

Raleigh-Durham International Airport North Carolina

March 16–21, 2014



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Development Strategies for a World-Class Airport

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About the Urban Land Institute

THE MISSION OF THE URBAN LAND INSTITUTE is to provide leadership in the responsible use of land and in creating and sustaining thriving communities worldwide. ULI is committed to

- Bringing together leaders from across the fields of real estate and land use policy to exchange best practices and serve community needs;
- Fostering collaboration within and beyond ULI's membership through mentoring, dialogue, and problem solving;
- Exploring issues of urbanization, conservation, regeneration, land use, capital formation, and sustainable development;
- Advancing land use policies and design practices that respect the uniqueness of both built and natural environments;

- Sharing knowledge through education, applied research, publishing, and electronic media; and
- Sustaining a diverse global network of local practice and advisory efforts that address current and future challenges.

Established in 1936, the Institute today has more than 32,000 members worldwide, representing the entire spectrum of the land use and development disciplines. ULI relies heavily on the experience of its members. It is through member involvement and information resources that ULI has been able to set standards of excellence in development practice. The Institute has long been recognized as one of the world's most respected and widely quoted sources of objective information on urban planning, growth, and development.

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About ULI Advisory Services

THE GOAL OF ULI'S ADVISORY SERVICES program is to bring the finest expertise in the real estate field to bear on complex land use planning and development projects, programs, and policies. Since 1947, this program has assembled well over 400 ULI-member teams to help sponsors find creative, practical solutions for issues such as downtown redevelopment, land management strategies, evaluation of development potential, growth management, community revitalization, brownfield redevelopment, military base reuse, provision of low-cost and affordable housing, and asset management strategies, among other matters. A wide variety of public, private, and nonprofit organizations have contracted for ULI's advisory services.

Each panel team is composed of highly qualified professionals who volunteer their time to ULI. They are chosen for their knowledge of the panel topic and screened to ensure their objectivity. ULI's interdisciplinary panel teams provide a holistic look at development problems. A respected ULI member who has previous panel experience chairs each panel.

The agenda for a five-day panel assignment is intensive. It includes an in-depth briefing day composed of a tour of the site and meetings with sponsor representatives; a day of hour-long interviews of typically 50 to 75 key community representatives; and two days of formulating recommendations. Long nights of discussion precede the panel's conclusions. On the final day on site, the panel makes an oral presentation of its findings and conclusions to the sponsor. A written report is prepared and published.

Because the sponsoring entities are responsible for significant preparation before the panel's visit, including sending extensive briefing materials to each member and arranging for the panel to meet with key local community members and stakeholders in the project under consideration, participants in ULI's five-day panel assignments are able to make accurate assessments of a sponsor's issues and to provide recommendations in a compressed amount of time.

A major strength of the program is ULI's unique ability to draw on the knowledge and expertise of its members, including land developers and owners, public officials, academics, representatives of financial institutions, and others. In fulfillment of the mission of the Urban Land Institute, this Advisory Services panel report is intended to provide objective advice that will promote the responsible use of land to enhance the environment.

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The panel extends its sincerest thanks to Michael J. Landguth and all of the Raleigh-Durham International Airport staff involved in planning and executing the panel. In addition, thanks go to JDavis Architects for their part in assisting RDU with briefing book preparation and assembly. The panelists also extend their gratitude to all of the interviewees who contributed their time and insights to this process.

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Background and the Panel's Assignment

RALEIGH-DURHAM INTERNATIONAL AIRPORT

(RDU) sits on 4,900 acres in the center of three counties—Durham, Orange, and Wake—and provides regional service to the Research Triangle metropolitan region of North Carolina, colloquially known as “the Triangle.” More specifically, the area is best known for its three tier-one universities (Duke University, North Carolina State University in Raleigh, and the University of North Carolina in Chapel Hill); its high quality of life; and Research Triangle Park (RTP), the largest and one of the most successful high-technology research and development parks in the world. The airport is served by US 70, Interstate 40, and Interstate 540 and boasts parks and open space including Lake Crabtree Park and the William B. Umstead State Park, a 5,000-plus-acre park that shares the airport's eastern border. The airport serves around 9 million passengers annually, with nine major carriers serving 39 domestic and international destinations. As such, RDU generates an annual economic impact of \$8 billion to the Research Triangle region.



Regional map.

Study Area

All but five acres of the panel's 4,900-acre study area lie in Wake County, all operated by the RDU Airport Authority, in charge of the airport facilities and its operation. The authority is controlled by a board with representatives from the counties of Wake and Durham, as well as the cities of Raleigh and Durham.

The tract includes the land and facilities dedicated to airport operations and support, along with approximately 1,600 gross acres of land that are not related to or anticipated to be related to direct airport operations. The panel relied on site observations, interviews, and a 2011–2013 land planning study conducted on behalf of the RDU Airport Authority. The ULI panel determined that land with “aeronautical-related uses” is that with uses that involve



The developable portions of parcels A–E were the panel's main focus. However, airport-related sites NBT and the existing car-rental facility were also considered in the panel's recommendations.

runways, taxiways, hangars, terminals, flyways, parking areas, maintenance facilities, and other portions of the property used or to be used in relation to the primary purpose of the airport. The primary non-aeronautical-related properties are identified on page 7. The developable gross and net acreage of these parcels as determined by the land planning study can be found in the table at right.

The land planning study did not, however, address two additional sites that are airport-related and referenced in the panel's recommendations: the existing car rental complex and the approximately 400-acre site referred to as Parcel NBT. Over the past 15 years, NBT has been proposed for three large-scale aeronautical developments, and is located close enough to aircraft operations to be considered for an airport-related but nonoperational third-party use.

In addition, because of the airport's interdependence with the Triangle region, the panelists also included in their study regional ground transportation, adjacent and regional land uses, and development data for nonairport uses such as office, industrial, hospitality, and retail.

The Panel's Assignment

ULI was engaged by the Raleigh-Durham International Airport Authority to address land owned by the airport that is not designated or may be required for future aeronautical purposes in a manner that benefits the Research Triangle region, and to identify additional long-term revenue to the airport authority that complements the operation of the airport.

To properly evaluate the land within the study area, the panelists determined that their report should take into account connectivity, competition, demand, and policy of the surrounding communities to make their recommendations for the authority. In doing so, the panel visited and researched business parks, nearby mixed-use developments, and the central business districts of Raleigh and Durham. The panel's findings and recommendations have by necessity considered the regional needs of the Triangle in addition to the specific and local needs of the authority. In doing so, the panel considered the proximate relation-

Gross and Net Developable Acreage

Tract	Gross acreage	Net acreage
A1	31.4	5.88
A2	65.5	17.15
A3	11.7	5.97
A4	18.3	9.88
A5	29.1	16.05
A6	29.7	15.56
A7	61.4	29.20
B1	58.4	28.64
B2	103.6	41.54
B3	57.1	25.00
C1	40.9	10.36
C2	91.8	46.76
C3	9.0	4.72
C4	105.5	33.44
C5	85.4	33.48
C6	84.2	31.54
C7	118.9	13.51
D1	33.0	13.94
D2	126.2	52.67
E1	15.4	9.12
E2	9.3	3.65
E3	11.5	3.81
E4	19.9	12.14
E5	8.3	3.12
E6	9.4	4.03

Source: Land Planning Study, RDU, 2011–2013.

The table summarizes the gross and net developable acreage for each parcel in the land planning study.

ship of the airport with Umstead State Park, recognizing the importance of the park to the community and the value that the park adds to the airport's non-aeronautical properties. In the same manner, the panel found that the RTP is integral to the future of the airport's aeronautical and non-aeronautical activities.

Summary of Recommendations

The panel made two overarching recommendations that should be seen as this report's primary themes: (1) public leadership, community outreach, and transparency are essential, especially given the disparate regional needs that seem to make the RDU an effective neutral member of the region's leadership; and (2) because of market and economic realities, a focused and deliberate, incremental development strategy should be implemented that should begin with master planning and a professional marketing program.

The panel believes that successful and timely development of additional revenues through the RDU Airport Authority's landholdings will occur only if the authority develops a focused strategy that is based on forward thinking accompanied by the ability to respond quickly to changes in the marketplace. The risk profile of the authority must include the ability to measure market conditions, to make modest assumptions about the future direction of the market, and to invest time and capital to incrementally prepare shovel-ready locations to capture prospective land users with real estate needs in the region. The panel's experience is that the recommendations listed in the implementation section of this report provide the methodology to accomplish the results anticipated herein. The authority needs to demonstrate a strong sense of participation and influence in the region as a neutral leader. Toward those ends, the panel recommends that the authority take the following steps:

- Establish a master-developer position either by third-party contract or a direct hire;
- Engage regional growth organizations to influence and learn from them; and
- Develop and implement a land use concept plan to aid the staff and board in understanding the economic risks and rewards of individual site development.

In pursuing these recommendations, the panel developed the following guiding principles:



RDU's Role in the Region

RDU's role in the region should be as follows:

- Become an airport that provides a world-class passenger experience;
- Capitalize on the perception that RDU is "neutral ground" in the region in close collaboration with the other "neutral ground," the RTP;
- Make RDU an active leader in the region;
- Brand the airport as a customer-friendly innovation and sustainability leader; and
- Create an iconic identity for RDU.

The location of RDU, in the heart of the Research Triangle region (pictured above), makes it an integral asset to the region's economic growth and high quality of life.

Economics and Development

To ensure the most appropriate development plan, RDU should begin the following:

- Develop and implement a strategic plan for development of the airport:
 - Aeronautical
 - Consider future needs for surplus terminal area land; and
 - Consider airport needs for future runway, passenger service facilities, and cargo;

- Non-aeronautical
 - Identify and plan sites for development, including analysis of uses, engineering, development costs, and marketing tactics; and
 - Hire a focused and dedicated land use expert;
- Identify additional revenue from surplus land:
 - Aeronautical; and
 - Non-aeronautical;
- Use surplus land to strengthen the airport's identity and functionality;
- Add complementary income-producing uses where expenses are lowest;
- Coordinate other uses within the region for appropriate synergies;
- Optimize use and efficiencies through real-time data and sensing technologies to create a "smart" airport; and
- Establish the airport as a destination for development investments.

Environment

Environmental integrity must be a cornerstone of RDU's development strategy, and should begin with the adoption of the following:

- Strengthening RDU's branding as a good steward of the land;
- Capitalizing on locational environmental advantages of surplus land parcels such as water and forests;
- Creating a comprehensive sustainability plan that includes energy efficiency, use, and production, as well as environmentally sensitive stormwater management, landscape maintenance practices, air quality, and carbon emissions; and
- Protecting open spaces within and around developed property.

Transportation

As a regional hub, RDU should enhance its role in transportation by

- Increasing the airport's connectivity to the region via car, truck, transit, and air through active and deliberate participation in the community process and on-site improvements to provide connections to future public transit and highway improvements; and
- Capitalizing on and planning for transportation innovation to increase capacity without premature major capital expenditures.

RDU's proximity to a host of natural assets like Umstead State Park offers ample opportunity for future development if done with the utmost degree of care. Environmental stewardship is critical to ensure the long-term vitality of the local environment and for the selection of appropriate land uses that the community can enjoy.



Economic and Market Overview

UNDERSTANDING THE SOCIOECONOMIC TRENDS

that affect the study area can help decision makers, the community, and planners identify the potential and pressure for future land uses. ULI believes that successful urban planning and land use policy can best be described as public action that generates a desirable, widespread, and sustained private market reaction. Therefore, Advisory Services panel reports typically have their foundation in market realities and economic development possibilities.

Regional Demographic Trends

The following analysis contemplates population trends for Durham County and Wake County, as well as the 15-county region represented by the Research Triangle Regional Partnership (RTRP). Comparable Orange County data sets were not readily available for every element of the analysis; however, Orange County growth is reflected where the data sets were available, and Orange County is included in the 15-county regional analysis.

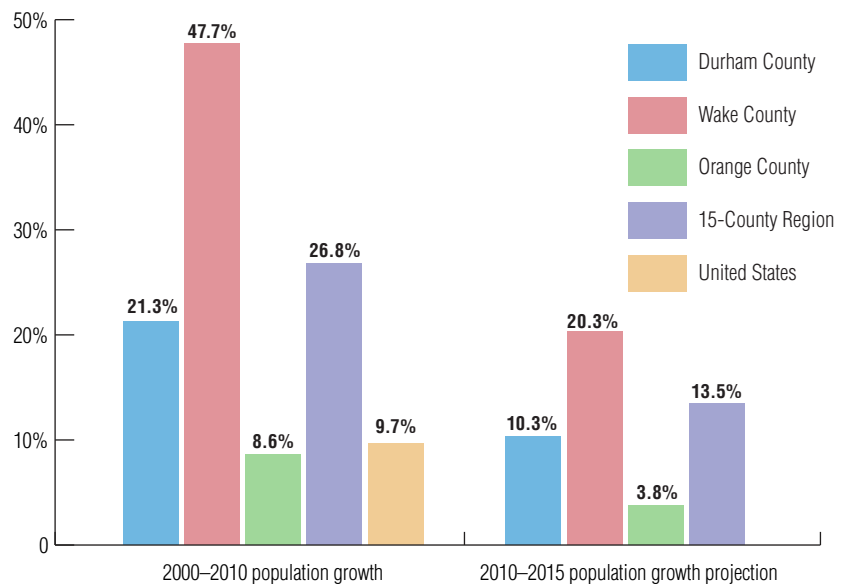
Population Growth

According to the Research Triangle Regional Partnership, the 15-county region served by RDU reported a total population of 1,692,848 in 2000, jumped 26.8 percent to 2,174,340 in 2010, and is expected to jump another 13.5 percent to 2,467,831 by 2015.

In the counties located closest to RDU—Wake and Durham—the total population in 2010 was 1,198,078, representing a 40.7 percent increase since 2000. According to the Research Triangle Regional Partnership Market Overview, the combined population across these two counties is expected to climb another 18.1 percent by 2015 to 1,414,864. Publicly available data sets for Orange County were not available for inclusion in this analysis.

When these regional growth trends are compared with the 9.7 percent population growth across the United States between 2000 and 2010, the region has demonstrated explosive population growth over the 2000-to-2010 decade, with the expectation of continued growth over the coming years (see figure).

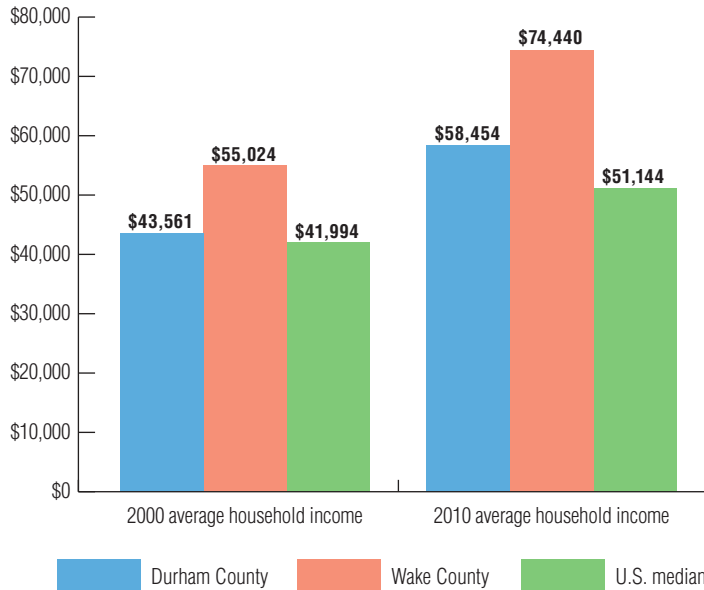
Population Growth Trends and Projections, 2000–2015



Sources: Research Triangle Regional Partnership, Market Overview, Durham County and Wake County; U.S. Census Bureau, Population Distribution and Change, 2000 to 2010, 2010 Census Briefs.

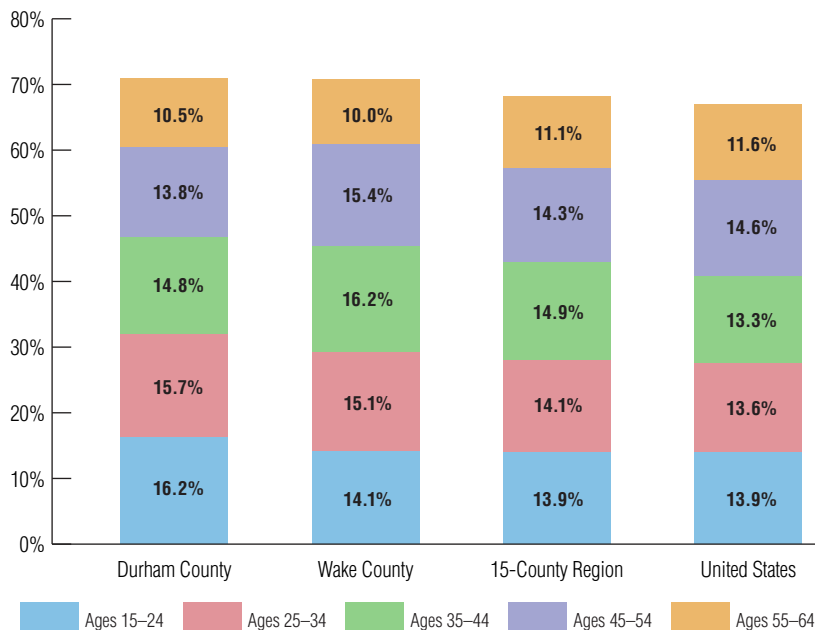
ULI's *Emerging Trends in Real Estate 2013* ranked Raleigh as the number-one in-migration destination in the United States, with 2 percent of total population in 2013 being derived from in-migration. And according to Moody's Analytics, in-migration in 2010 came from other parts of North Carolina; New York; Washington, D.C.; and Georgia. This fact underscores the attractiveness of the region to draw population from other areas.

Average Household Income, 2000 and 2010



Sources: Research Triangle Regional Partnership, Market Overview, Durham County and Wake County; U.S. Census Bureau, Population Distribution and Change, 2000 to 2010, 2010 Census Briefs.

Age of Working Population Aged 15–64, 2010



Sources: Research Triangle Regional Partnership, Market Overview, Durham County, Wake County, 15-County Region; U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2010.

Gains in Household Income

Average household income in the 15-county region was \$72,848 in 2013 and is expected to rise by 15.6 percent to \$84,235 by 2018 according to the Research Triangle Regional Partnership Market Overview.

The overall income trends in the area are very strong in comparison with national averages, and the projected income growth trajectory demonstrates continued strengthening in the region's economic well-being. As income levels rise across the region, one can reasonably assume that area residents will continue to use the airport, perhaps even more frequently, for personal and business travel.

Workforce Dynamics

Research Triangle Regional Partnership data show the median age was 34.5 years in Durham County and 34.8 years in Wake County in 2010, and 33 years in Orange County in 2009. Across the 15-county region, the median age in 2010 was 35.8 years. Comparatively, the 2010 median age across the United States was 37.2 years according to the 2010 U.S. Census.

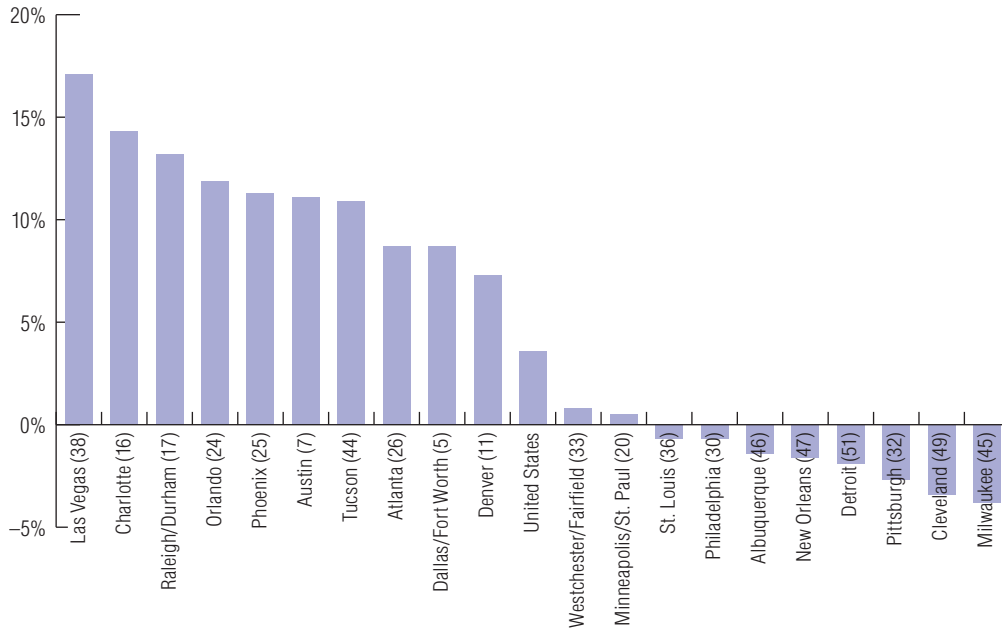
Consistent with the overall population snapshot, the working-age population for the region trends young as well. In 2010, the largest working-age population group was 15- to 24-year-olds in Durham County, representing 16.2 percent of the total, and 35- to 44-year-olds, representing 16.2 percent of the total, in Wake County. Also in 2010, the largest working-age population group in the 15-county region was 35- to 44-year-olds, representing 14.9 percent of the total, and the largest working-age population group in the United States was 45- to 54-year-olds, representing 14.6 percent of the country's total population.

ULI's *Emerging Trends in Real Estate 2014* anticipates that the Raleigh-Durham area will experience the third-highest five-year growth in population for ages 20 to 34 of any area in the country, as the graph at the top of page 13 illustrates.

The Talent Dividend

The availability of a talented and educated workforce is one of the most significant driving forces in economic

Five-Year Projected Growth in Population Aged 20–34

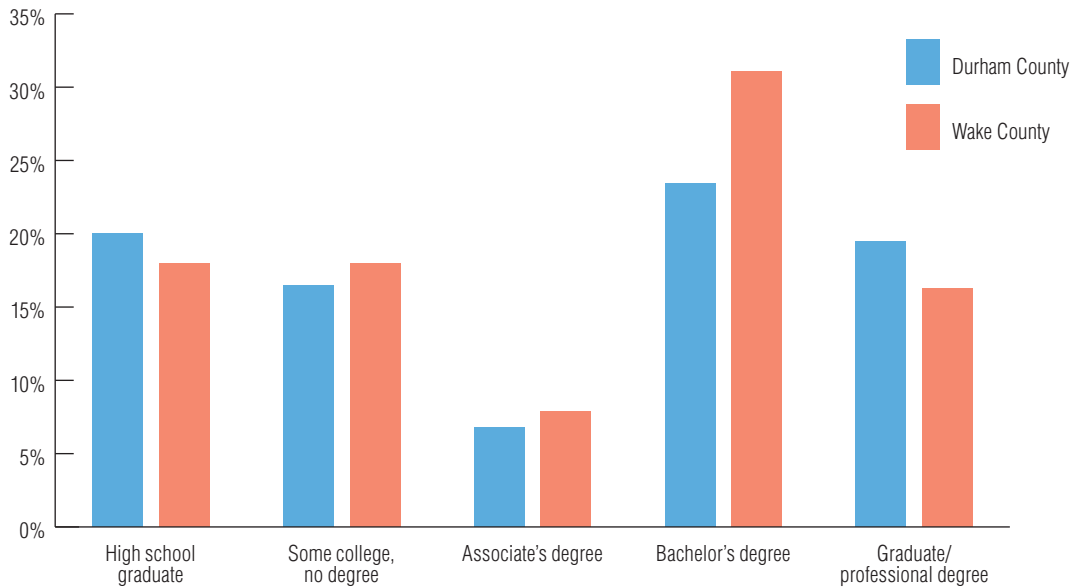


Sources: U.S. Census Bureau, Moody's Analytics (from Emerging Trends in Real Estate 2014).

development and business recruitment. Realizing economic growth through human capital, the region is in a strong position. In 2010, 47.4 percent of Wake County's population over the age of 25 had a bachelor's degree or higher, and 40.9 percent of Durham County's population over 25 had a bachelor's degree or higher. Comparatively, the 2010 U.S. Census Bureau American Community

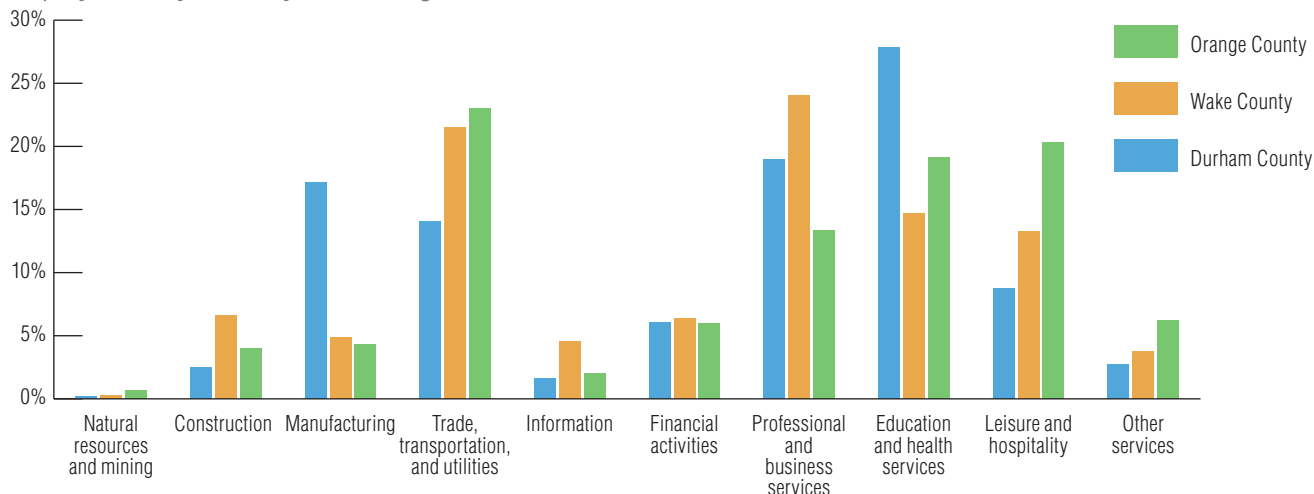
Survey One-Year Estimates indicate 26.4 percent of North Carolina's over-25 population had a bachelor's degree or higher, and the national average in 2010 for that age group was 30 percent. Across the 15-county region in 2013, 36.4 percent of the population over the age of 25 had a bachelor's degree or above, as shown in the graph below.

Educational Attainment by County, 2010



Source: Research Triangle Regional Partnership, Market Profile, Durham County and Wake County.

Employment by Industry, Percentage of Total, 2012



Source: U.S. Bureau of Labor Statistics, 2012.

As of December 2013, the 15-county region's unemployment rate was significantly lower than state and national averages, and employment growth was significantly higher than state and national averages. Specifically, the 15-county region had an unemployment rate of 5.7 percent, while the state of North Carolina experienced unemployment of 6.7 percent and the nation experienced unemployment of 6.5 percent. Over the 2008–2013 period, the 15-county region experienced employment growth that was significantly higher than that experienced by the state and country. The 15-county region experienced employment growth of 4.9 percent, compared with 2.9 percent growth in the state and 0.7 percent growth nationally.

Quality of Life

Another important element of a regional demographic profile is cost of living, which influences quality of life and the region's ability to attract and retain talent throughout the life cycle of employment. According to the Research Triangle Regional Partnership, Durham and Wake counties offer a cost of living that is lower than the national average. Cost of living is commonly computed using a 200-point index, with 100 serving as the national average. The cost of living in 2013 in the city of Durham in 2013 was estimated at 92.7 and in the city of Raleigh at 93.6 (*2013 State of*

the Research Triangle Region, Research Triangle Regional Partnership).

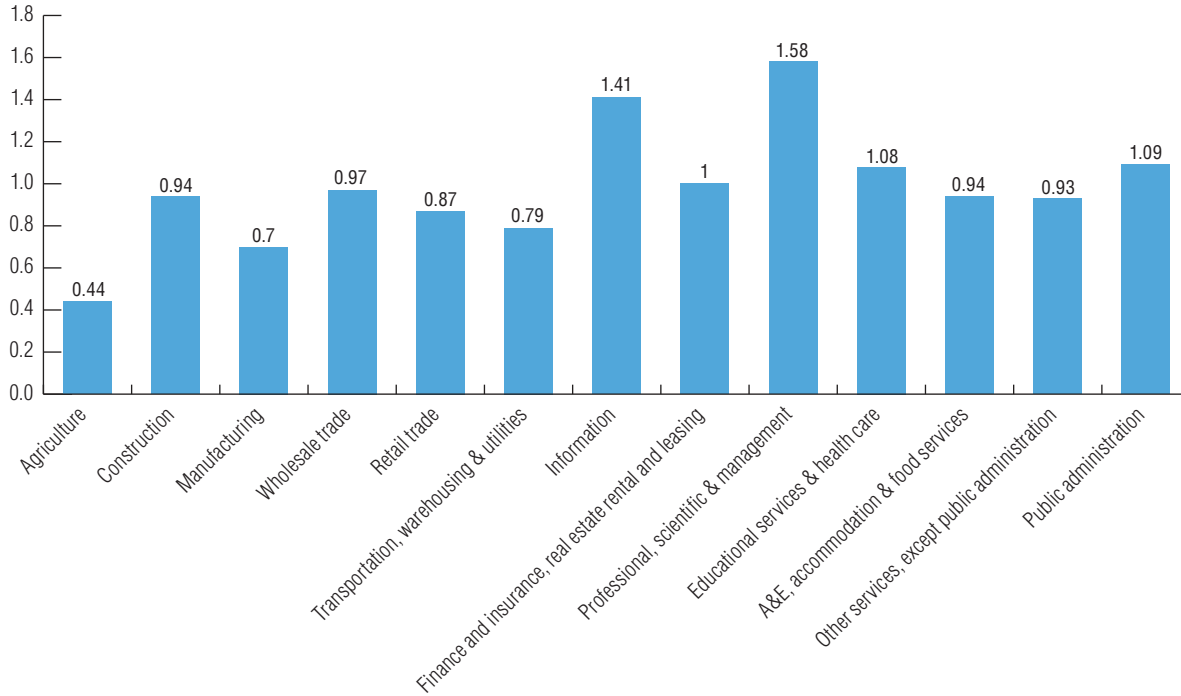
The overall cost of housing in Durham and Raleigh also was well below the national average of 100 in 2013. The cost of housing in Durham was 76.6, and the cost of housing in Raleigh was 80.7.

In addition, overall commute time to work is an important element of quality of life. Lower commute times are generally accepted as translating into a higher quality of life. In 2000, the average travel time to work was 21.4 minutes in Durham County, 24.7 minutes in Wake County, and 22 minutes in Orange County, according to the Research Triangle Regional Partnership's *Market Profile, Durham County and Wake County*. Nationwide, the average travel time to work in 2000 was 25.5 minutes according to the U.S. Census Bureau.

Gen-Y Preferences

The high concentration of young people in the region, particularly in the counties directly adjacent to RDU, is a significant finding. "Millennials"—or "echo boomers" or "generation Y" as they are often called—are defined as people born between 1979 and 1996. Their dominant lifestyle preferences deviate from those of previous generations.

Location Quotients: Durham Compared with North Carolina, 2008–2012



Source: U.S. Census Bureau, American Community Survey Five-Year Estimates, Industry by Occupation for the Civilian Employed Population 16 Years and Over—Universe: Civilian Employed Population 16 Years and Over, 2008–2012.

The anticipated growth of the millennial population in the region will generate new product demand in the real estate market. Introducing innovative and sustainable design elements will benefit the RDU landside development plan and appeal to the younger market. The planning and design section of this report highlights strategies for achieving this objective.

Employment Sectors to Watch

When 2012 employment by industry in Wake and Durham counties is analyzed, cumulative strength in three supersectors becomes apparent: professional and business services; education and health services; and trade, transportation, and utilities. The employment breakdown across counties is as follows: The professional and business services supersector makes up 24.01 percent of total employment in Wake County, 18.96 percent of total employment in Durham County, and 13.37 percent of total employment

in Orange County. The education and health services supersector represents 27.85 percent of total employment in Durham County, 14.68 percent of total employment in Wake County, and 19.11 percent of total employment in Orange County. The trade, transportation, and utilities supersector makes up 21.53 percent of employment in Wake County, 14.08 percent employment in Durham County, and 23.87 percent of total employment in Orange County.

In Durham County, the manufacturing sector demonstrates significant strength, representing 17.19 percent of total employment; however, the manufacturing sector represents only 4.87 percent of total employment in Wake County and 4.32 percent of total employment in Orange County. Similarly, the leisure and hospitality sector demonstrates strength in Orange County, representing 20.35 percent of total employment; however, this sector represents only 8.79 percent of total employment in Durham County and 13.28 percent of total employ-

Durham's Projected Top-Five Occupations

Occupation	Projected growth by 2018 (%)
Biomedical engineers	77.8
Network systems and data communications analysts	45.3
Medical scientists (except epidemiologists)	45.2
Personal and home care aides	44.7
Dental hygienists	41.9

Source: America's Top-Rated Cities, Durham, North Carolina (Greyhouse Publishing).

ment in Wake County. The manufacturing sector and leisure and hospitality sector are not anticipated to be major influences on job growth or real estate markets in the immediate future.

Location Quotients

Location quotients determine which industries present a unique opportunity for the region. The ratio calculates the concentration of a particular industry cluster in comparison with the state of North Carolina. A location quotient over 1.0 means the sector is strong enough that it pulls employees from outside the region because the local workforce does not satisfy employers' demands. The region's professional, scientific, and management sector; information sector; and education and health care sector are particularly strong. U.S. Census Bureau American Community Survey Five-Year Estimate data show that the public administration sector also demonstrates strength in the region; however, the private markets do not drive this sector's growth, and therefore this report does not emphasize public administration as a priority sector for the region.

Further supporting the outcome of the location quotient analysis, America's Top-Rated Cities ranks the fastest-growing occupations in Durham by 2018, which are representative of the three supersectors discussed. The top-five occupations expected to experience significant growth in Durham between 2008 and 2018 are shown in the table at the top of the page.

These sectors highlighted in the location quotient analysis as well as the 2012 employment data make up what is known as the "knowledge economy." *The Oxford English Dictionary* defines the knowledge economy as "an economy in which growth is dependent on the quantity, quality, and accessibility of the information available, rather than on the means of production." These sectors require a highly skilled workforce and are often located near institutions of higher learning. Given the 164,000 higher-education students enrolled in the region and the 32,000 annual college graduates, it makes sense that the knowledge economy is growing the region. Also supporting the knowledge economy are unique assets such as North Carolina Central University's Biomanufacturing Research Institute and Technology Enterprise and the North Carolina State Biomanufacturing Education and Training Center.

The Triangle's distinct competitive advantages are brought to light in this demographic and industry analysis and show not only that the region is growing at a robust pace but also that a significant concentration of young people reside in the area. Incomes across the region are rising faster than national averages, and job growth in the knowledge economy is anticipating high levels of growth.

In effect, the economic performance of the region directly affects the development potential of RDU's landside parcels. As population grows, demand for goods and services increases, providing new opportunities for private economic investment for RDU. As incomes grow, spending grows, supporting increased passenger trips for RDU. As the knowledge economy grows, higher demand for real estate provides opportunity for office, commercial, and mixed-use development at RDU. And as the population gets younger, real estate markets change, providing opportunity for RDU to introduce innovative site design to attract the highest and best use of each parcel and to promote sustainability and connectivity.

Real Estate Market Potential

The following sections identify and analyze major market trends by land use primarily with data provided by NAI

Carolantic Real Estate Services. According to ULI's *Emerging Trends in Real Estate 2014*, the Raleigh-Durham market ranked among the top 20 U.S. markets to watch in 2014, in part because of its high-quality jobs in science and technology, education, and health care. Based on the region's overarching economic competitiveness, as well as on recent and projected trends and site conditions, potential may exist for a landside business hotel with meeting space in the near to medium term; for multipurpose (flex/warehouse) space in the medium term; and for office use in the long term. All will require advance planning to entitle to get sites shovel-ready, as well as careful sequencing in order to build the market for higher-value product over the long term.

Site Opportunities and Constraints

Site opportunities and constraints informed identification of specific development products for investigation. The outparcels—those parcels controlled by the authority outside the airport perimeter—benefit from offering large footprints, as well as access to natural assets such as Umstead Park and Lake Crabtree Park. They also offer excellent vehicular access to interstates 40 and 540 and U.S. Route 70. Perhaps of greatest significance, a location near RDU guarantees rapid access to the airport and—should links with regional transit systems expand in the future—the opportunity to locate near a major multimodal transit center providing rapid access throughout the region and beyond.

Constraints are also present. First and foremost are those development constraints created by requirements and market impacts associated with airplane noise, which restrict incompatible (i.e., residential) uses on properties with decibels within the 65 day-night average sound level, which precludes residential development on parcels B and E and portions of parcel A. The prevalence of wetlands similarly requires sensitivity with regard to development. In seeking development, RDU faces competition with a number of more established markets in the region, which offer greater amenities and fewer of these constraints. Finally, new uses introduced around RDU should not limit

the airport's flexibility to expand on other undeveloped parcels in the future.

Multipurpose (Flex/Warehouse)

Today, the Research Triangle region has 65 million square feet of multipurpose flex or warehouse space, of which approximately 38 percent is flex space and 62 percent is warehouse according to CBRE 2013 data. The largest cluster is situated in the RTP/I-40 submarket (39 percent), with the balance split between the Durham and west Raleigh/US-70/Cary markets. RDU is situated at the edge of the RTP/I-40 and Raleigh/US-70/Cary markets.

Multipurpose product saw robust growth across the Research Triangle region between 1990 and 2000, with average annual absorption of 7 percent. However, absorption dropped to an average of 1 percent annually from 2001 to 2012, with negative absorption in the 2001–2003 and 2008–2010 periods. The pace of construction has declined steadily in all submarkets since the Great Recession. Nonetheless, even at only 2 percent absorption in 2013, the market saw the completion of 514,000 square feet of warehouse space and 224,000 square feet of flex space. Over half of this was constructed in the RTP/I-40 submarket, which by many accounts is nearly out of space for new industrial construction, according to Cassidy Turley 2013 data. Moreover, limited construction has resulted in a significant decline in vacancy since 2008, to a little over 10 percent throughout the region and only 9 percent in the submarket that includes RDU.

The slow pace of current construction in the face of these falling vacancy rates suggests demand may be beginning to outpace construction. Given the scarcity of remaining property for development within the RTP/I-40 submarket—suggested in interviews to be enough to accommodate no more than ten years of demand—RDU is well positioned to capture this demand. The potential associated with multipurpose space will grow only if and when the volume of air cargo traveling through RDU increases in the future, as suggested by global airport trends, which are examined in a latter section of the report.

Office

The Research Triangle office market encompasses 63 million square feet across Wake, Durham, and Orange counties. The largest submarkets include RTP (25 percent), Cary (approximately 13 percent), and downtown Raleigh (8 percent), with the remainder dispersed across downtown Durham and suburban locations. Major office locations near RDU include the 7,000-acre RTP as well as Perimeter Park.

As with multipurpose product, following strong absorption between 1990 and 2000 at a 6 percent annual rate, absorption slowed dramatically from 2001 to 2012 averaging only 2 percent annually over this period, with negative absorption in 2001 and 2010. RTP and surrounding properties—the submarket to which RDU is most closely situated—has in particular suffered from high rates of vacancy over this period, with a 22 percent vacancy rate in 2013. This has been attributed to the lack of amenities within RTP as well as the prevalence of build-to-suit construction. According to Jones Lang LaSalle (2013), central business districts have proved the strongest during this period, with Class A space in downtown Raleigh asking the highest rents (\$24.65 per square foot as of fourth-quarter 2013 compared with \$20.94 for Class A space in suburban markets) and sustaining the lowest vacancy rates (3.9 percent compared with 11 percent for Class A space in the suburbs).

Although absorption hovered around 2 percent in 2013 (approximately 800,000 square feet), vacancy rates have fallen since 2010 and stood at 12.8 percent as of the fourth quarter of 2013, with 9.7 percent among Class A space. As a result, approximately 1.45 million square feet of new office space is now under construction across the region, dominated by build-to-suit projects such as MetLife's 427,000-square-foot building in Cary. Anticipated employment growth suggests a strong basis for future office construction; while the region added slightly over 30,000 jobs between 2006 and 2012, it is projected to add nearly 80,000 more by 2017 as it continues to recover from the recession faster than the country as a whole, according to Moody's (2013). For those jobs situated in office space, HR&A (2014) estimates that each

job supports approximately 250 square feet of space, suggesting opportunity for additional space needs to accommodate this growth.

As in most communities in the United States, office market metrics within the Research Triangle region have not been compelling since the recession—or even before. More recent declines in vacancy and strong employment projections provide a basis for cautious optimism across the region. Submarkets with urban amenities will be best positioned to capture future growth; indeed, interviews with tenants within the region identified these as essential to locational decisions, suggesting that office development near RDU will greatly benefit from both providing such amenities and seeking tenants with a particular interest in locating close to the airport. Moreover, because build-to-suit projects dominate new construction, landowners with sites ready for construction will be best positioned to capture future office expansion.

Residential

Although single-family home sales are on the upswing following a precipitous decline between 2006 and 2009, a lack of continuity of the subject parcels with other residential communities would impede establishing a critical mass of single-family homes sufficient to establish a neighborhood. This analysis therefore focuses primarily on multifamily housing.

Multifamily product represents an important part of the housing market in Raleigh-Durham, attracting many of the young workers employed in the technology and research and development sectors. An analysis of building permit data from the U.S. Census Bureau shows that multifamily development represented a particularly large portion of residential development in the region between 2006 and 2009. Not only has the average number of new units for multifamily developments grown, but also its overall share of new residential development in the region increased substantially between 2000 and 2009.

Residential value is most influenced by location, including proximity to amenities such as retail, nightlife, good schools, and desirable communities. Although Wake

County residential properties command a premium relative to other counties, reportedly because of perceived school quality among families, multifamily residential commands higher values closer to Raleigh's active downtown. Major multifamily developments near RDU include the Brier Creek development, which provides a mix of multifamily and attached houses within walking distance of an associated shopping center. Rental units fared better than condominiums during the market downturn, reportedly reflecting a shift in attitude among younger customers about the value of owning a home as a good investment. Several projects intended as condominiums in the area were converted to rental apartments.

Vacancy rates in the regional apartment rental market dropped from 9.5 percent in 2009 to 5.5 percent in 2012, while absorption hovered around 2,000 units per year, with greater bursts of activity in 2003 and 2009. Data provided by NAI Carolantic Realty show that the recession constrained new development significantly, fueling the decrease in vacancy; residential permits for both single-family and multifamily dropped by half during this time, to levels not seen since the 1990s.

Builders responded to the low vacancy rates, and construction has resumed at a high volume. Absorption rose in 2013 to 2,600 multifamily units, and 9,000 units are under construction today, with more than an additional 11,000 in the pipeline. However, according to Carolantic, the increased supply is expected to increase vacancy as well, which rose only slightly to 5.9 percent in 2013 but is projected to hit 8 percent in 2014.

Although proximity to the airport is unlikely to drive residential demand, the scenic lake and woodlands on parcel D provide an opportunity to consider construction of multifamily property. The site will compete with others providing walkable dining and retail amenities that appeal particularly to younger residents and in the near term faces significant competition from new construction already in the pipeline. Additional transit connections that establish the airport as a multimodal hub in the future will increase

the location's draw for residents (as well as the value of residential properties beyond RDU's perimeter).

Ultimately, although a market may exist for multifamily on RDU properties beyond the constraints created by noise, a larger consideration for RDU may be the impact that the introduction of residential uses on its properties could have on flexibility with regard to future expansion decisions. This is a discussion for the RDU board.

Hotel

As of March 2014, PFK Hospitality Research data indicate the Raleigh-Durham market offers 27,098 hotel rooms. Demand for hotel rooms rose by 5.4 percent over the last five years, faster than the 2.3 percent increase in supply. Demand rose more dramatically for upper-priced hotels, increasing by 6.7 percent over this period as compared with a 4.4 percent increase for lower-priced hotels. According to the Greater Raleigh and Durham Convention and Visitors Bureaus, Wake and Durham counties averaged annual absorption of 520 rooms between 2003 and 2013.

Among the six hotel submarkets of the Raleigh-Durham region, the Research Triangle/Airport is the largest, with 25 percent of regional hotel rooms. The prevalence of upper-priced hotel rooms (e.g., Hilton Garden Inn, Double-Tree, Embassy Suites) has grown in recent years; they now account for 51 percent of rooms in the Research Triangle/Airport submarket, a prevalence of upper-priced product equaled only by the adjacent Crabtree Mall submarket, and surpassing the Durham/Chapel Hill submarket.

A total of 563 rooms is under construction, with another 2,636 in the pipeline at various stages of planning and construction, which—if and when completed—will increase supply in the region by nearly 10 percent. With an average of 520 rooms added per year from 2003 to 2013, this pipeline is sufficient for six years of delivery. The Research Triangle/Airport submarket is keeping pace with the rest of the region; 308 rooms are under construction and another 365 are in final planning, with potential to grow this submarket by 10 percent according to PFK Hospitality Research (2014).



The land adjacent to RDU already features mixed development: multifamily and single-family detached homes in Brier Creek, the Crabtree Valley Mall, and nearby flex/warehouse facilities.

Average daily rates for hotels near RTP and the airport are approximately 5 percent higher overall than those for the Raleigh-Durham metropolitan area, driven by lower-priced hotel costs rather than upper-priced hotels, which commanded 2013 rates 3 percent lower than those seen across the market. After a decline in rates in 2009 and 2010, average daily rates have been on an upward trajectory for the last few years, though the pace of growth has slowed to approximately 1 percent, consistent with marketwide trends in 2013 shown by PFK Hospitality Research data (2014).

Occupancy for hotels in the Raleigh-Durham metropolitan area overall, including those in the vicinity of RDU, has increased significantly since 2009 and now stands at 62.1 percent—66 percent in the RDU submarket. Occupancy within lower-priced hotels grew from 54.4 percent in 2009 to 62.8 percent in 2013; occupancy within upper-priced hotels has grown even faster, from 56.8 percent to 68.8 percent over the same period, as indicated by PFK Hospitality Research data (2014).

During the next five years, additional growth in demand will be focused almost entirely on upper-priced hotels, with supply starting to outpace demand. PFK Hospitality Research (2014) projects demand for upper-priced hotels will climb 3.2 percent as supply increases by 3.8 percent.

In summary, the Research Triangle region's hotel market has seen solid growth over the last five years, though the pace of growth is slowing. The Research Triangle/Airport submarket has grown apace with the region but has seen particular growth among higher-priced hotels. A higher-priced business hotel with meeting space, particularly catering to business travelers interested in avoiding travel to early-morning flights, could leverage this shift in demand toward quality and reinforce RDU's reputation as a world-class airport. Its success would be reinforced, and possibly depend upon, a landside location that enables passengers to travel between the airport and the hotel by foot.

Retail

New retail on RDU properties—even that added primarily to serve associated new office or residential—will be in

a shopping center format, which constitutes 58 million square feet in the region currently according to PFK Hospitality Research data (2014). Data from NAI Carolantic Realty indicate that retail is strong within the region today, with significant declines in vacancy since the Great Recession in most submarkets, down to approximately 3 percent marketwide today. Low vacancy has been fueled by negligible new construction in the face of continued economic recovery.

Today, approximately 670,000 square feet of space is under construction, the vast majority in Cary (531,000 square feet), which already represents 23 percent of the market's square footage. Major suburban retail centers near RDU Perimeter Park and Brier Creek provide a ready retail base for residents and workers. Research Triangle Park is reportedly adding retail as part of the master plan implementation, though this retail is expected primarily to include dining and convenience rather than destination shopping. A new 435,000-square-foot retail development is also under construction nearby, at the Parkside Town Commons Town Center.

Large-scale shopping centers risk drawing significant amounts of vehicular traffic—a potential conflict with airport traffic. Any office or residential development at RDU will need to provide retail as an amenity to entice workers or residents. Yet while the retail market is strong, a sufficient number of retail destinations nearby RDU suggests that a stand-alone shopping center may face steep competition, in addition to requiring a significant footprint and generating associated traffic. In the future, a more distinctively designed center associated directly with the RDU terminal and with new hotel product there but outside security may provide a format that leverages future passenger growth at RDU and the demand that will continue to grow along with the region.

Beyond the Market

In addition to the need to understand revenue-generating market potential, RDU has the opportunity to serve as an economic development driver within the region—growth that (pending greater flexibility among airlines to expand

services) has the potential, in turn, to increase throughput at RDU and thus on-site revenue. Interviewees identified a number of creative uses and programs that, if located near the airport, may have some potential to contribute to economic development but are not market-based. These include an aviation museum, regional emergency medical services training, aerospace education, defense uses, flying instruction, community sports, event space, a high-tech amusement or water park, and support services for military personnel.

Implementation for each of these suggestions requires involvement of entities beyond RDU and access to adequate funding. However, should these or other financially feasible economic development opportunities arise, advance planning on behalf of RDU is necessary to ensure an effective response that better positions the airport, thereby building site value that attracts the right revenue-generating uses.

Transformation of the Airport's Non-aeronautical Operations

OVER THE PAST CENTURY AND DECADES, air transportation has evolved to meet the changing demands of society as a whole. Continued globalization has meant that the nature of world trade has changed—and continues to fundamentally change—the economic and demographic landscape of cities, regions, and countries. Underlying this change is the shift of basic manufacturing from developed economies to emerging economies.

Evolution of Air Transportation

Between 2010 and 2029, world air passenger traffic will more than double from 4.6 billion to about 11 billion, while air cargo, which accounts for about 30 percent of the value of world trade (1.5 percent by weight), will triple during the same period, according to Jack Kasarda of the Kenan Institute at the University of North Carolina. Although most of the increase in passenger traffic will be in the emerging economies, airports in developed economies will benefit from significant tourism opportunities. Airports are becoming major gateways in the movement of people and goods. Understanding this phenomenon is key to maximizing uses for non-aeronautical land while also better serving a growing and diverse customer base.

Competitiveness of Airlines and Airports

The airline industry has witnessed significant restructuring in recent years, caused mainly by the increasing costs of fuel charges and security concerns, especially since the 9/11 attacks, and the open-skies agreement that ended the monopoly of protected markets. Airlines have responded by merging and consolidating operations. Airline consolidation has driven a decline in the number of hubs, forcing some airports to scramble for their survival. The stiff competition is forcing airlines to increase their revenue

sources (by charging extra fees) and reduce some basic services, while at the same time demanding that airports reduce their airport charges.

Federal sources of financial support to airports are dwindling rapidly. The Federal Aviation Administration mandates that airports secure and diversify revenue sources. An additional mandate, by way of Federal Aviation Administration (FAA) grant assurances, requires airports to maintain a rates-and-charges system that achieves self-sustainability. As such, airports are encouraged to use airport land deemed as “excess” for non-aeronautical uses.

While airports are pressured to engage in the development of excess land, their primary responsibility and focus continue to be aeronautical developments and improvements. Their mission of running an efficient airport cannot be compromised.

Airport Revenue Diversification

Airports are under constant pressure to cut costs to the airlines and to diversify revenues. Mergers and consolidations have the potential to enable airlines to be in the driver's seat when determining airport operations costs such as landing fees, gate leases, and passenger service charges. The airlines are further scrutinizing non-aeronautical capital expenditures unless they are offset by corresponding revenues over time. Airports face mounting pressure to secure and increase non-aeronautical revenues to maintain or reduce charges on airlines.

Airports are constantly seeking ways to enhance passengers' experience at airports by introducing various revenue-generation strategies. According to the 2012 North America Concessions Benchmarking Survey, non-aeronautical revenue accounted for 44.8 percent, or \$7.56 billion. Smart airports have expanded their non-

aeronautical revenues from multiple sources with such targets increasing from the 40 to 50 percent range to the 75 percent range. Many airports aim to be in the 50 to 60 percent range to be competitive in the market. Excessive fees can translate into reductions in the number of flights because airlines cannot readily transfer these costs to ticket price costs for fear of losing customers. Although airport charges make up 4 percent of the cost of airline operation and are declining by about 1.6 percent per year according to the International Civil Service Organization, they have tremendous negative elasticity on consumer demand for buying airline tickets. As noted in an August 2013 article by Mark Johnson in the *Resource Daily News*, consumers are increasingly less loyal to airlines as they shop for the lowest prices, which is evidenced by the increasing number of discounted ticket brokers and by the increasing number of discount airlines emerging in markets.

Innovations in Airside and Landside Business Development

Both airside and landside businesses have shifted to reflect changing passenger preferences and security realities. Airside business operations are rapidly changing from the traditional fast food, video games, and newspaper stands to more diverse business opportunities. At the same time, however, due to post-9/11 security concerns that restrict terminal access to passengers only, the num-

Heathrow's "ULTra Pod," which transports passengers to and from parking lots, is part of an increasing trend toward smart-airport concepts. Adopting such concepts can help strengthen RDU's image as a regional hub for innovation and technology.



ber of airside businesses has decreased while the focus of their offerings has become more targeted. As such, there has also been an increase in landside businesses that offer dynamic uses that complement airside businesses.

Airside Business Development Innovations

The change in uses for airside business is evidenced by the push from new airports to incorporate their airside areas into sophisticated malls that provide a wide range of goods, such as high-end fashions, high-end restaurants and entertainment centers, sports bars, information technology (IT) shops, department stores, high-end jewelry stores, retail banks, automated kiosks such as Best Buy Express, and services such as the ability to use mobile apps to navigate airports and order food on the go, and a number of other amenities. According to an article published in the *New York Times* on August 1, 2011, airports are becoming a service facility like shopping malls. Attempts are being made to increase revenue per square foot by incorporating automated kiosks and virtual advertisements.

Airports bring significant consumer traffic compared with what large shopping malls bring. Large malls average about 9 million to 10 million consumers per year, but passenger traffic in most regional and hub airports exceeds this number. With higher disposable incomes than mall patrons, airport passengers generate revenues in airport malls that are two to three times the per-square-foot rev-

This Champagne bar at Amsterdam's Schiphol Airport is one of many such niche offerings catering to a wide clientele.



enue seen in traditional malls. As a result, airports stand to benefit, demanding higher rent from their tenants.

Emerging amenities in the airside areas include clinics, gyms, nondenominational chapels (including weddings), mini-museums, and bank branches. To meet demand, older airports are transforming and revamping their airside areas into more revenue-generating businesses. The continued focus of airports to improve and expand the shopping experience has created a niche industry of brokers who specialize in locating business in airports. An example of a world-class airport that balances such an offering of amenities is Schiphol International Airport outside Amsterdam, Netherlands.

Landside Development Opportunities

The shift in airside businesses has created the opportunity for other areas outside security areas to explore complementary business opportunities. Current trends have enabled landside businesses to expand their offerings to include the following:

- **Hotels/meeting facilities:** Emerging hotels with meeting facilities are now located near terminals, oftentimes connected by people-movers. Airport hotels are becoming virtual offices to traveling businesses and serve business travelers who would like to use meeting space without having to drive to inner-city locations.
- **Shops, restaurants, and gift shops:** Such businesses can also help capture nonpassenger customers in the RDU area.
- **Corporate headquarters:** Locating corporate headquarters in proximity comes with the potential to connect directly to the runway—such as the Dick’s Sporting Goods headquarters at Pittsburgh International Airport.
- **Fixed-base operators:** Fixed-base operators offer sophisticated services and amenities for corporate executives.
- **Efficient and consolidated car-rental places:** Having such facilities avoids the need for travelers to use buses from the airport to reach outparcel sites.

State-of-the-Art Cargo Operations

RDU has excellent multimodal connectivity to develop a cargo facility in the future. With the continued globalization of world trade, cargo operations will prove to be an important economic component of RDU’s aeronautical operations. The panel suggests setting aside adequate land of about 50 acres for the potential development of cargo operations that could include offerings such as refrigerated space, an animal hospital, and other related opportunities.

An International Niche in Cargo Operations

To catalyze the development of international cargo, the airport authority should work with regional civic, business, and political leaders. A unified effort could prove fruitful if inbound cargo flights can find loads during their outbound flights. Inbound international cargo is a great generator of jobs at various levels, including growing third-party logistics business, in loading and unloading cargo, sorting cargo, and trucking cargo to different locations. The focus of any joint effort should be identifying exportable products from the North Carolina region.

North Carolina has a rich heritage in forestry-based products such as furniture. In addition, the region is a major producer of pork products. Such products have broad international appeal in markets such as China. A coordinated partnership on behalf of the region’s leadership stands to better influence state policy and better serve all stakeholders. For example, a unified proposal at the state level could include legislation to provide tax credits for companies and forwarders when they export North Carolina products. Such an effort can currently be seen in Missouri, where the state government has advanced efforts to enact state tax credits to promote the export of exportable products, in order to secure inbound cargo (see “China Hub Makes Its Return to Missouri,” St. Louis CBS/local station, January 31, 2013).

Development Opportunities in the Identified Excess Properties

Airports are revisiting their organizational charts to include real estate development and management departments.

Brokers are incorporating airport real estate services to better market and develop airport properties.

Around airports, cargo activities, bonded warehouses, just-in-time manufacturing, freight forwarders, and third-party logistics facilities are expanding, just as the internet has enabled business-to-business and business-to-consumer transactions to grow significantly. According to e-Marketer, a digital media, media, and commerce market researcher, e-commerce has jumped from none in 1996 to \$1.1 trillion in 2012, with projections to reach \$2.3 trillion by 2017. *Internet Retailer* points out that business-to-business e-commerce has dramatically improved just-in-time manufacturing, thereby reducing raw material and finished-goods inventory. This cargo moves on wide-bellied passenger aircraft and dedicated cargo planes, with a multiplier effect of increasing cargo operations and expanding employment opportunities for entire regions. To this effect, clusters of businesses are increasingly found in and around airports.

RDU has identified roughly 1,600 gross acres that are not considered essential for aeronautical uses (excess properties) in several parcels identified as A, B, C, D, and E. Some of the sites have significant challenges with evidence of wetlands, swampy areas, elevation issues, and proximity to flight zones.

Consensus exists across the business, educational, and civic communities that the sites could be developed in a manner that could add value to the region's economy. Regional and international airports have master-planned their excess properties, sometimes in conjunction with other privately controlled land, in aviation-driven developments and other development opportunities, which can include the following:

- **General office parks:** These can serve multiple users with shared parking, common amenities such as eating establishments, and common services.
- **Hospitality corridor:** Such corridors support a cluster of multiple hotel developments close to highways and future transit locations.

- **R&D parks:** Any research and development (R&D) park must be supported by local universities. Centers of excellence such as a logistics institute, a specialized IT institute, or a specialized institute dealing in life sciences should anchor the park. Institutes can assist in the commercialization of technologies.
- **Bonded warehouse facilities:** Facilities should be near cargo facilities.
- **Just-in-time manufacturing park:** The park should originate from R&D commercialization efforts by local universities. This could catalyze future opportunities in this area.
- **Freight-forwarders corridor:** The corridor should be near cargo and bonded warehouse buildings and distribution warehouses.
- **Flex industrial/warehouse park:** This would consist of smaller buildings.
- **Sport-themed parks:** These parks can take advantage of the sports heritage of the three universities and be located adjacent to the park and lakes.

Enhancing the Image of Airports

Unlike airports built today, traditional American airports were built much more sporadically to meet an immediate need or demand. As such, inconsistent land uses for airports often poorly reflect the image of a host city. Today, airports are perceived by the cities in which they reside as their major gateways. RDU, which is owned by multiple jurisdictions, is in a position to reflect the positive images of a dynamic region.

The panelists recommend the following strategies to promote a positive image of RDU regionally, nationally, and internationally:

- **Smart-airport concepts:** IT and technology of the future should be incorporated through the use of robots and sophisticated IT to manage the movement of vehicles and parking spaces as well as the delivery of services, and

to constantly improve the experience of passengers from the point they arrive to when they depart from airports.

■ **Airport aesthetics:** RDU has done an outstanding job in keeping the visible areas aesthetically pleasing. Terminal I is expected to receive Leadership in Energy and Environmental Design (LEED) certification. A mix of green building design, noise-control technologies, and smart technologies (such as smart meters on parking lots, up-to-date information on the next shuttle bus, etc.) should continue to be incorporated into all new developments. The planting of trees and shrubs can enhance the beauty of airport land while also helping to mitigate noises and air pollution.

■ **High development standards:** High development standards should be created for new developments. In most visible areas, that means control measures to standardize heights, building materials, colors, design parameters, and open-space treatments. Fewer control measures can be adopted in less desirable locations to ease the marketability of the sites.

■ **New trail systems:** Developing new trails will better connect and serve all major jurisdictions in the surrounding area.

■ **Recycling and renewables:** Better practices for waste management at the airport could help set a standard of best practices that could simultaneously provide alternative energy sources.

■ **Better connections to regional transit:** Better regional connectivity means improved access to local and regional destinations for visitors as well as a decreased carbon footprint and will help weave together the economic strength inherent in the region.

The airport's current development standard is to be applauded—from inside the terminal to the landscaping along the airport's roadways. A high development standard is essential to garnering status as a "world-class" airport, and should be at the heart of any new project the airport undertakes.



Planning and Design Concepts

RDU IS IN A POSITION to both catalyze and promote regional land use strategies by way of future development. If the airport is to truly be “world-class,” it must serve the surrounding region through a leadership role in transportation, planning, and development.

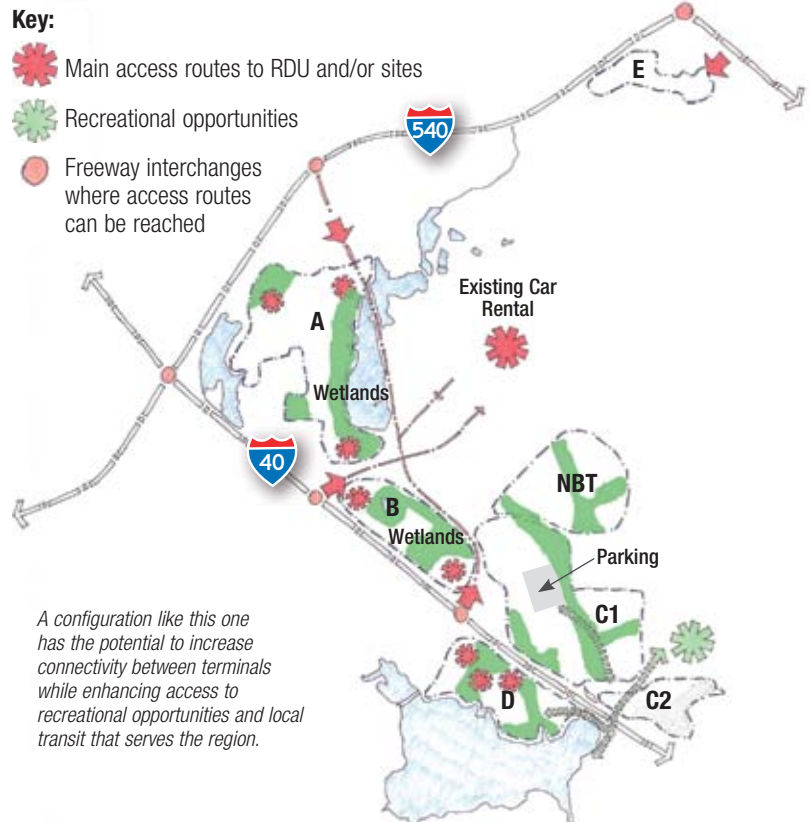
Regional Transportation

Metropolitan areas with transportation mode choices usually fare better in the long run than those without. The Triangle region is highly dependent on the automobile as the main mode of transportation, and the airport currently benefits from this situation with exceptionally high proceeds from airport parking. Regional approaches to add significant transit resulted in a regional bus-transit operation that provides transit access to the airport from both the Raleigh and Durham areas. A light-rail project between Chapel Hill and Durham is in advanced planning stages, while a commuter-rail project between Raleigh and Durham is on hold and currently being redefined. Options other than use of the North Carolina Railroad alignment with commuter diesel units may be considered, which may or may not open up the possibility that the airport could have a direct connection without the need for transfer. Such an option would appear plausible for bus rapid transit as the mode.

Should commuter rail remain the planned mode of choice, the airport would need a connecting shuttle system that could consist of rubber-tire buses, mini-pods such as those now used by Heathrow Airport, or any number of automated guideway systems. The panel recommends that an alignment for transit be planned and that space be set aside for direct access to the terminals, thereby continuing RDU’s successful principle of short and direct connections between all major core functions that air travelers need.

Most stakeholders interviewed by the panel cited access to the airport and lack of transit as key issues. The issue of transit access will appear in a new light when significant use diversification occurs, as is suggested in this report in response to the disposition of excess RDU property through lease and development options. Transit access to the airport is a relevant perception issue even if the actual number of air travelers using transit may be too low to justify a system. Airports with rail transit access often have significant use by employees of the airport and its other uses. Regarding the dependence on rather higher-income percentages generated from parking and rental cars, caution is advisable

Creating Connections to Site Development Opportunities



Consolidated Car Rental

Inside the core, significant development opportunities exist if consolidation of the rental car facilities and higher use of the remaining surface parking lots are considered. However, instead of moving the rental car facilities away from the core, thereby adding time needed for travel to and from the terminal, the panel suggests using the older low parking decks in front of terminal 2 as the staging areas for rental cars and moving certain functions (maintenance of cars, repairs, washing) off site either in the core (most efficient) or nearby outparcels. In this scenario, the existing parking decks would either be simply refurbished or demolished and rebuilt, depending on the structural conditions and the need for additional floors above the

current deck level. By consolidating car rental in the parking structure, air travelers can walk to and from their pick-up/drop-off points from and to the terminal, eliminating the cost for shuttle buses. Use of the parking decks allows instant relocation of rental operations and frees up the current parcels without compromising operations during construction.

As the parcel concept below shows, six development parcels could be created at Cedar Fork Drive, Rental Car Drive, Trade Drive, and Run Drive, with an underground connection under the taxiway. These parcels could be the base for a city block–type development concept with a development area of about 2 million square feet. Assuming an average of cost-effective five-story buildings (wood frame over a concrete deck) and 50 percent lot coverage, this would represent about 5 million square feet of gross development area (floor/area ratio: 2.5).



In contrast to current parking infrastructure (left), a reconfiguration of consolidated parking (below) creates potential for new development opportunities while also enhancing connectivity and access.



because of apparent changes in transportation behavior and technology. Although it is too early to predict whether these are sustained trends, car travel in the United States has diminished in recent years, transit use has increased, car sharing has gained popularity, and walkable communities score high in customer preferences. The technological advances in automobile automation (self-driving cars) may result in added roadway capacity from higher-use density but reduced demand for longer-term parking.

Site-Specific Opportunities

The panel identified a number of sites that offer opportunities within the study area. These sites include areas both within the core as well as outparcels outside the airport fence. Approached with appropriate sequencing and high standards, these sites stand to benefit not only the airport, but also the surrounding area. The illustration below highlights the key design elements and designated uses for new development as recommended by the panel.

The Core

The panel identified “the core” as a term to encompass the portion of the study area “inside the fence.” When the sequence of developing underused land is being considered, upfront investments for access infrastructure, grading, and utilities should receive special attention. By beginning development in underused core areas where infrastructure, access roads, and grading are already in place, upfront investment risk can be minimized and revenue from those early developments could generate the resources needed to fund the infrastructure on subsequent parcels outside the core.

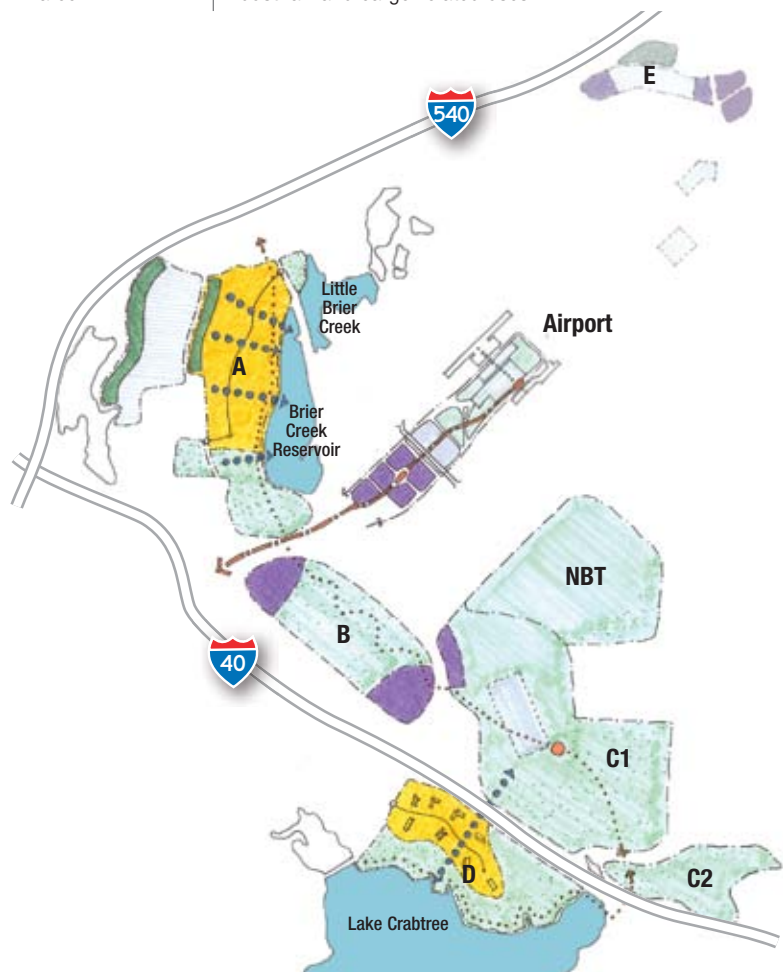
RDU has already identified additional development opportunities for cargo-related activities in the area north of the terminal contiguous with existing cargo operations as seen in the illustration on page 29 (parcel uses). With some consolidation of ancillary uses in this area, the cargo need of 50 acres identified elsewhere in this report could be met.

Outparcels

With only about 1,500 acres within the fenced core area of the airport, the 4,900-acre total RDU property represents significant opportunities for additional development. The

Suggested Uses for Outparcels A–E

Outparcels A–E	Suggested uses
Parcel A	High-performance development on lakefront visible from runway and terminal (office, hospitality).
Parcel B	No use suggested. The panel recommends that the potential use be determined after the proposed master developer conducts an in-depth market study and analysis. The panel recommends that this may be a high-potential-value site depending upon future runway reservation issues.
Parcel C2 (South)	A variety of uses including surface parking, trailhead parking, and active recreation.
Parcel C1 (North)	Restricted-access training facility associated with maintenance facility. The uses could include training building, driving course, burn structure, and the like.
Parcel D	Partly restricted, high-performance development (office, hospitality) set back from the lakefront with direct access to waterfront park.
Parcel E	Industrial- and cargo-related uses.



outparcels were previously analyzed for their development potential. Although they represent significant land areas, most of sites A–E are heavily affected by wetlands, streams, creeks, and access issues. Several parcels sit in highly attractive settings adjacent to lakes or large contiguous woods related to Umstead Park. Even in light of those restricted areas, the remaining developable lands are huge, and their actual development would shift the balance of undeveloped land in the region. Development of airport lands is challenging for a number of reasons, in part because they cannot easily be sold and in part because most parcels lack infrastructure. Overall, access of airport property is fantastic with three full interstate interchanges, but additional access roadways would be needed, especially inside the parcels.

The panel's illustrations of possible development strategies and concepts are based on use of existing roadways to the greatest extent possible and attempt to show how the existing landforms, wetlands, and conditions of the areas can be turned from liabilities into assets. In a comprehensive sustainability approach, the panel suggests working with the land and not against it, as a cost-saving and value-creation strategy. Keeping forest stands, topography, and streams or wetlands intact by minimizing clear-cutting and grading will make RDU a steward of the land and minimize environmental impacts on adjacent protected lands that are major regional assets.

If RDU is branded as a convenient, customer-friendly, innovative airport, all investment strategies need to flow from that brand, including real estate development and environmental stewardship. Given the significant wetlands, lakes, and streams, best management practices for stormwater are important for the regional quality of life major attractions in the vicinity such as Crabtree Lake and Umstead Park. Such best practices may become bargaining chips in negotiations about lot-line adjustments on the eastern edge of the RDU property or in negotiating use of certain limited wetland areas to make some developments work better.

A comprehensive water management plan may include reuse of stormwater for irrigation and could result in savings

over time that more than offset initial investments. The same may apply for a comprehensive energy plan optimizing energy throughout all RDU facilities and the suggested new developments. Such a comprehensive approach would fall under the rubric of “smart airport” and “innovation airport” and further solidify the Triangle region's reputation as a leader in technology and innovation. Such a symbiotic relationship also stands to bolster the airport's image as a source of innovation and leadership within the region.

Setting High Development Standards

High standards of design, environmental stewardship, innovation, and sustainability are value-creation strategies that offer a return on the investment over time. With the airport as the owner of the land and the developments being leased to others, such long-term strategies make eminent sense because the initial investments can be recuperated by the owner.

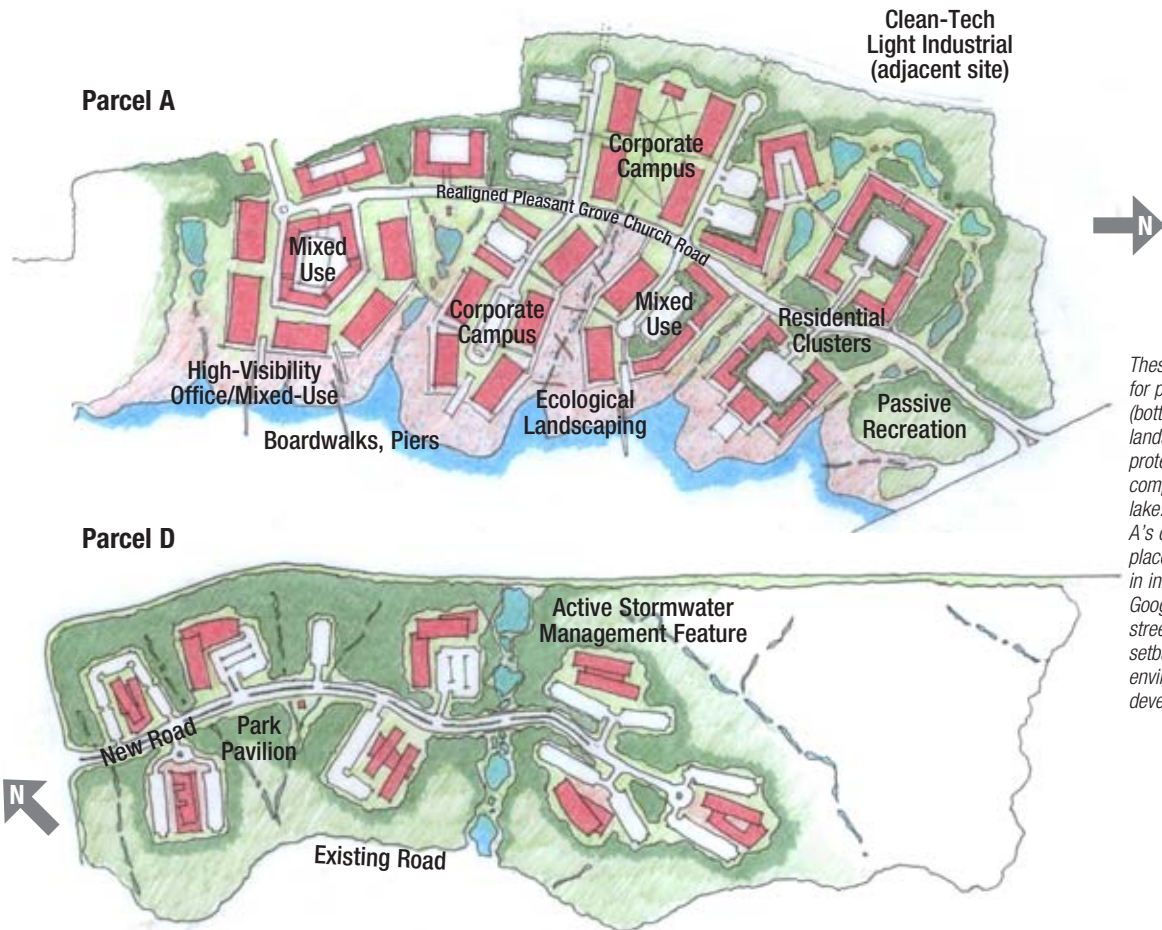
Design Sequencing and Strategy

The sponsor recognized in the presentation materials that diversification and monetization of land assets are not short-term fixes, and the panel agrees that real estate decisions should not be motivated by immediate financial gain, but that these assets need to be monetized with a long-range view based on recurring income streams. To this end, a patient approach that follows minimum development standards, careful sequencing, and determination and consideration of potential uses is of utmost importance.

One of the signature elements of good design and development is based on capitalizing on the opportunities the development sites represent. In a brief review of the available sites, ULI applied the following criteria in assessing sites' assets and liabilities: access, visibility, natural assets, and a general ability to develop from a grading and wetland perspective.

Based on those initial criteria, the panelists distinguished the sites as follows:

- Areas of restrictions based on wetlands and streams;



These potential designs for parcels A (top) and D (bottom) work with the natural landscapes to provide ecological protection and aesthetics that complement the adjacent lake. The clusters in parcel A's design create a "sense of place" that mirrors that seen in innovative campuses like Google's. Parcel D has a "green street" design that offers natural setbacks and buffers to maintain environmental integrity and high development standards.

- Areas of high-performance development based on visibility, access, and proximity to an attractive body of water (lake);
- Areas of industrial warehouse and cargo-related use (based on access); and
- Areas of other mixed uses.

A Continuation of Precedent: Shaping a World-Class Airport

RDU set a high bar for design with terminal 2. Ample development opportunities exist in the core area and on outparcels A–E.

Passenger Terminal World magazine, an aviation publication, has named Fentress Architects–designed RDU “the world’s best” in the category of “Notable Regional Airport Development.” Maintaining high design standards will be important, especially on the additional parcels.

Early development will signal what is expected and will establish a precedent for subsequent development. Economically, the long-term revenue stream from leases

will depend on the quality and design of what has been created. Design and development standards can ensure that expected values are achieved. The standards should vary according to the location on the RDU campus and the locational advantages a specific site offers. Proposed uses and building designs should respond to and capitalize on those advantages. Inappropriate uses in high-value locations—such as a warehouse facility along a lakefront—will not create extra value. Design and synergy between the development parcels play a major role in creating value. Each subsequent development must exceed the development standards of the last, allowing higher investments to get future parcels to be development-ready.

An existing example of land use that is inconsistent with the image RDU should be striving for is the Sheetz gas station at the gateway point into the airport. Although it fulfills a need and is useful to air travelers and rental car users, it does not conform to development standards that would support airport branding. Development standards would force chains and contractors to comply with design and architecture standards set by RDU and not by their respective corporate branding.

Development and Implementation Strategies

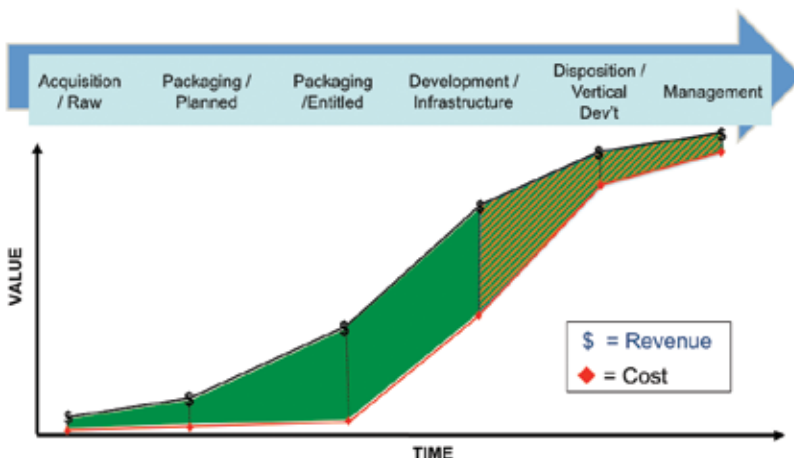
TO REALIZE THE HIGHEST RETURNS and best results from monetizing its non-aeronautical assets, RDU needs to think and behave as a real estate developer. Given the size and scope of these assets, this effort more specifically mandates adopting a strategic framework and operational structure that embraces a role as the master land developer for all real property holdings and the entirety of 4,929 acres. To accomplish this transformation into the master-developer role, RDU should adopt a targeted development approach and strategy that achieve one overarching goal: to create shovel-ready sites so that RDU is positioned with the framework and capacity to be proactive and take advantage of all opportunities that arise.

Development Approach

This master-developer role entails rethinking and redefining RDU's vision and objectives vis-à-vis non-aeronautical endeavors. Furthermore, the aeronautical core of the airport should be placed under the same microscope and analytical review as the land parcels that ring the perimeter of the airport property. This will require advance

As the chart below shows, a master-developer role offers immense economic benefits over time when carried out properly.

Development Value by Role



Source: HR&A Advisors Inc.

due diligence and land use planning on both existing built assets and yet-to-be-built locations.

A coordinated approach requires that RDU carefully consider and establish the scope of its development role in light of the potential execution strategies needed to complete successful transactions and ensure the desired revenue and income streams down the road.

Two key components of the new development approach and strategy include the need for RDU to recalibrate its communications efforts and more fully engage local and regional partners. The panelists' interviews made clear that RDU has not been entirely effective with communicating its role and needs with businesses, government, and the wider community. How and to whom RDU presents and tells its "story" is very important to a successful long-term effort.

By consistently managing and executing its role as a master developer, RDU will be able to successfully and profitably build the capacity to create shovel-ready sites and generate expanded and new sources of income in a timely fashion.

Vision and Objectives

The transition into a master-developer role includes redefining the vision and objectives for achieving revenue and returns from real property assets. Thus, RDU needs to create a clear vision for resource and property development that is defined in a positive relationship to aeronautical assets. This means understanding and positioning real estate in a shared (not just a supporting) role in the overall RDU asset portfolio.

It also requires clarity about the risks and rewards of real estate transactions—a very different set of assumptions

than those required for the maintenance and operation of the 38th-largest airport in the United States. The risk/reward profile is markedly more entrepreneurial and subject to a cyclical economic environment that is even more exacerbated than the typical trough-to-peak-to-trough pattern seen in the general real estate economy.

Much real estate development (especially previously unbuilt land) requires substantial infrastructure planning and development. The temptation will exist to provide incentives or subsidies to future prospects and partners. However, RDU must avoid these inducements to create a level playing field between private and public sector opportunities. This will ensure broad-based support and participation by the real estate community and also ensure greater participation by all in the solicitation, request for proposals, and deal process.

Underlying this transition to a master-developer role is the need to adhere to the key principles that foster successful public/private partnerships. These principles include the need to

- Prepare properly for RDU's role in future public/private partnerships;
- Create a shared vision;
- Understand the partners and key players;
- Be clear on the risks and rewards for all parties;
- Establish a clear and rational decision-making process;
- Make sure that all parties do their homework;
- Secure consistent and coordinated leadership;
- Communicate early and often;
- Negotiate a fair deal structure; and
- Build trust as a core value.

Master-Developer Role and Predevelopment Tasks

The master-developer role encompasses a wide range of responsibilities and is often defined differently depending on the nature of the real estate asset. Real estate developers are especially adept at managing all aspects of the development process, including the acquisition, planning, zoning, design, financing, permitting, construction, project management, marketing (such as sales and leasing), and asset and operations management. These responsibilities apply to the development of all building types.

However, with land assets, the role is defined more narrowly. The master developer focuses on acquisition; enhancing the property (land packaging); where appropriate, constructing the horizontal infrastructure (land development); and disposition for vertical construction (of the buildings) by others.

Because RDU already controls the site, the focus is on creating a concept plan that identifies the highest-value short-term and long-term uses; establishes the desired framework for proceeding with that plan; creates the shovel-ready sites and targeted development opportunities; and oversees the implementation of the plan through the offering/disposition process and selection of joint venture and individual project partners. These responsibilities are covered by "predevelopment tasks" that are performed by the RDU team and/or its development consultants. The tasks generally include the following:

- **Physical and site capacity studies:** Given the nature of the airport property, these would also both be on-site and off-site studies of transportation alignments and open space strategy.
- **Environmental investigations:** These can include air, water, and ground studies.
- **Geotechnical studies:** Studies can include geologic and soil assessments.

- **Market studies and marketability assessments:** Examples of such studies include property analysis; economic and demographic analyses; and concept/development program evaluation and use recommendations.
- **“Zoning” and permitted/allowable uses:** These tools allow for optimal development in line with the airport’s long-term strategy and standards.
- **Preliminary concept plans and designs:** These are provided by architects, land planners, and affiliated design and engineering professionals.
- **Infrastructure planning and cost estimates:** This is an evaluation of the anticipated cost of the concept/development program, targeted parcel/lot properties, and individual sites.
- **Financial analyses and feasibility studies:** Such studies typically use the specific development recommendations determined in a marketability analysis for the proposed sites and project initiatives to determine concept feasibility and underwriting assumptions.

Development Strategy and Playbook

With the exception of the aeronautical core, RDU’s real property assets consist of substantial landholdings. As such, the authority needs to create a strategy that focuses on the paper enhancements of land packaging—and, where appropriate, the limited and necessary construction of horizontal infrastructure of land development—to facilitate the disposition and ultimate development of the properties.

This can be accomplished by assembling a playbook that evaluates the relative revenue and return opportunities for all five major land parcels. This evaluation process can then drill down even further to the potential individual sites within the land parcels that are identified through a next-level run-through of the predevelopment tasks previously noted.

The RDU playbook should emphasize the land-packaging role in preparing assets for shovel-ready status. This is quite distinct from site-ready status that requires the construction (and use of the “shovel”) of some, if not all,

of the horizontal infrastructure. The panel recognizes that in some instances new roads and utilities are needed to access and prepare the parcels for disposition and ultimate development by builders and joint venture partners. However, RDU’s master-developer role is best served by executing as much of the predevelopment playbook as possible without placing the shovel in the ground.

That, in turn, allows RDU to properly position itself and manage the request-for-proposals process with parcel and site development; seek the highest and best use of the properties; and structure transactions that maximize revenues and investment returns.

The playbook is essentially a roadmap for decision making that at a minimum requires performing the predevelopment tasks. Thus, first and foremost, the master developer must assemble the necessary resources and a project team. Whether internal to RDU or external and hired on a project-by-project basis, the team should comprise land planners, architects, engineers, cost estimators, market analysts, feasibility experts, legal advisers, and development professionals.

Thinking Big

Keeping the big picture in mind at all times is critical. In other words, the real estate goals and objectives need to address RDU’s vision and mission. So while careful consideration should be given to smaller site and parcel transactions, RDU needs to ensure that those designated uses and lease deals are appropriate to the overall master development plan.

Communication Efforts

Market positioning and associated market awareness efforts are an important part of the master-planning and development process. From the beginning through completion and beyond, RDU needs to promote the brand and development story as a benefit that creates jobs and high-value employment and also results in a multiplier effort that reinforces nearby, adjacent, and regional economic development. The panel’s interviews make apparent that RDU has not been wholly successful, given stakehold-

ers' lack of understanding of RDU's mission, goals, and real property holdings. As such, RDU needs to recalibrate its communication efforts in both the near and longer terms so that the authority's larger vision and mission—along with this master-planning process—continues to be welcomed and embraced by the community.

Key Partners and Stakeholders

As RDU evaluates its communication and marketing efforts, proper identification of and engagement with the key

partners and stakeholders becomes increasingly important. Because the airport benefits directly from a growing economy, it should actively partner with those entities that will grow the economy, such as the following:

- **Tenants at RDU**—with the recognition of the need for regularly scheduled meetings with tenant leaders as well as key operational personnel;
- **Customers at RDU**—including both business and leisure travelers;

Playbook Guidelines

The playbook should include guidelines for evaluating RDU's goals and objectives. For example, this can be done with templates that might include the following:

- **Land lease formula:** Development return expectations are based on a target yield for investments and cash flows. Using the financial feasibility analyses, RDU can calculate the likely revenues for parcel and site transactions. Historic market rates of return for ground leases have ranged between 5 and 7 percent. More recently, rates have been in the 8 percent to 10 percent range. Over a long-term agreement such as the 40-year period permitted by RDU's statutory authority, step increases can be included as part of any proposed deal. Though the specific terms of each transaction will vary, this formula will provide the foundation for negotiating revenues and projecting income.
- **Schedule/timeline formula:** Because parcel and site delivery will be shovel-ready, RDU can project the timeline for investment and development at the completion of each transaction, which in turn will enable the authority to determine a likely schedule for the overall property development and revenues. This forecast can play an important role in evaluating future non-aeronautical income and assist in the general airport operations and management.
- **Jobs-generated formula:** Given the importance of regional economic development, RDU can assess the potential new employment from each parcel and site opportunity based on the expected tenancy by target industries and employers. Using this metric, the authority can evaluate the relative merits of various development and transaction scenarios—thus achieving revenue objectives and simultaneously furthering economic development and public relations.

- **Return guidelines:** This metric has two uses: it evaluates the cost-benefit analysis of horizontal infrastructure improvements that might be needed to deliver parcels and sites, and it provides a tool to assess the benefit of future land or property acquisition that might be appropriate to enhance the mission and revenue stream of the authority.
- **Capital fundraising guidelines:** These guidelines are used to understand potential investments by the authority if horizontal infrastructure is recommended; evaluate government and agency funding opportunities to finance and support such capital expenditures; and evaluate the absolute and relative investment with equity and debt by joint venture partners, builders, and businesses with transactions (which would rank the commitment and risk being assumed).
- **Execution guidelines:** In anticipation of disposition and transaction efforts, the authority needs to establish the parameters for three items: funding for possible infrastructure and land development expenses, procedures for expedited approvals and transfers, and rules for conveyance strategies.

With the focus on shovel-ready parcels and sites, continually checking existing local, regional, and state programs is imperative. Such programs are designed to assist private and public sector developers with various incentives, financing, and infrastructure improvements. The playbook should incorporate this activity and search for criteria on a continuing basis to ensure that RDU stands prepared and ready to compete with solicitations and requests for proposals from major users and employers as well as individual business and building opportunities.

- **Business community at large**—with special emphasis on major corporations and enterprises;
- **Adjacent property owners**—and nearby neighborhood associations;
- **Umstead State Park**—and its affiliated supporting and sponsor organizations;
- **Surrounding jurisdictions**—adjacent municipalities in addition to the cities of Raleigh and Durham, and Wake and Durham counties;
- **Research Triangle Park**;
- **Relevant government organizations and nongovernmental organizations**—such as Triangle J Council of Governments and others and the Research Triangle Regional Partnership;
- **Economic development organizations and area chambers of commerce**—such as Wake County Economic Development, Orange County Economic Development, Durham Economic Development Commission, Greater Durham Chamber of Commerce, and Greater Raleigh Chamber of Commerce;
- **Educational institutions**—such as the University of North Carolina at Chapel Hill, Duke University, North Carolina State University, North Carolina Central University, Durham Technical Community College, and Wake Technical Community College; and
- **Transit partners**—such as Triangle Transit Authority, Capital Area Metropolitan Planning Organization, and Durham–Chapel Hill–Carrboro Metropolitan Planning Organization.



As part of a process to wholly consider community needs beyond the airport fence, the panel visited a number of local and regional sites, including nearby Lake Crabtree (pictured above).

Conclusion

RALEIGH-DURHAM INTERNATIONAL AIRPORT finds itself in a unique and favorable position compared with many similar-sized airports across the country. The airport is to be commended for its ability to simultaneously operate and enhance what is truly a remarkable, high-quality airport. This is no easy feat.

Going forward, RDU must remain diligent in its efforts to improve the quality of development that occurs around the airport, while also strengthening its organizational capacity so as to be a “neutral leader” that fosters community engagement and catalyzes growth. Proper care with investment decisions, along with increased collaboration with stakeholders across county lines, will allow RDU to be not only a community growth engine, but also a symbol of the Triangle’s innovative spirit.

Positioned carefully, RDU promises to achieve status as a world-class airport that complements the region and attracts visitors from around the globe.



Together, the pictures at left symbolize a successful development approach—a balancing act that requires partner engagement, a shared vision, and trust as well as strong and coordinated leadership. If RDU is to be successful in a master-developer role, it must be the neutral ground where ideas and people meet.

About the Panel

John M. Walsh III

*Panel Chair
Dallas, Texas*

Walsh is the president and founder of TIG Real Estate Services Inc. TIG has developed or redeveloped more than 2.5 million square feet of office and industrial buildings. The company manages and leases a portfolio of almost 10 million square feet of office, industrial, and retail buildings on behalf of its institutional clients in four states. Prior to starting TIG, Walsh spent 17 years with Trammell Crow Company in various leasing, development, and senior management roles. During his tenure as development partner for the northwest Dallas area market at Trammell Crow, he was involved in the development of almost 5 million square feet, including leasing over 8 million square feet of office, industrial, and service center space.

A Dallas native, Walsh has served as chairman, director, and trustee of various business and charitable organizations. He has also served on working committees and boards for the city of Carrollton, the city of University Park, Highland Park Independent School District, and the city of Farmers Branch.

Walsh was an instructor at Brookhaven College for ten years and at the University of Texas at Arlington for two years, teaching business law to undergraduate students. At present, he is a graduate school visiting instructor at the University of Texas at Arlington School of Architecture.

Walsh has been a member of the executive committee of the Vision North Texas initiative since its inception in 2004, where he has been involved in numerous activities as a speaker, sponsor, and participant. He currently serves as a member of the Management Committee of North Texas 2050.

A leader and active participant in the Urban Land Institute, Walsh has served as a volunteer member of numerous ULI Advisory Services panels. He has participated as a speaker and presenter for ULI at the national, regional, and local levels. Walsh has acted as a product council chair at ULI, a council counselor, and vice chair of programs, and he is currently the treasurer of ULI North Texas and recently completed 4.5 years as its chair.

Walsh has made presentations to numerous real estate–related organizations throughout the country on such topics as underwriting, development techniques, financing obstacles and opportunities, marketing strategies, legal challenges, contracts, transactions, community development standards, and real estate evaluation.

A member of the Texas State Bar since 1978, Walsh earned a law degree from Texas Tech University School of Law. His BS is from the University of Texas at Arlington.

Mulugetta Birru

Pittsburgh, Pennsylvania

Birru is acting president and CEO of MGB & Associates LLC. MGB is a full-service consulting firm focusing on real estate and economic development. Clients include Michigan's Wayne County and McCormack Baron Salazar.

From July 2004 through December 2008, Birru served as CEO of the newly formed Greater Wayne Economic Development Corporation and director of the Department of Economic Development for Wayne County. His responsibilities included development of Pinnacle Aero Park near Metro Airport and the introduction of the much-acclaimed Aerotropolis/Airport City project. He initiated the Wayne County China Program and was involved in business attraction and retention.

Between July 1992 and July 2004, Birru served as the executive director of the Pittsburgh Urban Redevelopment Authority, and during this period he also assumed dual responsibility as director of the Allegheny County Economic Development Department. Birru spearheaded over \$4 billion worth of projects, including the development of the stadium for the Steelers football team; the ballpark for the Pirates baseball team; a brand-new convention center; development around the airport; redevelopment of more than 1,000 acres of former steel mill sites into high-tech parks and corporate and regional headquarters; and other mixed-use developments. He initiated business partnerships with Chinese and Japanese cities for both the city of Pittsburgh and Allegheny County.

In addition, Birru taught graduate courses at the Heinz School of Public Policy at Carnegie Mellon University for more than ten years.

In his native Ethiopia, Birru has served as CEO of the National Chemicals Corporation, deputy CEO of National Beverages Corporation, senior vice president of the Agricultural and Industrial Investment Bank.

Birru holds a BA in business administration from Addis Ababa University; an MA in economics and an MBA in finance, both from Syracuse University; and a PhD in public and international affairs with a focus in development economics from the University of Pittsburgh.

Kate Collignon

New York, New York

Collignon has 15 years of private and public sector experience in economic development, real estate, and urban planning, with an emphasis on downtown and waterfront revitalization. She works with public, institutional, and

private sector clients nationwide to advise on master plan creation, craft public/private partnerships, and manage complex projects. In addition to her contributions on projects, she oversees the growth and operations of HR&A's New York City headquarters.

Collignon provides economic strategies to underpin master plans and negotiates the partnerships necessary for implementation. She served as project manager for several of HR&A's master-planning efforts, including a strategic growth and modernization plan for the Research Triangle Park in North Carolina; an award-winning master plan for a seven-mile stretch of waterfront on the Delaware River in Philadelphia; a sustainable plan for Union Pier in Charleston, South Carolina; and an industrial revitalization strategy for the district surrounding Philadelphia's Lower Schuylkill River. She provided project management and strategic real estate advisory services for complex private development initiatives in New York City, including a new stadium for Major League Soccer and a proposed indoor cycling and recreation center.

She also supports HR&A's public policy and open-space planning practices. She examined the vast number of publicly owned, underused parcels on behalf of Detroit Works and assessed current and best practices for regulating and promoting construction site safety on behalf of the Building Trades Employers Association of New York City. Collignon supports governance and operations planning for new open space proposed for the Seattle Central Waterfront and is formulating a funding and governance strategy for Gateway Park in Oakland, California. Currently, Collignon is managing the creation of a real estate and asset management strategy for the Menil Foundation in Houston; negotiating a public/private development agreement for the Horizon District in Charleston; and generating an innova-

tion campus master plan for University of Pennsylvania's South Bank site in Philadelphia.

Before joining HR&A, Collignon served as a development director with Brookfield Properties, where she managed predevelopment for commercial and mixed-use projects across the United States. Previously, she worked with the New York City Economic Development Corporation, where she served as senior vice president for development and was in charge of large-scale planning and development initiatives such as plans for Manhattan's 125th Street, downtown Brooklyn, Coney Island, the Brooklyn waterfront, and Brooklyn Bridge Park. Her projects integrated real estate, infrastructure, and capital planning in connection with commercial, residential, industrial, and open space uses.

Collignon is a graduate of Columbia University and holds a master's degree in public policy and urban planning from the Kennedy School of Government at Harvard University.

Rob Dower

Pittsburgh, Pennsylvania

Skilled at designing and depicting spatial concepts, Dower is a valuable addition to any project team. His abilities and experience allow him to comprehend design objectives with ease and visualize solutions through drawings and graphic presentations. He leads innovation in building information modeling at Strada.

Dower received a bachelor of architecture, a master of architecture, and a graduate certificate in urban design from Kent State University. He served as a studio professor there for undergraduate courses during his graduate studies. To broaden his perspective on urban planning, Dower spent four months researching urban design strategies in various European cities. He later worked at several Ohio-based design firms and nonprofit organizations that specialized in urban design and architecture.

Since joining Strada, Dower's keen eye and graphic skill have strengthened a number of projects, including the law school addition at West Virginia University and the Bakery

Square 2.0 Master Plan. Recently, he has been immersed in building design and construction administration for two new construction projects in Pittsburgh: North Shore Place, an urban retail development, and Bakery Living, a multiunit residential project.

April Anderson Lamoureux

Milton, Massachusetts

Anderson Lamoureux has nearly 20 years of experience forging productive relationships between business and government. She has held senior economic development positions within the administrations of Massachusetts governors Deval Patrick and Mitt Romney; served as the Pioneer Institute's director of public affairs and director of the Center for Urban Entrepreneurship; and served as chief of staff, research director, and legislative director in the Massachusetts Senate and House of Representatives.

She has spent her career working to increase the effectiveness and efficiency of government and to assist businesses to successfully manage their interactions with the public sector. She has extensive experience navigating federal, state, and local government regulations, with particular expertise in land use and development, and she specializes in economic development strategy, infrastructure financing tools, permit streamlining, public/private partnerships, and government relations. Among her many accomplishments while in state government, Anderson Lamoureux created and implemented the state's first comprehensive regulatory reform agenda that eliminated or streamlined hundreds of state regulations across all secretariats of the Patrick administration, and she created and implemented the Chapter 43D Expedited Local Permitting Program, enabling six-month local permitting in more than 80 cities and towns in Massachusetts. She also created and implemented the MassWorks Infrastructure Program, a \$350 million infrastructure grant program to support housing and economic development projects, and she oversaw the successful deployment of the \$556 million American Recovery and Reinvestment Act Recovery

Zone Bond Program, including private activity bonds and municipal infrastructure bonds.

She was a 2013 judge for the nationally recognized Pioneer Institute Better Government Competition and serves as a panelist for the Urban Land Institute's Advisory Services program. Anderson Lamoureux sits on the Massachusetts Development Finance Agency board of directors, Real Estate Committee, and Manufacturing and Defense Committee. She is also a member of the board of directors for Leading Cities, a global economic development network, and the board of directors for Fuller Village, an independent-living retirement community in Massachusetts. She is a member of the Urban Land Institute and the National Association of Industrial Office Properties.

A resident of Milton, Massachusetts, Anderson Lamoureux holds a bachelor's degree in political science from the University of Massachusetts.

Klaus Philipsen

Baltimore, Maryland

Philipsen is president of ArchPlan Inc., an architecture firm in downtown Baltimore specializing in community revitalization, building rehabilitation and adaptive use, historic preservation, and transportation planning since 1992. He was named a fellow of the American Institute of Architects (AIA) in 2011 for being an example of what it means to be a citizen architect and using his professional skills over the course of his entire career to affect communities through advocacy for urban revitalization, public transportation, and managed growth. His actions have shaped Maryland's nationally recognized smart growth policies, influenced the renaissance of Baltimore, and inspired young people to become citizen architects themselves.

As president of his architecture firm, Philipsen works on major transportation projects such as the \$2.5 billion Baltimore Red Line, a planned surface-subway light-rail line, and a large bus transit center in Langley Park, Maryland, and is the architect of record for a catalytic urban infill project composed of a restaurant and museum complex

on Baltimore's Pennsylvania Avenue, the former hub of African American culture in Baltimore. His small firm has completed many large and award-winning urban planning, housing, and commercial and reservation projects.

In addition, Philipsen is involved with several influential organizations and has worked in many advisory functions, such as on the board of directors and as cofounder of 1,000 Friends of Maryland, a statewide growth management group; vice president of NeighborSpace, a Baltimore County urban land trust; president of the board and cofounder of D center, a nonprofit design center in Baltimore devoted to design as a problem-solving tool; cochair of the Urban Design Committee of AIA Baltimore since 1995; member of the national Regional and Urban Design Committee of AIA appointed by the president of AIA National; past member of the Baltimore County Design Review Panel; past member of the Maryland Growth Commission, Subcommittee on Planning Techniques; past member of a blue-ribbon panel to study transit-oriented development in Maryland under then transportation secretary John Porcari (2000); and a ten-year member of a borough council in Stuttgart-Bad Cannstatt (1976–1986).

Philipsen received a master's degree of architecture in Stuttgart, Germany, in 1975. He has also worked as an architect and a planner in Stuttgart and London and has resided in the United States since 1986. He has taught architecture and urban design as adjunct faculty at the University of Maryland and at Morgan State University. He has been an associate member of ULI for many years.

Mark Troen

Warwick, New York

With 30 years' experience in investment banking, development companies, real estate firms, institutions, and corporations, Troen has worked on \$10 billion in transactions with high-level returns on high-risk, turnaround, and problem assets. He has sourced, negotiated, conceived, analyzed, planned, entitled, developed, completed, and restructured mixed-use, retail, office, industrial, and residential projects nationwide and internationally, ranging in

size from \$5 million to \$1 billion and up to 1 million square feet and 3,000 acres.

At present, he focuses on specific asset and portfolio strategies including opportunistic situations; subperforming and nonperforming loans; distressed, undercapitalized, and bankrupt assets; environmentally challenged and compromised properties, litigation, partnership issues, and management disputes.

Troen has an extensive history in the real estate workout and restructuring field, beginning his career at Security Pacific Realty Advisory Services, where he created innovative financial and transaction strategies for troubled assets and opportunistic situations while directing multidisciplinary teams in land development and building projects nationwide. Subsequently, at the height of the last real estate depression (1991–1995), he joined the Asset Management and Special Situations Group at HSBC USA (Marine Midland Bank), where he successfully acquired and disposed of foreclosed assets throughout the Northeast, Mid-Atlantic, and Southeast. He maximized returns and created profits on a \$1 billion portfolio far above and beyond book value recovery.

At the Weitzman Group, Troen created the Development Advisory Services practice for mixed-use, commercial, residential, and land properties. In the process, he transformed and rebranded a highly regarded real estate feasibility firm into a comprehensive real estate services provider.

As chief development officer at Monday Properties, he developed new properties; redeveloped existing assets; marketed fee-generating services; revitalized a troubled loft conversion; planned signature developments; and sourced new acquisitions for a 7 million-square-foot New York and Washington, D.C., office, residential, and mixed-use portfolio.

Troen was a cofounder of Racebrook Capital Advisors (where he specialized in the acquisition of opportunistic real estate assets, nonperforming and subperforming loans, and distressed properties) and recently served as

the chief operating officer of Sheldon Good & Company (a Racebrook Portfolio Company), where he reinvigorated a 45-year-old nationwide real estate auction services firm; revamped legacy operations and restructured business development, marketing, and project management; and conducted more than 100 auctions, achieving \$375 million in closed real estate sales.

Troen has a multidisciplinary educational and professional background, with an MBA from the Wharton School and a master of architecture degree from the University of Pennsylvania. He graduated from Harvard College, AB cum laude, while majoring in economics.

Active with the Urban Land Institute, Troen is the chair emeritus of the Urban Development Mixed-Use Council Gold and has served on ULI Advisory Services panels in Chicago and Charlotte. He is a fellow of the Royal Institution of Chartered Surveyors; a Counselor of Real Estate with which he has served on Consulting Corps panels in Seattle and Boston; a member of the American Institute of Architects; and a registered architect. He holds real estate broker's licenses in New York, Connecticut, and Maryland.

A ULI Advisory Services Panel Report



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