capacity for annexation. Moreover, states approach annexation in different ways. In Fort Worth's case, the city encompasses a vast supply of land, much of it still undeveloped, which has made it possible to support low-density, land-using employment sectors (like transportation & warehousing) that might have gone to suburban or exurban fringes of the urbanized area in any other metropolitan area.

In other cities, the second spot after healthcare is often up for grabs. In Pittsburgh and Columbus, the educational services sector follows closely behind as the second largest employer. Think Carnegie Mellon (Pittsburgh) and Ohio State (Columbus), two of the nation's great universities, each of which plays a form-shaping role in the local economy of their respective cities as well as injecting each with a more youthful image. This is the new 21st century reality that belies Pittsburgh's 19th and 20th century manufacturing heritage. Today, only 3.3 percent of the city of Pittsburgh's employment is in manufacturing. In the city of Fort Worth, the manufacturing sector accounted for 1 in 10 jobs in 2016 and was the third largest source of employment.

Finally, consider Denver's modern economy. After healthcare, the next largest sectors are lodging, restaurants, & bars and professional services, both of which have clustered heavily in Denver's resurgent downtown and surrounding urban districts. These are typically low land-use, pedestrian-friendly employers that fit well with CBD and urban district strategies, as Denver demonstrates. These sectors also have the potential to generate property and sales taxes with relatively marginal land consumption.

FIGURE 129. SECTOR SHARE (%) OF 2016 TOTAL EMPLOYMENT
FOR THE CITY OF FORT WORTH & DOMESTIC MUNICIPAL BENCHMARKS



	Fort Worth, TX (city)	Columbus, OH (city)	Denver, CO (city)	Indianapolis, IN (city)	Kansas City, MO (city)	Nashville, TN (city)	Oklahoma City, OK (city)	Phoenix, AZ (city)	Pittsburgh, PA (city)
Transportation & warehousing	12.0%	5.1%	5.1%	6.5%	5.4%	5.0%	3.7%	5.8%	2.5%
Healthcare & social assistance	10.8%	16.6%	12.4%	14.7%	14.3%	16.0%	12.6%	12.3%	18.3%
Manufacturing	10.0%	4.9%	4.3%	8.5%	8.2%	4.2%	5.4%	6.0%	3.3%
Retail trade	9.0%	8.8%	7.4%	8.3%	7.8%	7.7%	10.1%	8.7%	7.5%
Lodging, restaurants, & bars	7.9%	8.6%	9.8%	7.9%	7.5%	9.8%	9.1%	7.1%	7.9%
Educational services	7.1%	12.5%	6.9%	7.6%	7.9%	8.3%	7.6%	7.2%	12.7%
Administrative & support services	6.9%	6.9%	7.0%	8.6%	6.5%	8.8%	7.3%	10.7%	5.3%
Construction	5.8%	3.7%	5.7%	4.6%	4.8%	4.5%	5.0%	6.6%	3.8%
Personal & other services	4.9%	4.6%	4.8%	5.1%	4.4%	5.5%	4.4%	4.3%	4.3%
Finance & insurance	4.8%	5.5%	4.5%	4.8%	5.0%	4.7%	4.1%	7.0%	7.7%
Wholesale trade	4.6%	3.3%	5.1%	4.2%	5.2%	4.3%	4.5%	4.7%	2.4%
Professional services	4.5%	6.3%	9.4%	6.3%	9.0%	7.3%	5.8%	6.6%	9.6%
Local government	2.3%	2.6%	3.4%	2.1%	2.7%	1.3%	2.0%	2.2%	2.6%
Arts, entertainment, & recreation	1.7%	1.4%	1.8%	1.4%	2.0%	2.4%	1.5%	1.6%	2.4%
Oil, gas, & mining	1.5%	0.0%	1.1%	0.0%	0.1%	0.0%	2.9%	0.0%	0.1%
Property sales & leasing	1.5%	1.7%	2.4%	1.7%	1.7%	2.1%	1.7%	2.7%	1.5%
Information	1.2%	1.6%	2.2%	1.8%	1.9%	3.1%	1.5%	2.2%	2.1%
Federal government (civilian)	1.0%	1.0%	2.0%	1.8%	1.9%	0.8%	3.8%	0.5%	1.1%
Corporate & regional offices	0.8%	2.2%	2.1%	1.5%	2.3%	1.5%	1.9%	1.6%	3.7%
Agriculture & forestry	0.3%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.0%
State government	0.3%	2.1%	1.6%	1.8%	0.5%	2.1%	2.6%	0.9%	0.4%
Utilities	0.2%	0.3%	0.3%	0.2%	0.3%	0.1%	0.5%	0.8%	0.4%

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

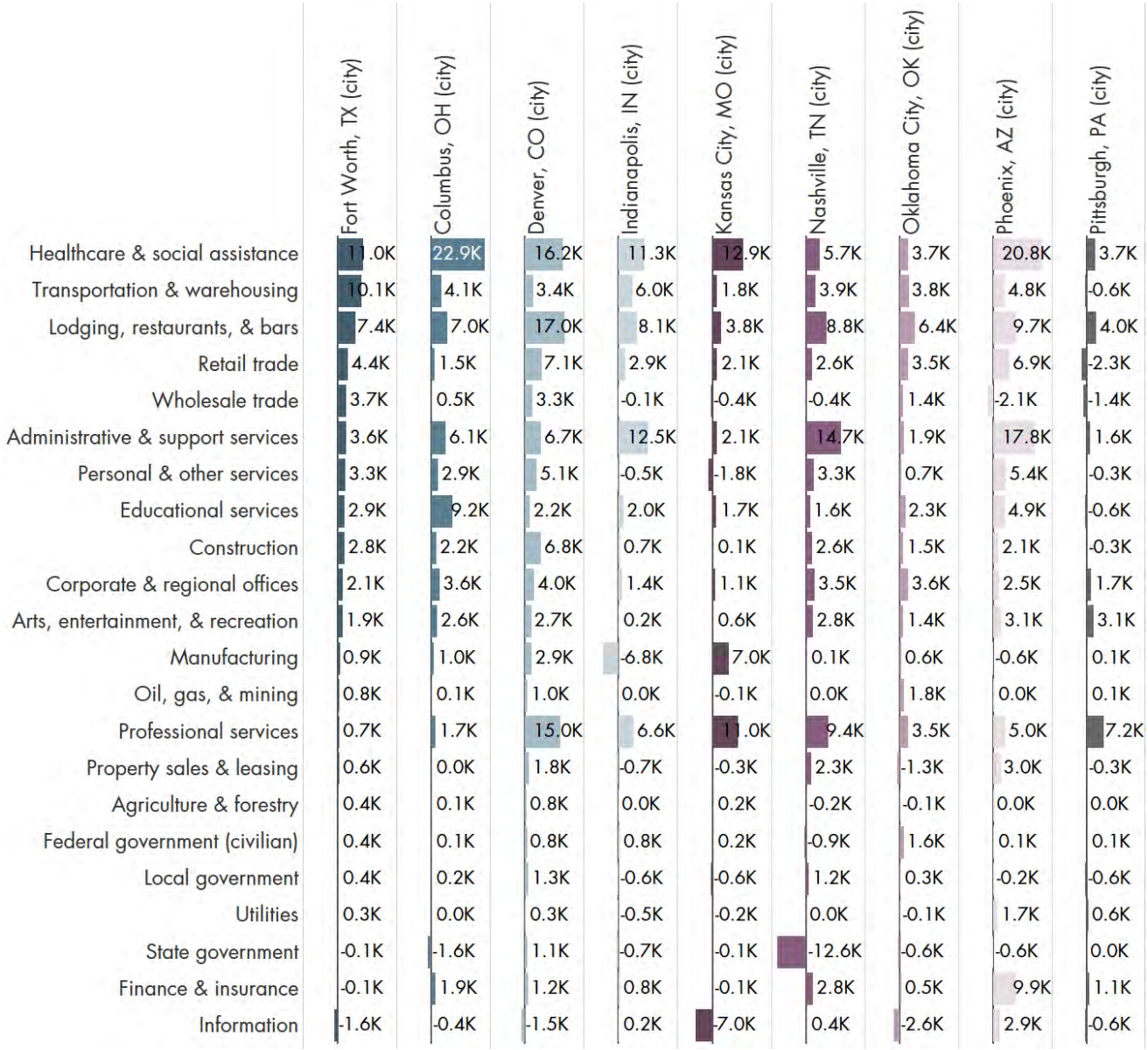
FIGURE 130. 2016 TOTAL EMPLOYMENT BY SECTOR
FOR THE CITY OF FORT WORTH & DOMESTIC MUNICIPAL BENCHMARKS

	Fort Worth, TX (city)	Columbus, OH (city)	Denver, CO (city)	Indianapolis, IN (city)	Kansas City, MO (city)	Nashville, TN (city)	Oklahoma City, OK (city)	Phoenix, AZ (city)	Pittsburgh, PA (city)
Transportation & warehousing	58.0K	29.5K	35.6K	41.8K	26.0K	21.7K	16.1K	48.2K	12.6K
Healthcare & social assistance	52.2K	95.4K	86.7K	94.7K	68.9K	69.2K	55.1K	102.0K	92.3K
Manufacturing	48.4K	28.0K	29.7K	54.6K	39.6K	18.0K	23.8K	49.5K	16.6K
Retail trade	43.6K	50.5K	51.8K	53.4K	37.8K	33.3K	44.4K	72.7K	37.9K
Lodging, restaurants, & bars	38.2K	49.4K	68.3K	50.9K	36.4K	42.6K	40.1K	59.4K	39.9K
Educational services	34.3K	71.7K	48.2K	49.0K	38.2K	35.8K	33.4K	59.6K	63.9K
Administrative & support services	33.3K	40.0K	49.0K	55.1K	31.3K	38.3K	32.3K	89.1K	26.8K
Construction	27.8K	21.1K	39.5K	29.8K	23.0K	19.6K	21.8K	55.1K	19.1K
Personal & other services	23.9K	26.8K	33.7K	32.9K	21.3K	23.9K	19.3K	36.1K	21.8K
Finance & insurance	23.2K	31.7K	31.1K	31.0K	23.9K	20.4K	18.2K	58.3K	39.0K
Wholesale trade	22.4K	19.0K	35.4K	27.2K	24.9K	18.5K	19.9K	39.0K	12.0K
Professional services	21.9K	36.6K	66.0K	40.8K	43.5K	31.6K	25.4K	54.8K	48.4K
Local government	11.2K	14.7K	23.6K	13.4K	13.2K	5.8K	8.8K	18.5K	12.9K
Arts, entertainment, & recreation	8.3K	7.9K	12.9K	9.3K	9.7K	10.5K	6.7K	13.4K	11.8K
Oil, gas, & mining	7.2K	0.3K	7.6K	0.2K	0.3K	0.2K	12.7K	0.2K	0.5K
Property sales & leasing	7.2K	9.8K	16.9K	11.1K	8.1K	9.0K	7.4K	22.3K	7.3K
Information	5.8K	9.3K	15.1K	11.4K	9.0K	13.5K	6.5K	18.5K	10.4K
Federal government (civilian)	4.9K	5.9K	14.2K	11.9K	9.3K	3.4K	16.6K	4.1K	5.4K
Corporate & regional offices	3.9K	12.7K	14.8K	9.4K	10.9K	6.6K	8.5K	13.2K	18.6K
Agriculture & forestry	1.7K	0.4K	1.5K	0.9K	0.7K	0.5K	0.3K	1.8K	0.1K
State government	1.5K	11.9K	11.2K	11.5K	2.6K	9.0K	11.6K	7.3K	2.2K
Utilities	1.1K	1.8K	2.4K	1.3K	1.3K	0.2K	2.2K	6.8K	2.2K

Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

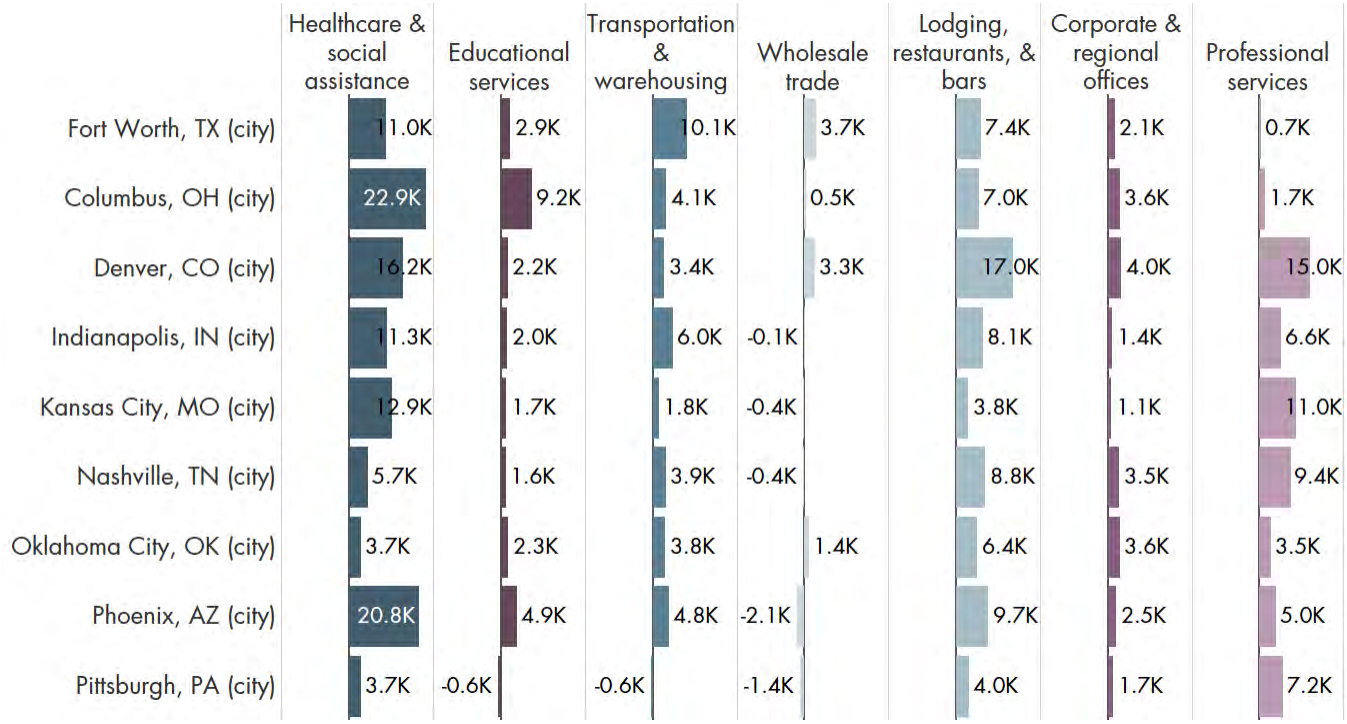
The municipal employment patterns observed in Figures 129-130 were further reinforced during the post-recession recovery. As Figures 131-132 show, all cities in this benchmark assessment experienced substantial gains in healthcare employment during the 2010-2016 period. While Fort Worth boosted its transportation & warehousing sector with more than 10,000 new jobs during this period, Columbus was adding to its base in educational services and Denver was expanding its employment in lodging, restaurants, & bars as well as professional services. During this period, Denver added about 19,000 office-using jobs in the combined sectors of professional services and corporate & regional offices. Using the rule-of-thumb of 200 square feet per office worker, these job gains translate to about 3.8 million square feet of implied office absorption within the city of Denver between 2010 and 2016 in those two sectors alone. To put this into local perspective, 3.8 million square feet of leasable office space is about the same as nine buildings the size of the Pier 1 Imports Building in Fort Worth.

FIGURE 131. NET EMPLOYMENT CHANGE BY SECTOR, 2010-2016
FOR THE CITY OF FORT WORTH & DOMESTIC MUNICIPAL BENCHMARKS



Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

FIGURE 132. COMPARATIVE NET EMPLOYMENT CHANGE, 2010-2016
FOR SELECTED SECTORS IN THE CITY OF FORT WORTH & DOMESTIC MUNICIPAL BENCHMARKS

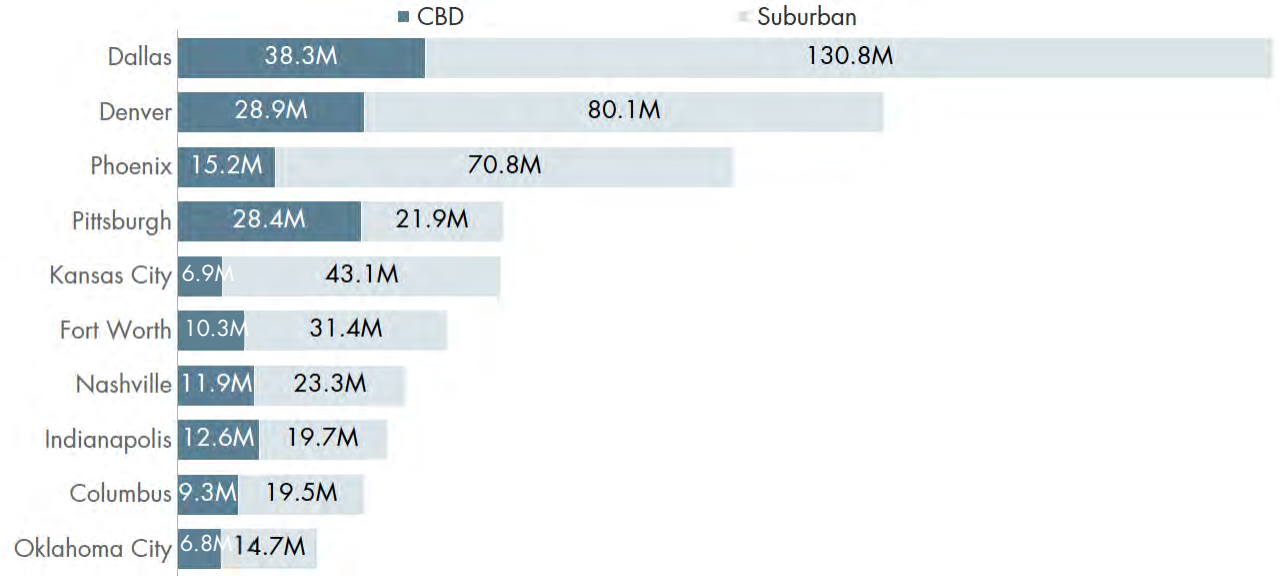


Sources: US Bureau of Labor Statistics, Emsi, TIP Strategies.

DOMESTIC BENCHMARKS: CBD & SUBURBAN OFFICE MARKETS

Figures 133-140 compare the Fort Worth MD's office market to its eight domestic MSA benchmarks. The Dallas metropolitan division is also included in this analysis for better local perspective. As Figure 133 shows, the composition of total office space in the metro area is heavily weighted toward the east. As of Q1 2017, the combined CBD and suburban office inventory for the Dallas MD totaled 169 million square feet compared to just under 42 million square feet in the Fort Worth MD. Among the MSA benchmarks, Fort Worth's total office market (CBD plus suburbs) is smaller than those of Denver, Phoenix, Pittsburgh, and Kansas City but larger than those of Nashville, Indianapolis, Columbus, and Oklahoma City. Fort Worth's CBD office inventory of 10.3 million square feet (MSF) was smaller than all the domestic benchmarks except for three: Columbus, Kansas City, and Oklahoma City. The opposite was true for the suburban office inventory. By this measure, Fort Worth's suburban inventory (31.4 MSF) surpassed five of the domestic benchmarks: Pittsburgh, Nashville, Indianapolis, Columbus, and Oklahoma City.

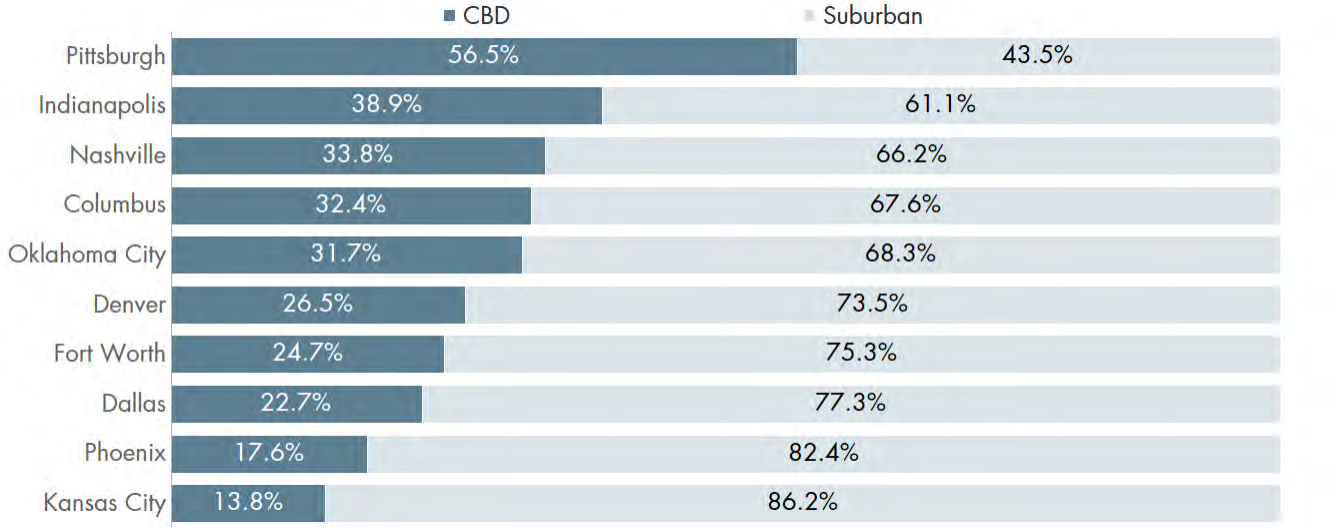
FIGURE 133. OFFICE INVENTORY (IN SQUARE FEET) BY METROPOLITAN AREA, Q1 2017



Sources: JLL, Cushman & Wakefield.
Notes: All geographies listed are MSAs except for Dallas (MD) and Fort Worth (MD). Dallas CBD includes Uptown. All periods shown are Q1 2017 except Oklahoma City (Q4 2016).

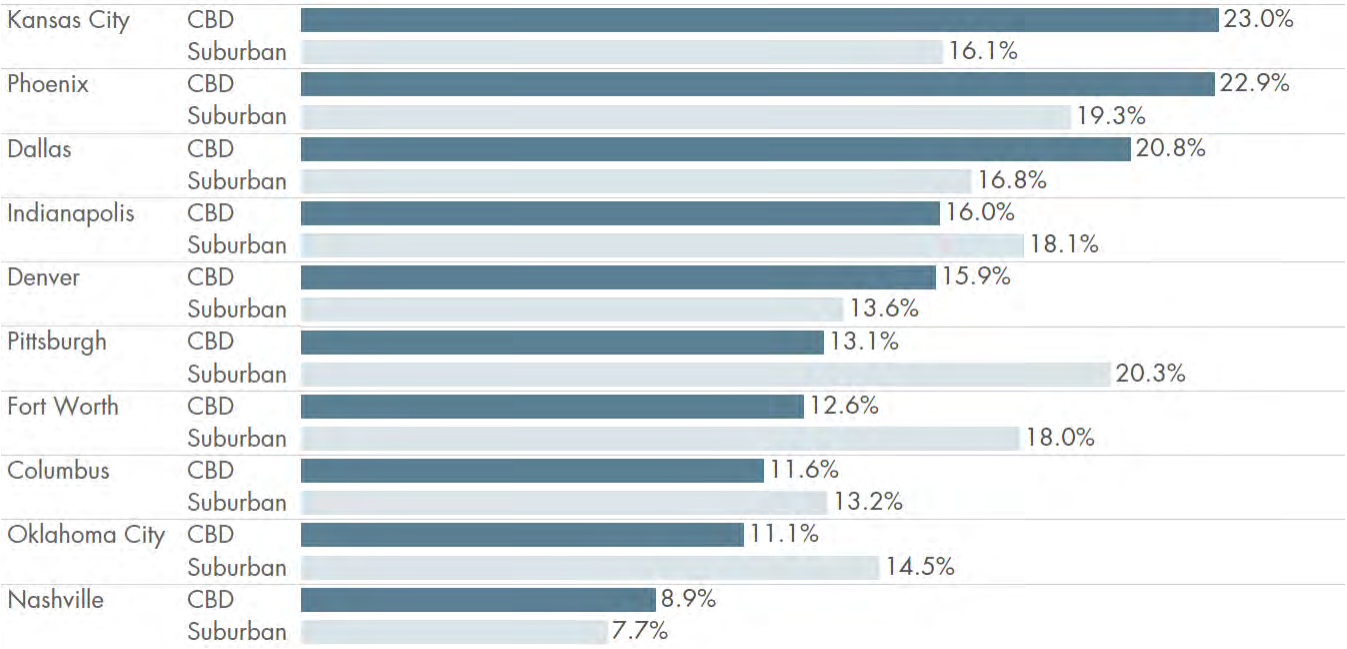
The balance of office inventory between the CBD and suburban areas can be a latent indicator of a CBD's age and historical stock of buildings. Among the domestic benchmarks, Pittsburgh was the only one with more than 50 percent of its office stock in the downtown area as of Q1 2017, while fast-growing Sun Belt cities like Dallas, Fort Worth, and Phoenix had less than one-quarter of their office space in their respective CBDs. This trend, however, is not a foregone conclusion. Denver and Oklahoma City embody the profiles of Sun Belt cities, yet both have a greater share of their office stocks in the CBD than do either Dallas or Fort Worth.

FIGURE 134. COMPOSITION OF OFFICE INVENTORY (% OF TOTAL) BY METROPOLITAN AREA, Q1 2017



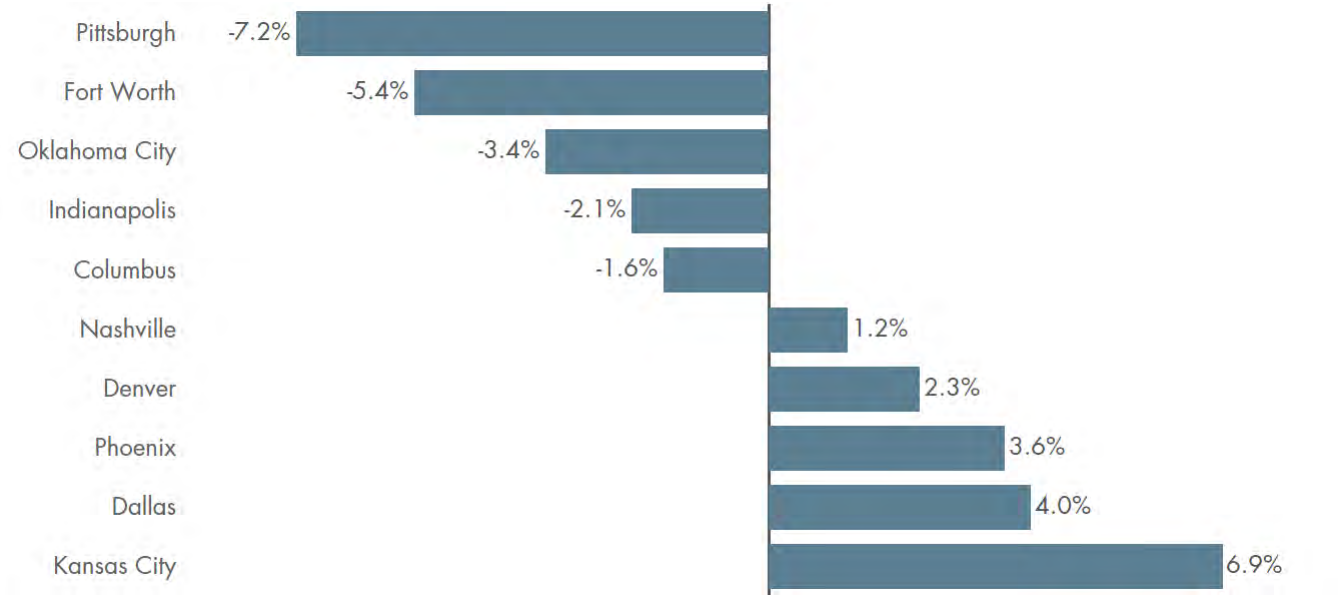
The marginal role of CBD office space in the Phoenix, Kansas City, and Dallas metropolitan markets (Figure 134) was compounded further by high vacancy rates as of Q1 2017. CBD vacancy rates in all three markets exceeded 20 percent (Figure 135) during the measured period. Fort Worth's occupancy statistics differed, however, with the low CBD vacancy rate of just 12.6 percent running well below the 18.0 percent of the surrounding suburbs. CBD vacancy rates were also tighter than the suburbs in Oklahoma City, Columbus, Pittsburgh, and Indianapolis. The differential between the CBD and suburban vacancy rate in Fort Worth (5.4 percentage points) was wider than in any other domestic peer market except for Pittsburgh (Figure 136), and this differential stood in sharp contrast to Dallas, where the CBD vacancy rate exceeded the suburbs by 4.0 percentage points.

FIGURE 135. OFFICE VACANCY RATE (%) BY METROPOLITAN AREA, Q1 2017



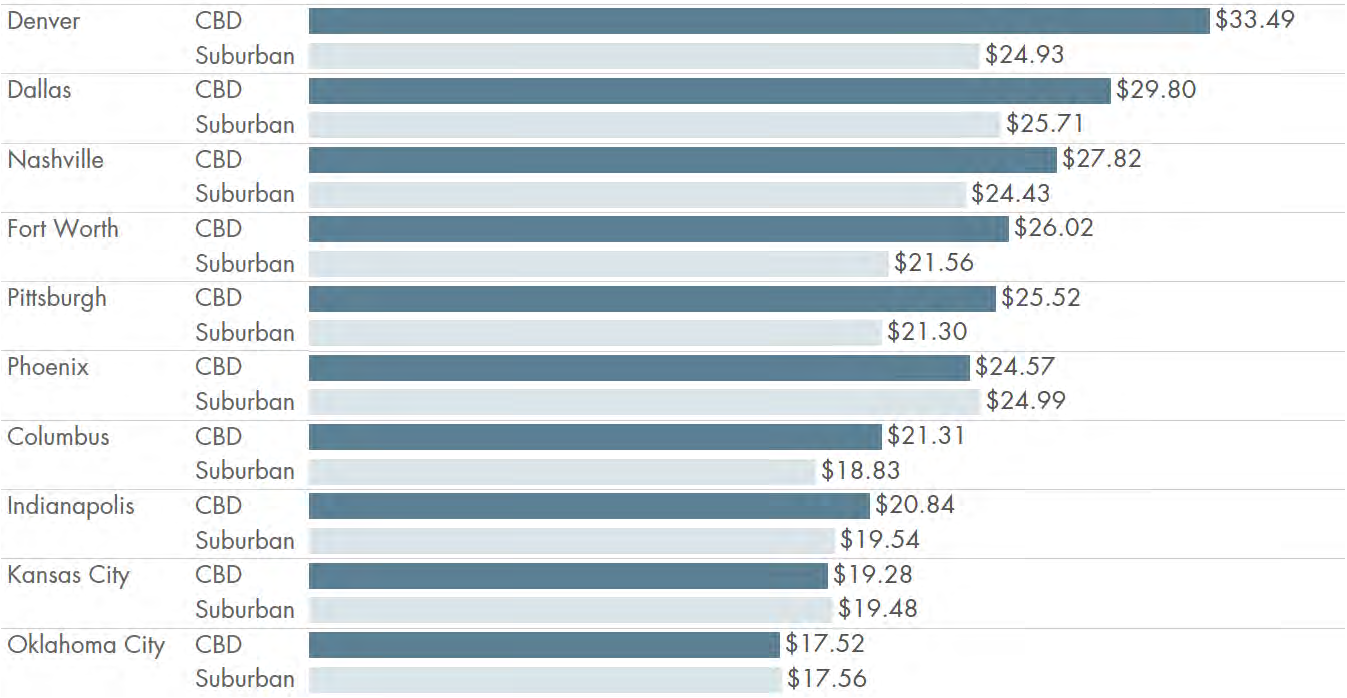
Sources (both figures this page): JLL, Cushman & Wakefield.
Notes: All geographies listed are MSAs except for Dallas (MD) and Fort Worth (MD). Dallas CBD includes Uptown. All periods shown are Q1 2017 except Oklahoma City, in which Q4 2016 is shown.

FIGURE 136. OFFICE VACANCY RATE DIFFERENTIAL (%), CBD VS. SUBURBAN, Q1 2017



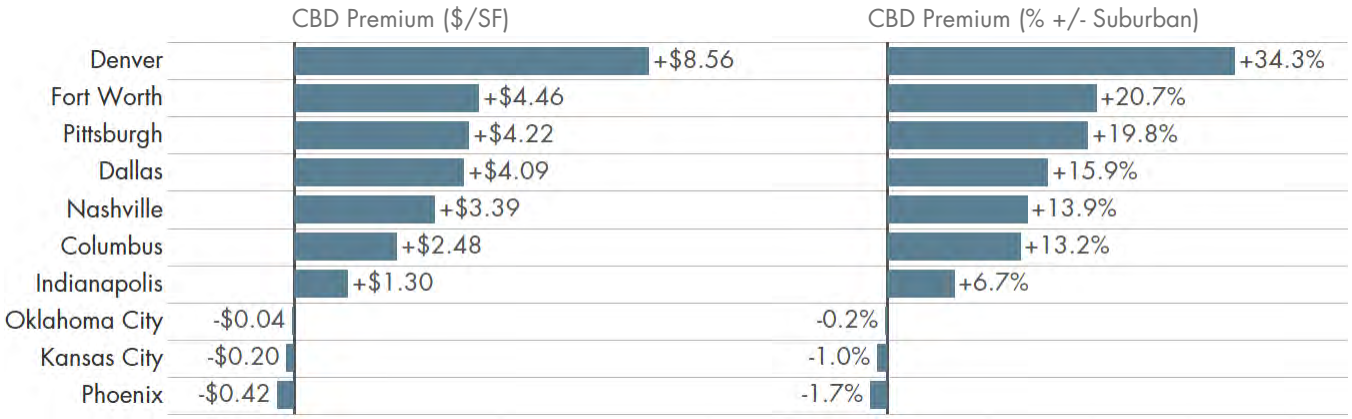
Fort Worth's relatively low CBD vacancy rate is even more remarkable when rents are factored in (Figure 137-Figure 138). Downtown Fort Worth commands a 20.7 percent ($4.46/SF) premium over average asking rents for office space in the surrounding suburbs. This is a higher differential of CBD over suburban offices than any of the peer markets except Denver.

FIGURE 137. AVERAGE ASKING RENT ($/SF) BY METROPOLITAN AREA, Q1 2017



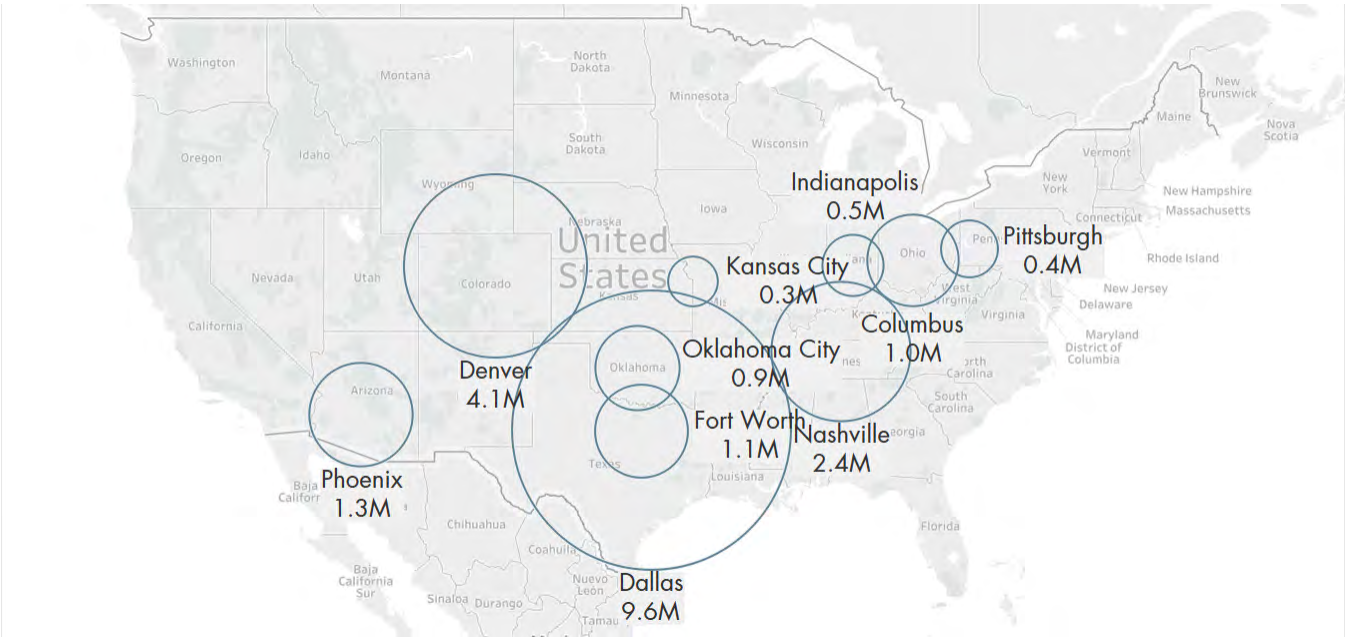
Sources (both figures this page): JLL, Cushman & Wakefield.
Notes: All geographies listed are MSAs except for Dallas (MD) and Fort Worth (MD). Dallas CBD includes Uptown. All periods shown are Q1 2017 except Oklahoma City, in which Q4 2016 is shown.

FIGURE 138. OFFICE RENT PREMIUM ($/SF), CBD VS. SUBURBAN, Q1 2017



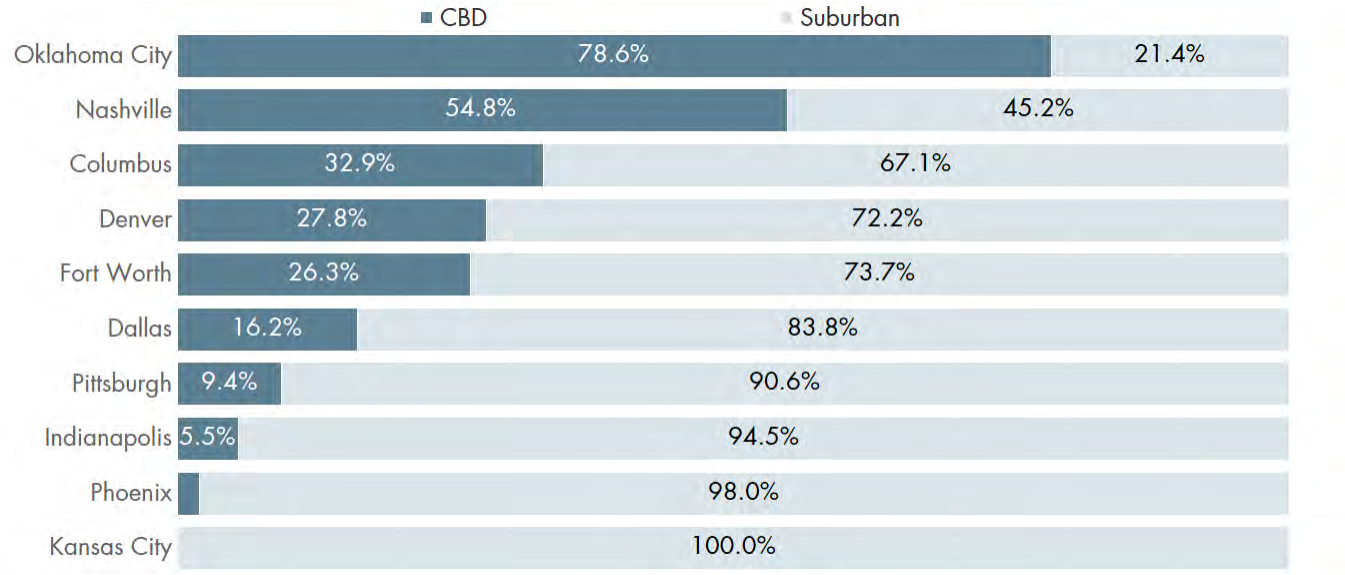
If vacancy rates and rents offer clues to near-term local and regional office demand, then the amount of office construction underway can foreshadow changes to supply and availability (Figure 139). In the Dallas-Fort Worth metro area, one might assume that the low vacancy rate in the Fort Worth CBD would spur more construction, especially since the limited availability of space in the CBD supports a high rent differential over the suburbs. What is happening on the ground may offer some surprises. As of Q1 2017, the Dallas-Fort Worth metro area had 10.7 MSF of construction underway, according to JLL, but the composition was lopsided with 9.6 MSF in the Dallas MD and just 1.1 MSF in the Fort Worth MD. And of the small pipeline of construction underway in Fort Worth, nearly three-quarters of the balance (73.7 percent) was underway outside of the CBD (Figure 140). The numbers in this section derive entirely from JLL's analysis of the Q1 2017 office market, but these statistics differ only slightly from CoStar's office analysis of the same period presented earlier in Figure 87. In both cases, the lopsided composition of office construction between Dallas and Fort Worth was unmistakable.

FIGURE 139. OFFICE SPACE UNDER CONSTRUCTION (IN SQUARE FEET) BY METRO AREA, Q1 2017



Sources (both figures this page): JLL, Cushman & Wakefield.
Notes: All geographies listed are MSAs except for Dallas (MD) and Fort Worth (MD). Dallas CBD includes Uptown. All periods shown are Q1 2017 except Oklahoma City, in which Q4 2016 is shown.

FIGURE 140. COMPOSITION OF OFFICE SPACE UNDER CONSTRUCTION (% OF TOTAL) BY METROPOLITAN AREA, Q1 2017



Sources: JLL, Cushman & Wakefield.
Notes: All geographies listed are MSAs except for Dallas (MD) and Fort Worth (MD). Dallas CBD includes Uptown. All periods shown are Q1 2017 except Oklahoma City, in which Q4 2016 is shown.

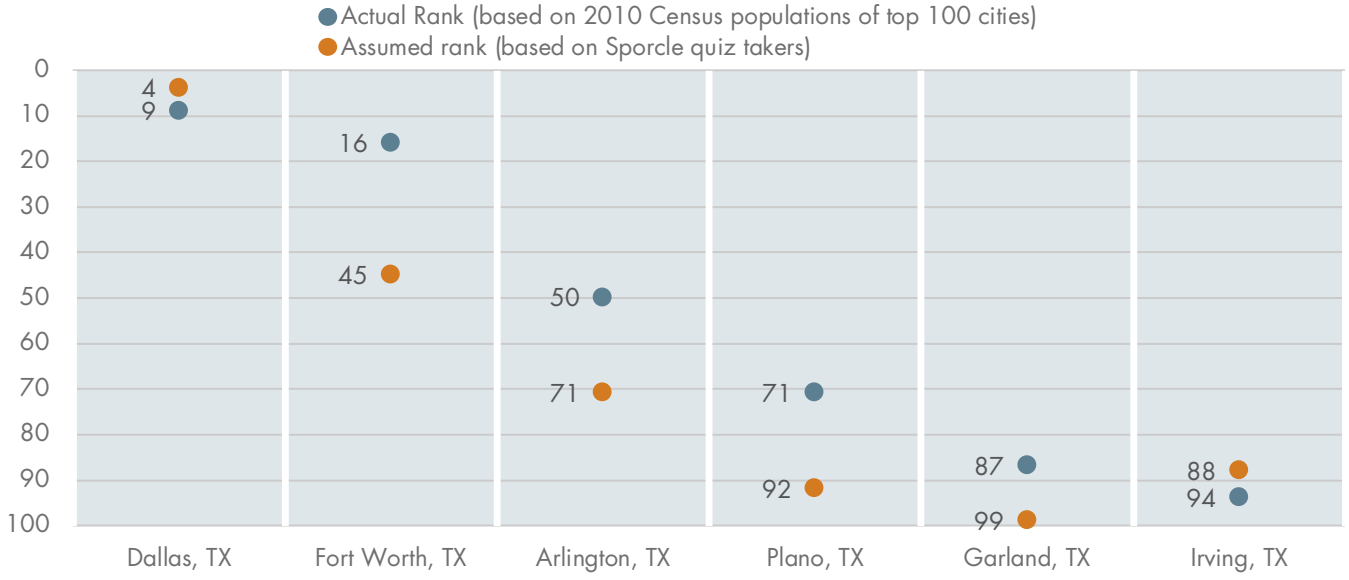
DFW & DOMESTIC BENCHMARKS: EXTERNAL VISIBILITY

Brand and image can be subjective topics to quantify. How can a concept as vague as a city's "brand" be truly measured? It is neither a matter of simple accounting as it would be with measuring population or employment, nor is there a clear sale of tangible goods from which revenues can be measured with certainty. A degree of creativity must then be employed to identify suitable metrics to capture a city's discernible image, its brand, or its quotient of "recognizability." Occasionally, unexpected and original sources can emerge with just the right metrics to capture the unseen and the previously unmeasured. Figures 141-146 present two unique ways to quantify where Fort Worth appears on the public's proverbial "radar."

In 2009, a website called Sporcle, which specializes in games of trivia, challenged its users to list the 100 most populous cities in the United States. Within the Dallas-Fort Worth metro area, six cities that rank in their top 100. Besides Dallas and Fort Worth, the largest suburbs include Arlington, Plano, Garland, and Irving. Figure 141 shows how these six cities rank in terms of their actual populations versus what their implied rank was among the quiz takers. To be sure, those participating were a self-selected group of quiz takers, and the results were never intended to be a scientific sample of the population. The quiz nevertheless ran for years and received more than 500,000 completed responses. The figure below shows the results between 2009 and 2016. Even though Fort Worth is among the nation's 20 largest municipalities, quiz takers during this period gave it an implied rank of 45th in population. From this, one can draw some basic (though unscientific) conclusions about a public that perceives Fort Worth to be among a secondary pantheon of American cities.

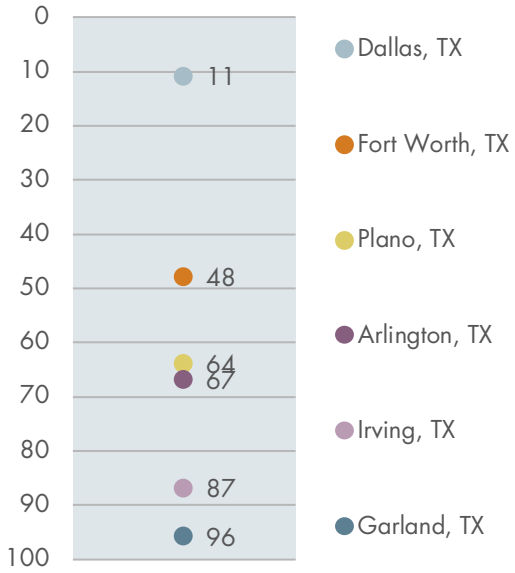
The results from the Sporcle quiz are echoed by the volume of Google searches conducted between 2004 and 2016. As Figure 142 shows, Fort Worth ranked 48th out of the 100 most populous US cities by this measure. Figure 143 shows these same search results presented in an indexed format with New York City equal to 100.0. In this context, Fort Worth's indexed Google search score was 6.6.

FIGURE 141. DFW CITIES AMONG THE TOP 100 IN THE US: ACTUAL AND ASSUMED RANKS



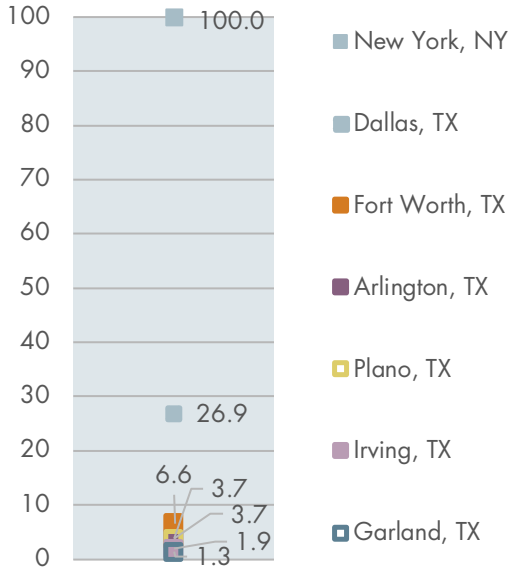
Source: Sporcle, via fivethirtyeight.com.
Note: Based on a self-selected online quiz, with results measured between September 26, 2009 and February 22, 2016.

FIGURE 142. GOOGLE SEARCH RANK: DFW PEER CITIES AMONG THE US 100 LARGEST CITIES



Source: Google, via fivethirtyeight.com.
Note: Based on Google search data between January 1, 2004 and February 18, 2016.

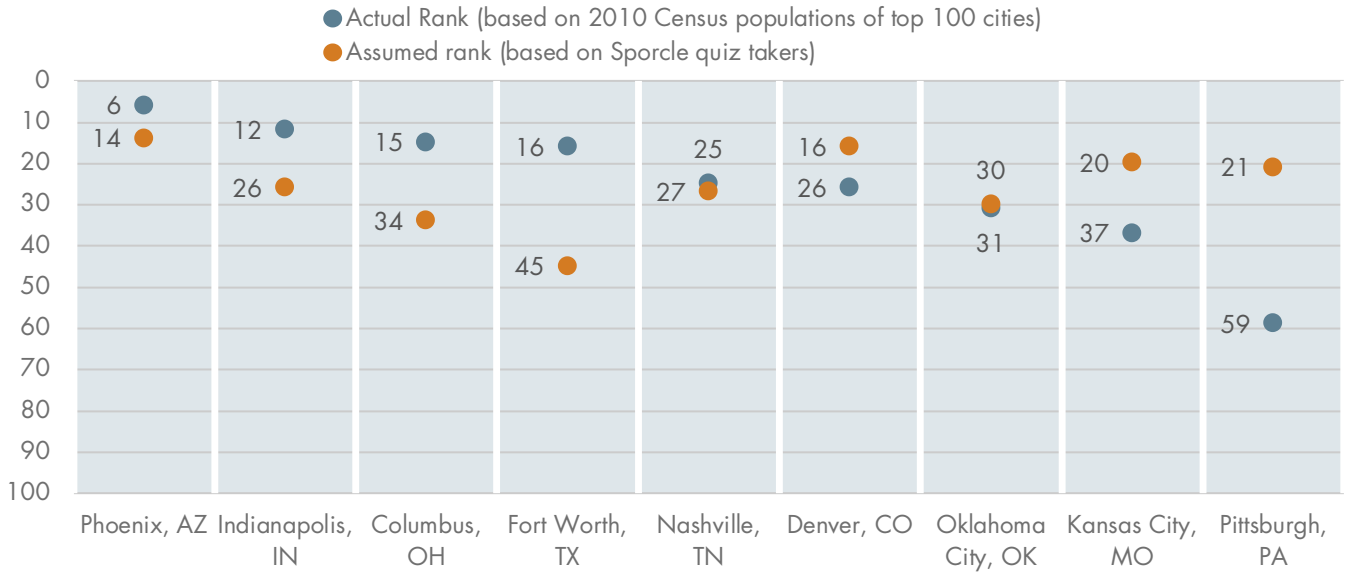
FIGURE 143. INDEXED GOOGLE SEARCH: DFW PEER CITIES WITH NEW YORK=100



Source: Google, via fivethirtyeight.com.
Note: Based on Google search data between January 1, 2004 and February 18, 2016.

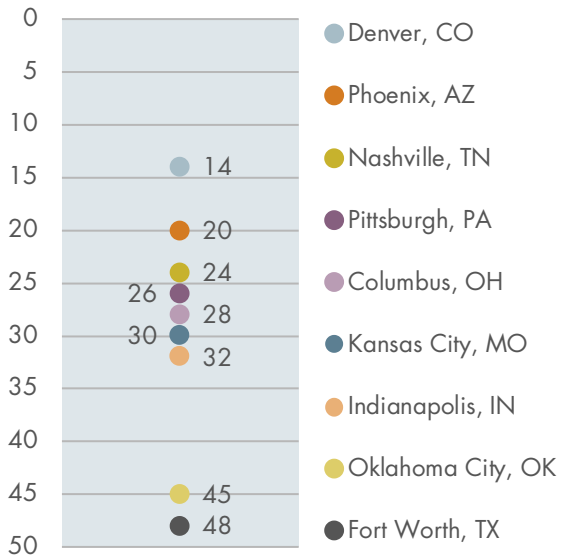
Figures 144-146 present the same Fort Worth data from Sporcle and Google, but in these charts, the city is compared against the set of eight domestic benchmarks referenced throughout this report. In the Sporcle quiz, Fort Worth's implied population rank of 45th was the lowest of any of the benchmarks, even though Fort Worth is more populous than five of the eight: Nashville, Denver, Oklahoma City, Kansas City, and Pittsburgh. Fort Worth's search rank of 48th among the top US cities was similarly the lowest of all the benchmarks.

FIGURE 144. FORT WORTH & DOMESTIC PEER CITIES: ACTUAL AND ASSUMED POPULATION RANKS



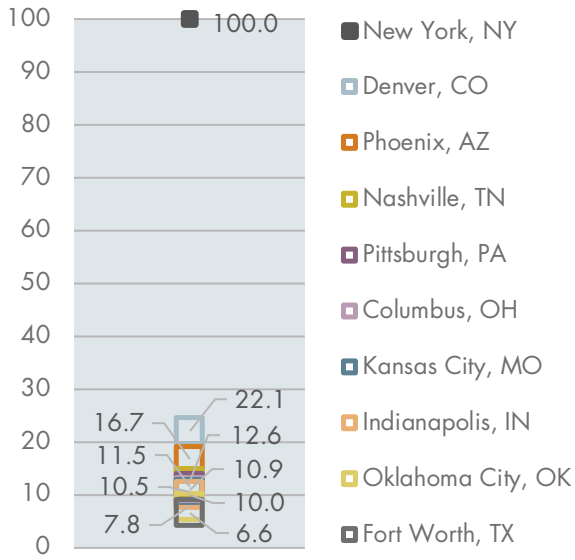
Source: Sporcle, via fivethirtyeight.com.
Note: Based on a self-selected online quiz, with results measured between September 26, 2009 and February 22, 2016.

FIGURE 145. GOOGLE SEARCH RANK: FORT WORTH & DOMESTIC BENCHMARK CITIES



Source: Google, via fivethirtyeight.com.
Note: Based on Google search data between January 1, 2004 and February 18, 2016.

FIGURE 146. INDEXED GOOGLE SEARCH: DOMESTIC BENCHMARK WITH NEW YORK=100



Source: Google, via fivethirtyeight.com.
Note: Based on Google search data between January 1, 2004 and February 18, 2016.

11. STAKEHOLDER SURVEY

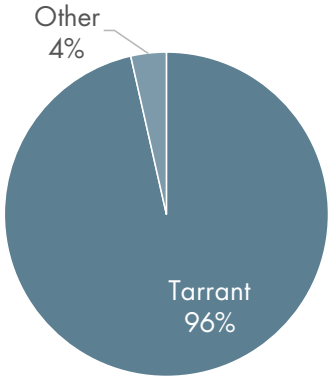
To better understand Fort Worth's opportunities and challenges, an online survey was conducted as part of the strategic planning process. The survey was designed to solicit views of both residents and employers. This section focuses on aspects related to living in Fort Worth. Questions relating to hiring, training, and retraining workers will be presented as part of Volume 2 of the study, which will look at the metro area's occupational structure and the alignment of the workforce with Fort Worth's target industries.

The survey was posted on the website created for the planning process (http://fortworthtexas.gov/edplan/) and was available over a roughly 5-week period (April 29, 2017 through May 27, 2017). It was promoted by the City of Fort Worth Communications & Public Engagement Office and was highlighted in a *Fort Worth Star-Telegram* article about the planning process ("Fort Worth plan to dig deep on how to make the city more competitive," May 19, 2017). A total of 1,273 responses were received.

As might be expected, given the focus of the survey, the majority of survey respondents (85 percent) were Fort Worth residents. Responses received from residents of other cities were almost exclusively from Tarrant County communities; just 4 percent of responses came from counties other than Tarrant. Respondents were also likely to have lived in the community for an extended period, with more than two out of five (44 percent) having resided in Fort Worth for 20 years or more.

FIGURE 147. RESPONDENT PROFILE: PLACE OF RESIDENCE

COUNTY



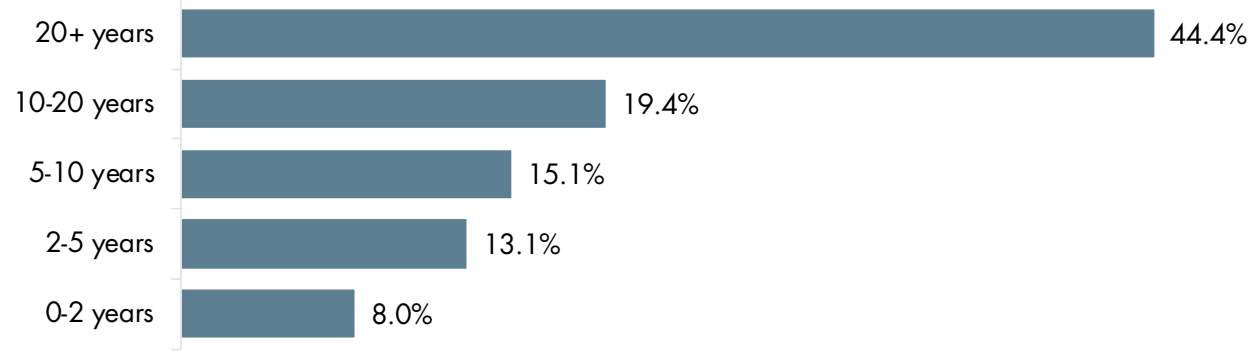
TOP 10 CITIES

	# OF RESPONDENTS	% OF TOTAL
Fort Worth	1,087	85%
Benbrook	23	2%
North Richland Hills	15	1%
Arlington	10	1%
Burleson	10	1%
Haslet	8	1%
Keller	8	1%
Bedford	6	<1%
Haltom City	6	<1%
Southlake	6	<1%

TOP 10 ZIP CODES

	# OF RESPONDENTS	% OF TOTAL
76107	131	10%
76109	97	8%
76116	82	6%
76110	76	6%
76133	72	6%
76102	71	6%
76244	55	4%
76132	52	4%
76112	45	4%
76104	40	3%

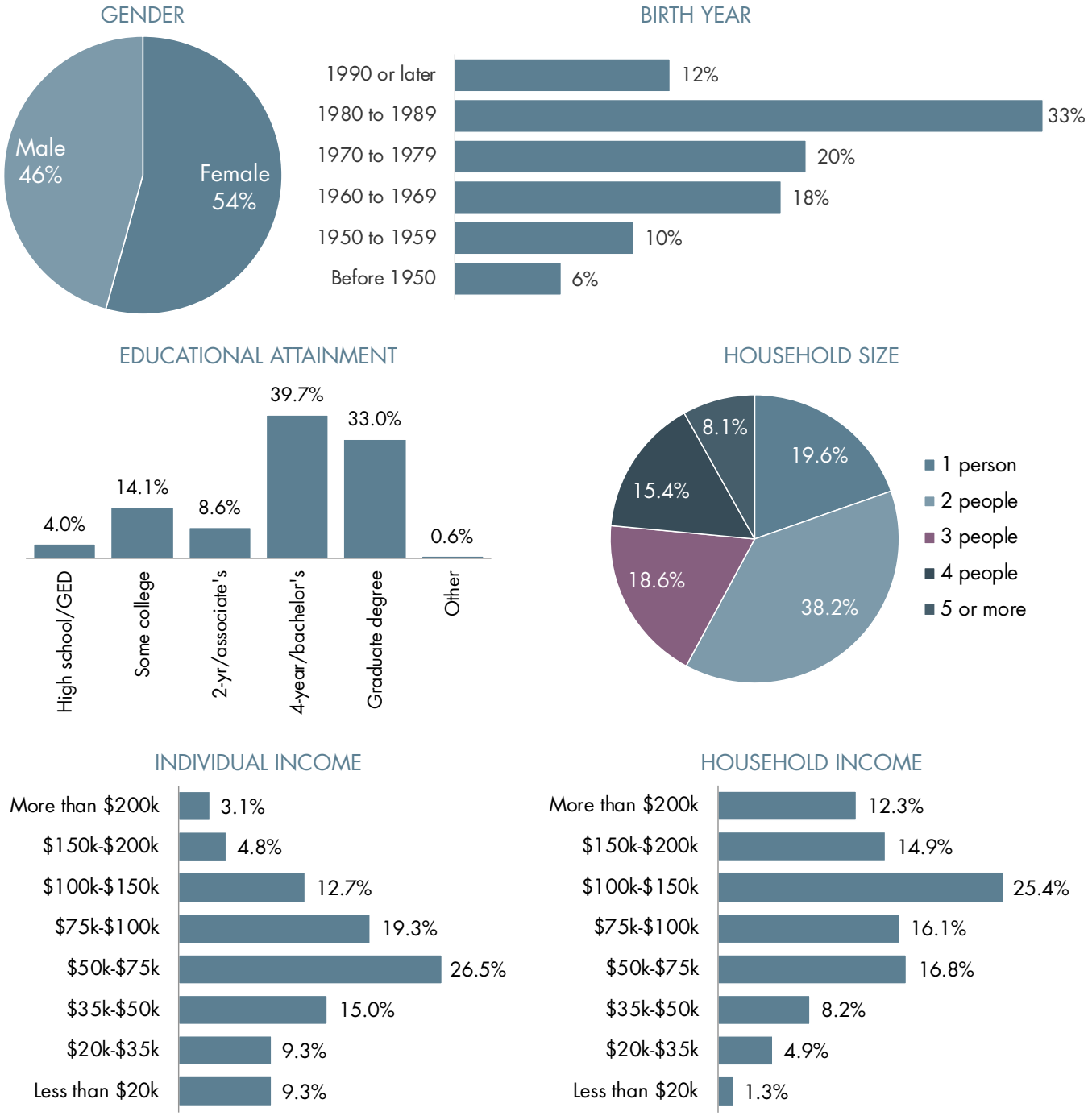
NUMBER OF YEARS RESIDING IN FORT WORTH AREA



Source: Online survey of area residents conducted by TIP Strategies, April-May 2017.

A large share of survey respondents was below the age of 40, with 45 percent having been born since 1980. Respondents also had high levels of education; 95 percent indicated at least some college experience. Nearly three-quarters (72 percent) of those who provided their attainment levels had a four-year degree or higher. Respondents also reported relatively high income levels, with more than one-quarter (27 percent) having household incomes above $150,000.

FIGURE 148. RESPONDENT PROFILE: DEMOGRAPHICS & INCOME

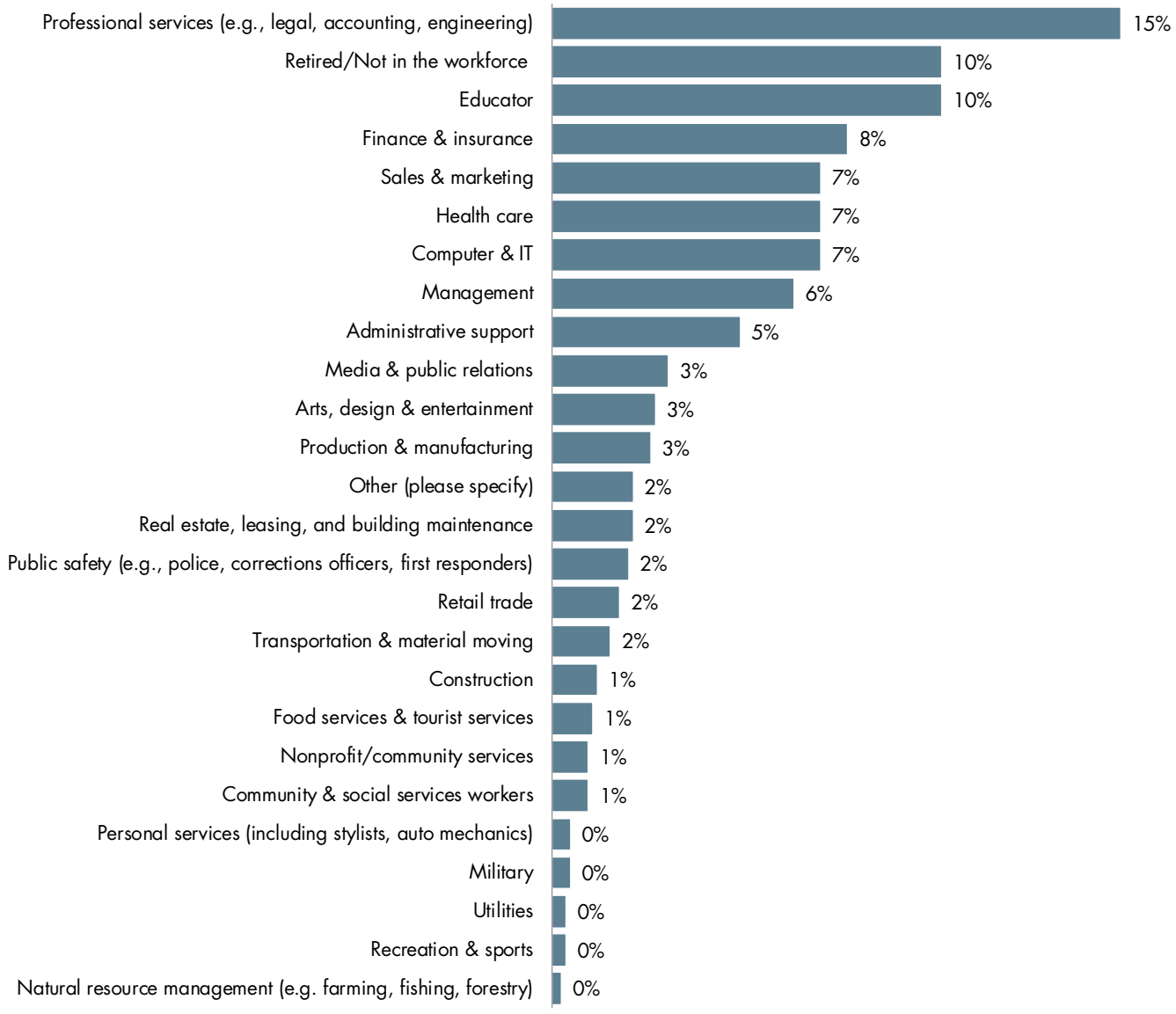


Source: Online survey of area residents conducted by TIP Strategies, April-May 2017.

A wide variety of occupations were represented in the survey, with professional services accounting for the largest share (15 percent). This broad occupational group includes a range of specialized occupations that are typically high-paying, including lawyers, engineers, architects, and designers.

Of the nearly 850 respondents that indicated their occupations, roughly 1 in 10 (10 percent) were not currently in the workforce. This figure includes retirees, students, and individuals who listed their occupation as homemaker, stay-at-home mom, etc.

FIGURE 149. DISTRIBUTION OF RESPONDENT OCCUPATIONS BY MAJOR CATEGORY



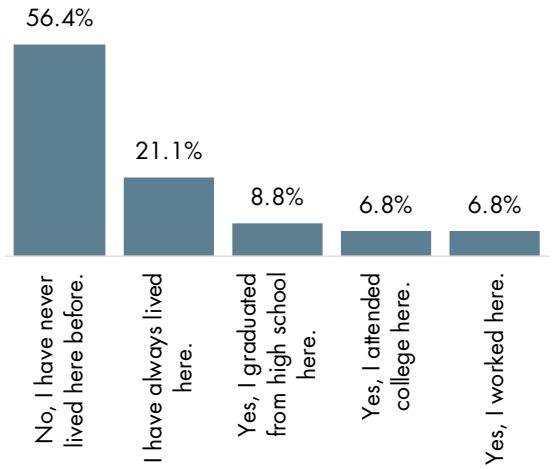
Source: Online survey of area residents conducted by TIP Strategies, April-May 2017.
Note: Occupations with 0% represent less than 1% of the total responses.

When asked if they had ever lived in Fort Worth previously, most respondents (56 percent) did not have prior ties to the city. Two out of five respondents (21 percent) had lived in Fort Worth all their lives. The remainder were more likely to have attended a local educational institution (16 percent had gone to college or high school in Fort Worth) than to have worked in the city. Of the more than 600 respondents who had moved to Fort Worth, the majority (56 percent) had relocated from another Texas community. Among the cities indicated, Chicago was the only non-Texas city to crack the top 10. This finding reinforces the migration tables presented in Section 3 (Figures 33-37, pages 39-43.)

Figures on the following pages explore factors that influence people's choice of residence. Figure 152 (page 145) overlays responses to two separate questions. The first asked respondents to rate the importance of various factors that typically affect decisions about where to live; the second asked them to rate Fort Worth's performance on each factor. Factors where residents' ratings of city performance lag their ratings of the factor's importance, such as the presence of "good schools and childcare options," suggest opportunities to improve performance and/or address residents' perceptions.

FIGURE 150. HISTORY OF LIVING IN FORT WORTH & LOCATION OF PRIOR RESIDENCE

LIVED IN FORT WORTH BEFORE?



IF MOVED, FROM WHERE? (TOP STATES)

	# OF RESPONDENTS	% OF TOTAL
Texas	349	56%
California	37	6%
Oklahoma	19	3%
Illinois	17	3%
Colorado	11	2%
Missouri	11	2%
Florida	9	1%
Georgia	9	1%
Kansas	9	1%
New York	9	1%
Pennsylvania	9	1%

IF MOVED, FROM WHERE? (TOP CITIES – ALL)

	# OF RESPONDENTS	% OF TOTAL
Dallas	35	6%
Arlington	24	4%
Austin	23	4%
Houston	15	2%
San Antonio	13	2%
Lubbock	13	2%
Chicago	9	1%
Weatherford	8	1%
Bedford	8	1%
Irving	8	1%

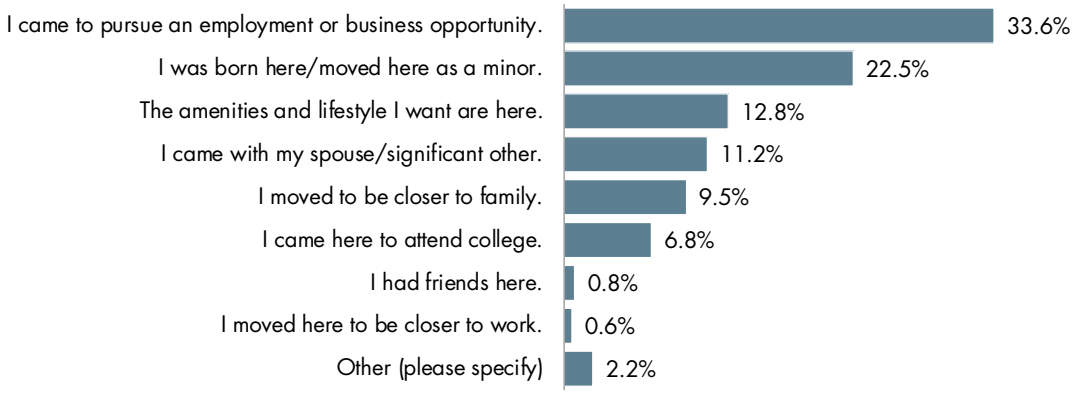
IF MOVED, FROM WHERE? (TOP CITIES – OUTSIDE TX)

	# OF RESPONDENTS	% OF TOTAL
Chicago	9	1%
Oklahoma City	7	1%
Denver	6	1%
Washington DC	6	1%
Atlanta	5	1%
Kansas City	5	1%
Memphis	5	1%
San Diego	5	1%
Los Angeles	4	1%
New York	4	1%
Omaha	4	1%

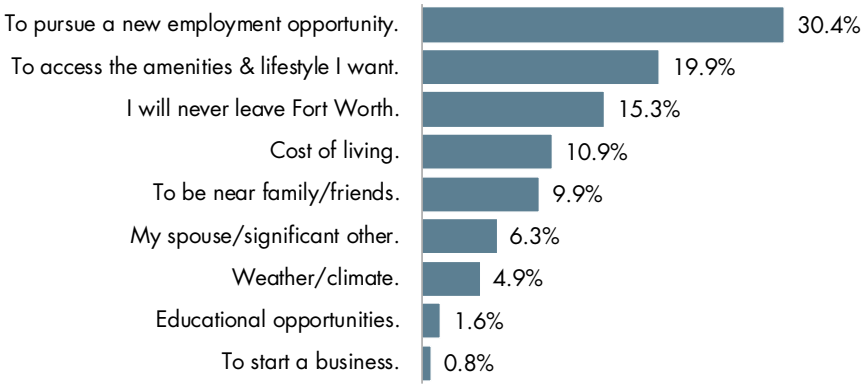
Source: Online survey of area residents conducted by TIP Strategies, April-May 2017.
Note: Eleven responses are shown in the bottom right figure due to a tie among the last three cities.

FIGURE 151. REASONS FOR RELOCATING TO/FROM FORT WORTH

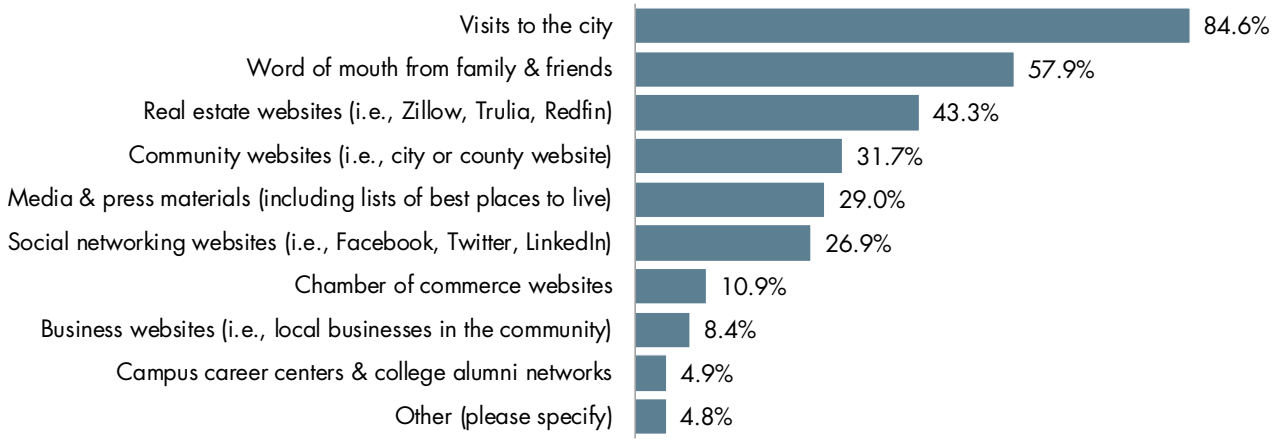
PRIMARY REASON FOR COMING TO FORT WORTH



TOP REASONS TO CONSIDER LEAVING FORT WORTH



TOP SOURCES FOR RELOCATION INFORMATION



Source: Online survey of area residents conducted by TIP Strategies, April-May 2017.
Note: Respondents could select up to three sources of relocation information, as a result the total percentage exceeds 100.

FIGURE 152. SELECTED FACTORS AFFECTING CHOICE OF WHERE TO LIVE
COMPARISON OF FACTOR'S IMPORTANCE WITH RESPONDENT'S PERCEPTION OF CITY'S PERFORMANCE

Source: Online survey of area residents conducted by TIP Strategies, April-May 2017.