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Megatrends:

The Potential Effect on Growth Patterns in Greater Washington

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Megatrends Executive Summary

The Potential Effect on Growth Patterns in Greater Washington

The question for the 2030 Group to consider is whether the projected economic future of the Washington area can be altered to achieve a structural capacity to accelerate its growth by building on its emerging comparative advantages. This paper outlines a set of vital issues, or megatrends, that will affect economies around the world, including the Greater Washington region.

Globalization

- Greater Washington's primary strength in the global economy is as a policy city. The region may become an even more attractive location for non-US organizations and businesses desiring proximity to policy-makers and thought leaders.
- Greater Washington's business network is considered less well-integrated into the global economy than either the region's policy network or the business networks in other cities. Key industries within the professional services sector in particular appear less well connected.
- Greater Washington has the location attributes to thrive in the global economy, including world-class talent, global awareness and cosmopolitanism, and strong international air service.

Demographics: Aging and Immigration

- Aging and immigration patterns will change the composition of the Greater Washington workforce by 2030.
- Greater Washington has an older population than its competitors but it also has a senior workforce that is more likely to keep working. To have access to a sufficient number of workers, employers will likely need to make accommodations to attract and keep seniors in the workforce.
- Greater Washington's immigrant population is larger, more established, more diverse, and more educated than the foreign-born in competitor cities. However, many newly arrived immigrants are younger and have less education than previous arrivals.

How We Work

- Alternate employment arrangements (such as use of independent contractors instead of employees) and flexible work arrangements (such as telework) will continue to change the distribution of work in Greater Washington over the coming years. These trends will affect demand for office space and use of transportation systems.
- Future differences among regions will likely lie in employer response to these trends. Regions with employers that offer flexible work arrangements may have some advantages in the competition for talent, especially among senior and Generation Y workers.
- Greater Washington's industry mix and demographic profile suggest that Washington area employers have and will continue to expand flexible work policies, perhaps at a faster rate than employers in other cities with different industry profiles. If so, research indicates that Greater Washington may have an advantage in retaining and attracting talent.

Energy and Environment

- Energy and environmental issues will change "business as usual" for the private and public sectors in Greater Washington through 2030. However, many policies are under development now, making the specific implications unclear.

- Reducing greenhouse gas emissions is expected to be a priority in Greater Washington, with impacts on power plant investment decisions, transportation choices, land use patterns, and energy use.
- Greater Washington communities will adopt adaptation strategies in response to expected rises in temperature and extreme weather that will affect land use, coastal developments, and metropolitan infrastructure planning.
- It seems likely that land use patterns will change to become more compact over time. Such changes are consistent with nearly all the energy and environment policy recommendations at all levels. If this occurs, it may create the capacity to include a greater percentage of the region's population and jobs within the boundaries of the Washington MSA.

1. Globalization
Executive Summary

- Greater Washington's primary strength in the global economy is as a policy city. This includes official government activities as well as international institutions, non-government organizations and think tanks.
- Greater Washington may become an even more attractive location for non-US organizations and businesses desiring proximity to policy decision-makers and the broad base of thought leaders in the region.
- Yet Greater Washington's business network is considered to be less well integrated into the global economy than either the region's policy networks or the business networks in other cities.
- The region's advanced professional services, which are expected to continue to drive Greater Washington economic growth, appear to be increasingly integrated into global networks, but not yet to the extent that they are in global cities like London, New York or Chicago.
- Greater Washington has the location attributes to connect and collaborate - and therefore thrive - in a globalized economy. These include:
    - Availability of and access to educated, skilled talent regardless of country of birth
    - Global awareness and education; cosmopolitanism
    - Physical infrastructure that allows connectivity, especially air transport and information/communications technologies

In response to these trends, 2030 Group strategies may include:

- Assess the region's international air transport assets to ensure that Greater Washington is optimally positioned to support greater passenger traffic and ties to more parts of the world over the next 20 years.
- Examine how Greater Washington's highly specialized advanced professional services participate in the global economy and determine steps that can strengthen their position.
- Support partners to expand their ability to attract global companies to Greater Washington.

1. Globalization

Globalization means "the increasing integration of economies and societies around the world, transcending the boundaries of the nation state." It encompasses trade, capital flows, the broad exchange of ideas and people, cultural and technology transfers, transnational regulations and political relationships.

Metropolitan centers are the primary actors for most aspects of globalization. Put another way, many of the elements of globalization listed above play out through the world's metropolitan areas. Many of the most important growth sectors in the global economy, such as finance and advanced professional services, are also concentrated in major metropolitan areas and their cities. In fact, it has been suggested that the economic networks that exist among various metropolitan centers are more important to understanding globalization than nation-to-nation linkages.

These activities and networks are important drivers of future growth for metropolitan areas. To succeed economically, metropolitan centers will not necessarily compete with other metropolitan centers, but they must connect and collaborate with them.

Metropolitan centers need certain attributes to connect and collaborate and therefore thrive in a globalized economy. These include:

- Availability of and access to educated, skilled talent regardless of country of birth
- Global awareness and education; cosmopolitanism
- Physical infrastructure that allows connectivity, especially air transport and information/communications technologies

Globalization can also bring new risks. The US remains the dominant political and economic actor in the world, but new regions and cities (in China and India, for example) are gaining in importance in the global economy. This will necessarily require adjustments to the existing global networks that will benefit some regions and individuals more than others. Inequality and/or poverty among those not connected to global economic networks may increase. Crime and terrorism also function differently in a globalized era.

Will these trends affect Greater Washington differently than other regions?

Yes. Washington plays a very different role in the world than other cities, especially other US cities. Its policy role dominates Washington's global connections, but its economic ties are significant and may be strengthening as well.

Washington as a Second Tier Global City

Greater Washington is firmly placed in the second tier among most studies of global cities. For example, the Globalization and World Cities Research Network describes Washington as a "beta" city; these are "important world cities that are instrumental in linking their region or state into the world economy," but that are *not* highly integrated into the global economy and do not link major regions in the world economy. In other words, Washington, for the most part, presents US interests to the world, but is not truly global in the way that New York and London are.

Many global cities studies tend to emphasize financial flows, select professional services networks, and cargo and passenger flows to represent connectivity – factors for which Greater Washington does not rank highly based on the nature of its regional economy. However, three recent studies summarized in the charts below show some more sophisticated ways of understanding globalization among cities and highlight ways in which Greater Washington participates in the global economy.

2008 Worldwide Centers of Commerce Index, Select Cities and Scores

	Ease of doing business	Financial flow	Business center	Knowledge creation and Information flow	Livability
2. New York	75.91	67.85	54.60	59.02	90.88
5. Chicago	73.81	52.51	40.52	46.31	90.81
25. Atlanta	71.69	8.78	33.69	38.21	88.63
35. Dallas	71.32	5.73	30.82	33.70	90.63
36. Washington	**71.78**	**5.54**	**24.14**	**37.46**	**91.56**
Range	36.68 (Caracas) – 82.82 (Singapore)	0.91 (Chongqing) – 84.7 (London)	10.39 (Chongqing) – 72.55 Hong Kong)	3.52 (Johannesburg) – 62.35 (London)	42 (Riyadh) – 94.38 (Vancouver)

Source: MasterCard Worldwide Centers of Commerce Index; 75 cities were evaluated and ranked.
"Business center" indicators include Port TEUs, Air passengers/Air phone traffic, Air cargo traffic, 5-star hotels, Commercial real estate development
"Knowledge creation and information flow" indicators include Number of universities, medical schools and MBA programs; Patent applications per million people, Search engine hits; Researchers per million people; Scientific and technical journal articles per million people; Broadband access per thousand people

2008 Global Cities Index, Select Cities and Rankings

	Business activity	Human capital	Information exchange	Cultural experience	Political engagement
1. New York	1	1	4	3	2
8. Chicago	12	3	24	20	20
11. Washington	**35**	**17**	**10**	**14**	**1**
37. Atlanta	38	24	39	21	32

Source: Foreign Policy, A.T. Kearney, and The Chicago Council on Global Affairs; 60 cities were evaluated and ranked.
Business activity includes the value of capital markets, the number of Fortune Global 500 firms headquarters, and the volume of the goods that pass through the city
Information exchange includes number of international news bureaus, the amount of international news in the leading local papers, and the number of broadband subscribers

In both studies, Washington is widely considered a global city, but not a leading global city, primarily because its business-related measures of activity remain weaker than other US cities like New York and Chicago, though they are more comparable to cities like Atlanta and Dallas. However, even among these latter two, Washington appears to have less business activity (especially measured by items like physical flow of goods and people) but more cultural, social and political connectivity.

A third study comparing world cities does not measure connectivity and flows, but instead assesses each city's stand-alone knowledge competitiveness. The rankings are based on a blend of human capital and knowledge capital measures (such as R&D and patent activity), as well as physical and financial capital, plus regional economy outputs (such as earnings, productivity and education expenditures). Washington ranks well on these factors compared to the other cities we have been examining, though its higher GDP may dilute its knowledge intensity rank.

World Knowledge Competitiveness Benchmarks, 2008

	Knowledge Competitiveness Rank	Knowledge Intensity Rank
New York	35	129
Washington	**41**	**139**
Chicago	46	99
Dallas	52	92
Atlanta	95	75

Source: Centre for International Competitiveness; 145 locations were evaluated and ranked. San Jose and Boston rank first and second respectively in the overall survey. Knowledge intensity is the ratio of Knowledge Competitiveness to GDP per capita.

Washington's Evolving Economy in the Global Context

Since Washington's economy is different from the economies in Atlanta, Dallas, Chicago, and New York, its ways of integrating into the global economy are also different. Washington's global strength is as a policy center. Since Washington has never been a manufacturing or financial center or a transportation hub, it is no surprise it does not fare well on comparisons that measure these activities.

Instead, Washington's private sector economy is a professional services economy, and it is specialized within this category as well. As these functions continue to become more important to global economic activity, it seems likely that Washington's business role will also become more important.

Other studies of Washington's role in the global economy have started to highlight these activities.

- Washington remains the world's most important political city. As a "policy hub" or "global political city"[1] Washington has a breadth and depth of critical connections to other cities and nations that accompany this function. The only other city in the world consistently grouped with Washington on these factors is Brussels.
- Related policy activities in Washington are a significant business of themselves as well as important functions that integrate the region into global networks. These activities include the international organizations and their networks (such as the World Bank and Inter-American Development Bank) plus policy-themed non-government organizations (NGOs) and think tanks.
- Some of Greater Washington's core industries are also integrated to various degrees into global networks. For example, the region's **engineering** industry is large enough to be considered important among global cities, but its connectivity is considered weak. This may be related to the strong defense-related activities in the regional industry, or it may be explained by the tremendous size of the US market. The **architecture** industry has been described as relatively small, but well connected globally. Finally, Washington's **legal services** segment is both substantial and globally integrated.

[1] "New political geographies: Global civil society and global governance through world city networks," Peter J. Taylor. Political Geography (24):703-730 (2005); "Global Political Cities as Actors in Twenty-First Century International Affairs," Kent E. Calder and Mariko de Freytas. SAIS Review 29(1):79-97 (2009).

How could these factors change the forecast industry and employment growth figures?

A globalized economy in which growth stems from connectivity and integration and favors large cities should provide opportunities for Greater Washington, especially in the business sector, which has lagged the public and not-for-profit sectors by most globalization measures.

- Greater Washington may become an even more attractive location for non-US organizations and businesses desiring proximity to policy decision-makers and the broad base of thought leaders in the region
- Greater Washington's advanced professional services strengths are in computer systems design and scientific research and development. The implications of globalization for these business activities may be positive, but this is not entirely clear.
    - The true extent of Washington's global networks in these areas is not yet known.[2] Global networks in these categories likely differ from networks in legal services, accounting and consulting that have been more thoroughly studied.
    - The nature of work in these categories – their ties to the US government and classified technology work for the US Department of Defense, for example – may limit companies' ability to develop global connections.
    - On the other hand, private sector government contractors have been described as "increasingly independent of the U.S. government and deployed—through market forces—in the interest of transnational and foreign actors as well."[3] If so, these contractors have incentives to expand their own global networks from a Greater Washington base.
- Greater Washington's other leading professional services activities – legal, public relations and communications, and management consulting firms – do appear to be active globally, but their networks appear to be smaller and different than those in cities like New York and Chicago.
- Air transportation is a positive for Greater Washington by supporting the ability to do business globally. While several other US cities have larger international air operations, Greater Washington has higher potential expansion capacity.
- Greater Washington's cosmopolitan and highly educated workforce is an advantage for the region that will support business operations seeking to work globally. Organizations hiring in Washington can find individuals with a global outlook, language skills and international experience.

What are the implications for the 2030 Group's agenda?

Globalization trends should largely provide economic growth opportunities for Greater Washington, partly building on its unequaled policy functions and partly extending its business networks.

In response to these trends, 2030 Group strategies may include:

- Assess the region's international air transport assets to ensure that Greater Washington is optimally positioned to support greater passenger traffic and ties to more parts of the world over the next 20 years.

[2] See NVTC global map for some insight on this point.
[3] Calder et al 2009

- Examine how Greater Washington's highly specialized advanced professional services participate in the global economy and determine steps that can strengthen their position.
- Support partners to expand their ability to attract global companies to Greater Washington.

2. Demographics: Aging & Immigration Executive Summary

Aging and immigration patterns will have important workforce implications for the region by 2030.

Aging

- The percentage of working age (18-64) individuals will decline relative to the senior population in Greater Washington by 2030.
- A growing proportion of workers say they intend to continue working past the age of 65.
- Greater Washington currently has an older population profile than either Atlanta or Dallas, although it has a lower percentage of retirement age population than the US as a whole.
- The percentage of senior workers in Greater Washington may grow faster than in other areas because the region already has relatively high labor force participation rates and high educational attainment.
- Employers will likely need to make accommodations to attract and keep seniors in the workforce.

Immigration

- Foreign-born workers will comprise 23% of the US working-age population in 2050. Without immigrants and their descendants, the working age population would actually decline.
- Policies that alter the flow of immigrants could have profound workforce implications for Greater Washington.
- Immigrants are found in both low skill and high skill occupations – they are 48% of low skill workers but also 40% of medical scientists and 33% of computer software engineers.
- Greater Washington's foreign-born population is larger, more established and more diverse than that in Atlanta, Dallas, or the US as a whole.
- The foreign-born population in Greater Washington is also more educated than immigrants in other cities.
- Still, the foreign born population in Greater Washington has a wide range of skill sets. Many newly arrived immigrants in Greater Washington are younger and have less education than previous arrivals.

In response to these trends, 2030 Group strategies may include:

- Raise awareness and address public policies affecting the participation of older workers in the labor force.
- Expand adult education programs to provide skills training to support seniors in the workforce.
- Ensure existing education systems at all levels are sufficient to serve the needs of the immigrant community in terms of English language instruction, workforce training, and access to degree programs.

2. Demographics: Aging & Immigration

The nation's senior population (age 65 and over) will more than double in size from 2005 through 2050. In 2005, the proportion of seniors in the population was approximately 1 in 8; by 2050 it will rise to nearly 1 in 5.

The proportion of the working age population is expected to decline from 63% in 2005 to 58% in 2050. There will be 72 dependents (seniors and children) per 100 adults of working age in 2050, up from 59 in 2005.

(Pew Research Center, February 2008)

The composition of the workforce will change as the US population ages. The percentage of traditional working age (18-64) individuals will decline relative to the senior population. At the same time, a growing proportion of workers (currently estimated at 50%) say they intend to continue working past the age of 65, eschewing traditional retirement. Both factors have important regional workforce implications.

- The proportion of senior and pre-senior workers varies by region and industry. Certain sectors, like government, have higher percentages of older workers.
- In 2007, approximately 20% of men and 11% of women in the US over the age of 65 were in the labor force. These figures are expected to increase over time, though they may not reach the 50% of individuals who say they intend to stay in the workforce past age 65.
- The ability and inclination to work past age 65 depends on savings, age, gender, health, and education, among other factors. Many of these factors vary by region.
- Seven in ten older workers who intend to work seek non-traditional work schedules, including part-time and part-year employment, or other types of "bridging" arrangements, such as consulting, that may present challenges – or opportunities - for employers.

Future immigrants and their descendants born in the United States account for all growth in the working-age population [from 2005 to 2050], adding 76 million people to the 2050 size of this group. Absent new immigration, there would be a decline of 7 million people in this group.

(Pew Research Center, February 2008)

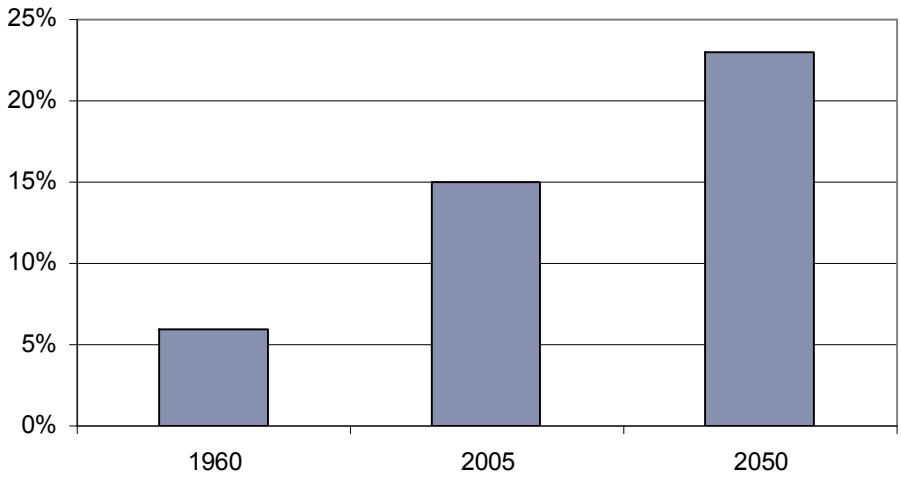
Foreign-born workers will comprise 23% of the US working-age population (18-64) in 2050 (Figure 1). Their education, occupation and industry experiences often differ from the native born population (Figures 2 and 3). For example, immigrants are more likely than native born workers to have an advanced degree, but they are also more likely to have less than a high school education. Immigration patterns have several regional workforce implications:

- Immigrants are not evenly spread across the US, but are instead concentrated in metropolitan areas. Policies that alter the flow of immigrants could have profound workforce implications for many regions.
- 81% of immigrants are between the traditional working ages of 18-64, compared to 60% of the native born population.
- Immigrants are found in both low skilled and high skill occupations.

- Today, immigrants are 13% of US residents, 15% of US workers, 21% of low wage workers, and 48% of low skill workers.
- At the same time, 1 in 4 doctors, 2 in 5 medical scientists, 1 in 3 computer software engineers, and 1 in 5 computer programmers are immigrants.

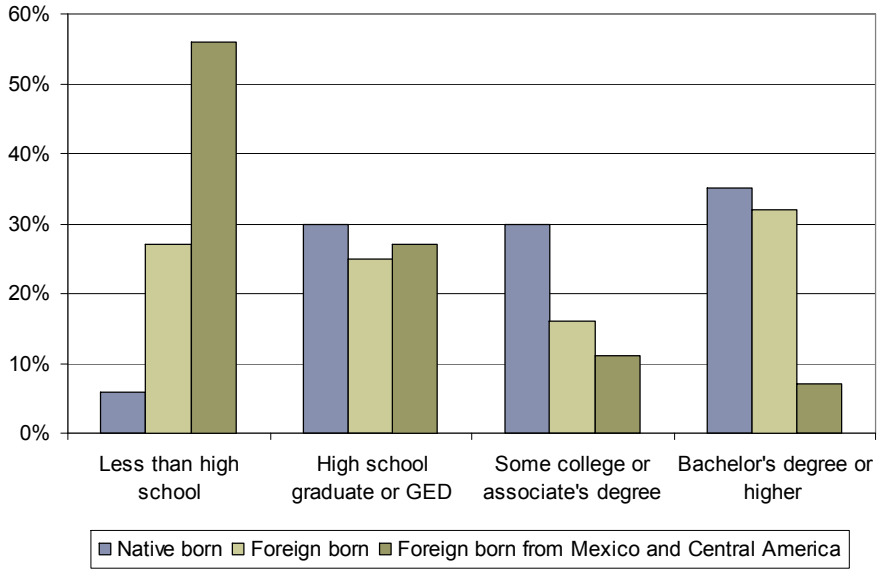
- Foreign students and immigrants make up more than half the scientific researchers in the United States; in 2006, they received 40% of science and engineering PhDs and 65% of computer science doctorates. Among postdoctoral students doing research at the highest levels, 60% are foreign born.
- Age, education, gender, English language proficiency, region of origin, and the path that brought them to the US affect the current and potential role of immigrants in the workforce. These factors also vary by region.

Figure 1. Foreign-born Share of Working Age Population, Actual and Projected (US)



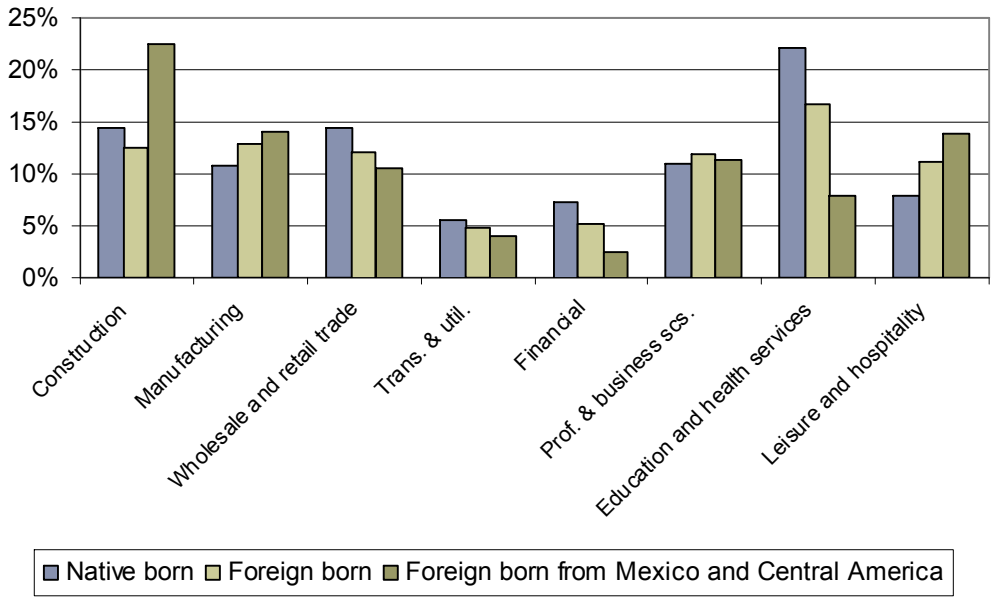
Source: Pew Research Center, 2008

Figure 2. Education among Workers Age 25+ in the Civilian Labor Force, 2008 (US)



Source: Migration Policy Institute analysis of US Census Bureau, Current Population Survey, Socioeconomic Supplement, March 2008 (in Immigrants and the Current Economic Crisis, January 2009)

Figure 3. Industry Employment among Native and Foreign Born Workers in Civilian Labor Force, US (2008) (percent of workers in each category employed in each industry)

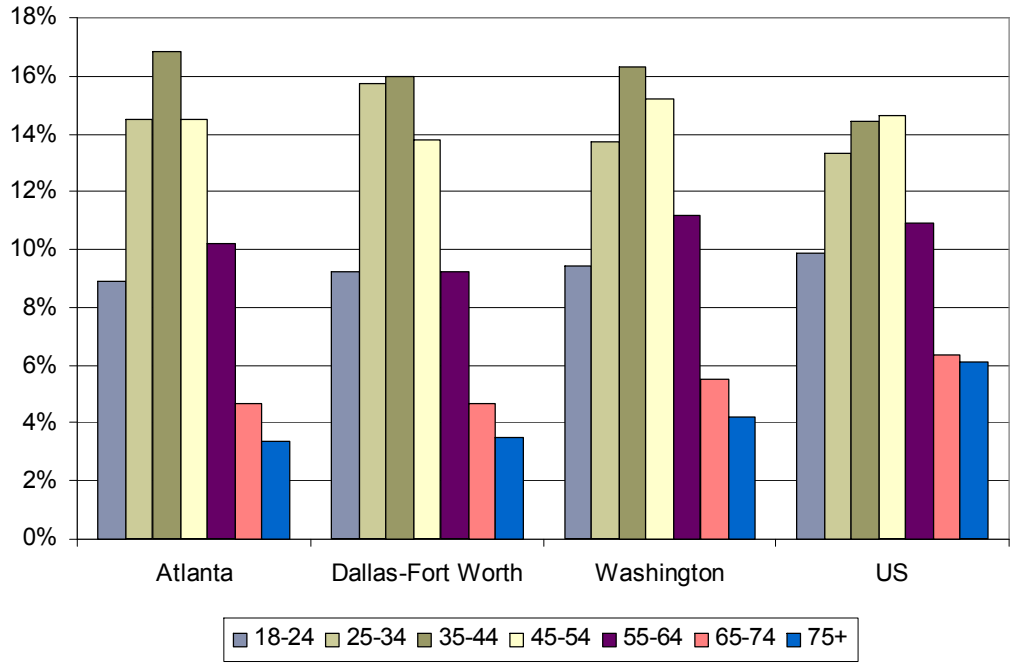


Source: CRA calculations based on Migration Policy Institute analysis of US Census Bureau, Current Population Survey, Socioeconomic Supplement, March 2008 (in Immigrants and the Current Economic Crisis, January 2009)

Will these trends affect Greater Washington differently than other regions?

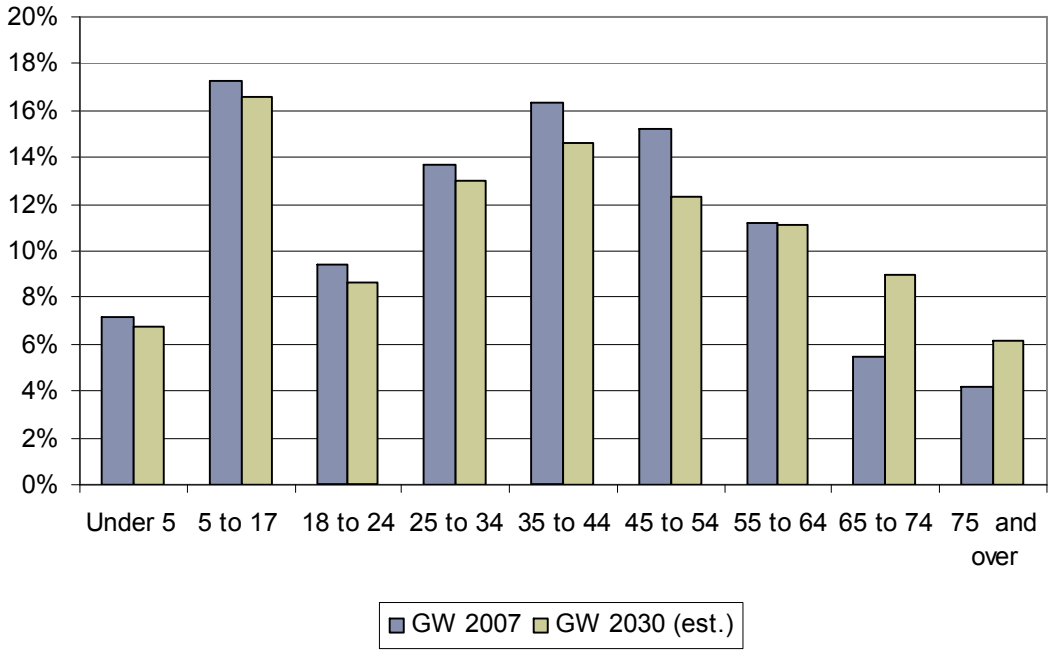
Yes. Greater Washington currently has an older population profile than fast-growing regions Atlanta and Dallas (Figure 4), although it has a lower percentage of retirement age population than the United States as a whole. As everywhere, the working age population in Greater Washington will decline relative to the retirement age population by 2030 (estimates in Figure 5).

Figure 4. Age Distribution 2007



Source: US Census, American Community Survey

Figure 5. Current and Estimated Age Distribution for Greater Washington

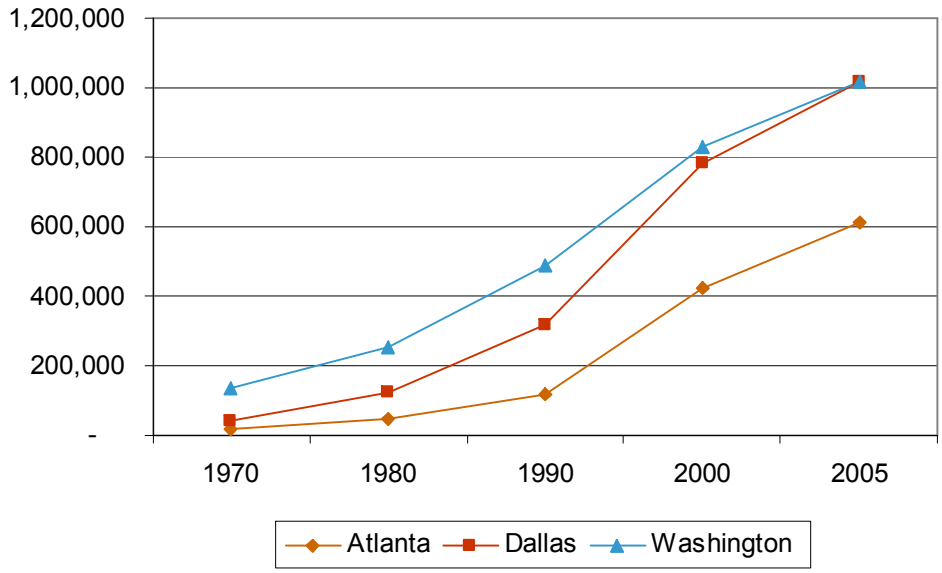


Source: US Census and CRA calculations; assume Greater Washington's population categories change at the same rate as US population categories.

The effect of this demographic shift on the labor force may be less pronounced than the population data suggest. Labor force participation rates among seniors are expected to increase. Greater Washington already has relatively high labor force participation rates and high educational attainment, both of which suggest that the percentage of senior workers in Greater Washington may grow faster than in other regions. Still, there are many unknown factors about the size and nature of the future senior workforce.

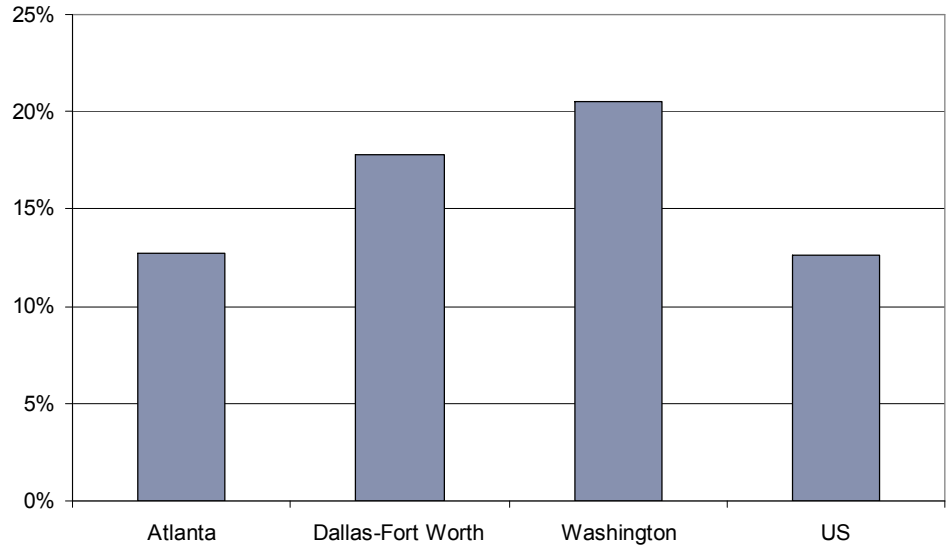
Immigration patterns will also affect the Greater Washington economy in different ways than in other regions. Greater Washington's foreign-born population is larger, more established and more diverse than that in Atlanta, Dallas, or the US as a whole (Figures 6, 7 and 8).

Figure 6. Foreign Born Population



Source: Singer, 2008

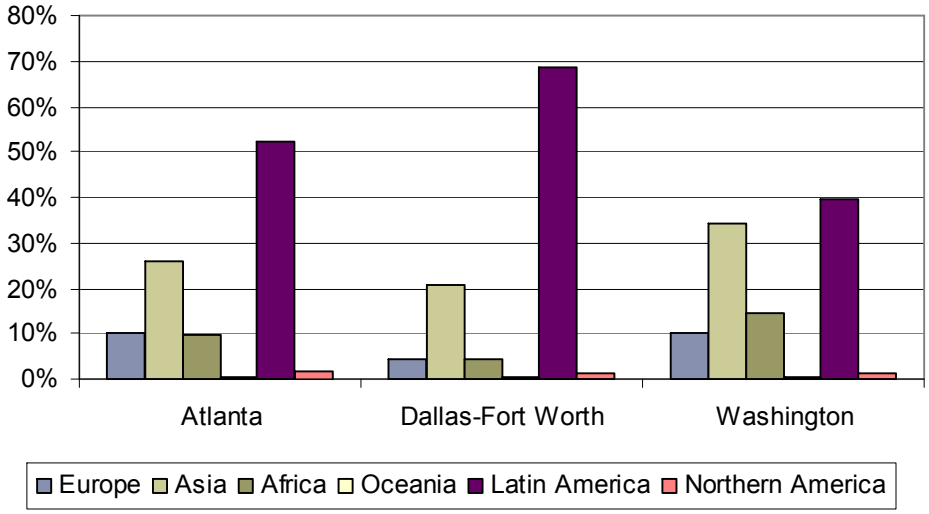
Figure 7. Foreign-born Population as Percentage of Total Population, 2007



Source: US Census, American Community Survey

Greater Washington has a lower percentage of immigrants from Latin America, especially Mexico, than most immigrant gateways (Figure 7). Mexico is, by far, the greatest single source of immigrants for Atlanta (30%) and Dallas (58%). By contrast, the top three countries of origin for immigrants to Greater Washington are El Salvador (13%), India and Korea.

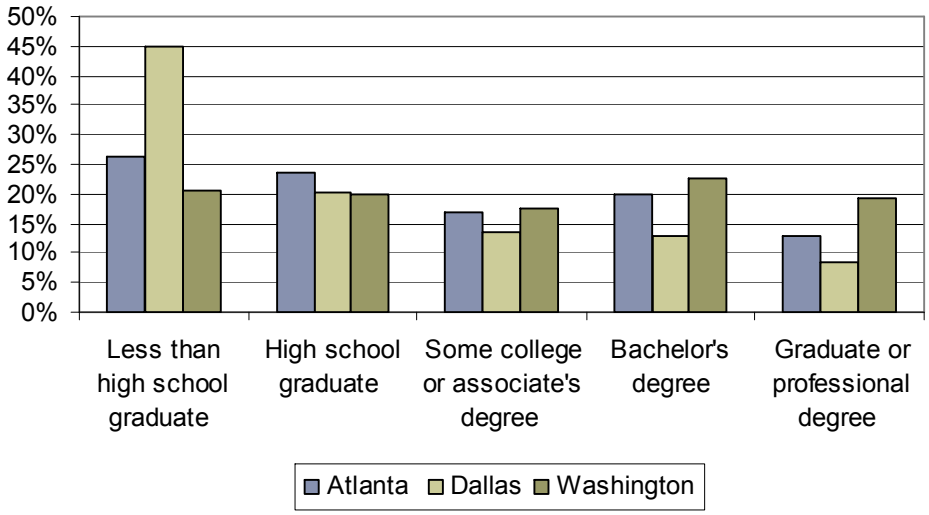
Figure 8. Foreign Born Population by Place of Birth, 2007



Source: US Census, American Community Survey

The foreign-born population in Greater Washington tends to be more educated than immigrants in other cities (Figure 8). Further, the foreign born account for 23% of the population age 25 and over with a college degree or higher in Greater Washington, compared to 15% and 16% in Atlanta and Dallas, respectively.

Figure 8. Educational Attainment Among Foreign Born Age 25 and over, 2007



Source: CRA calculations, US Census, American Community Survey

Yet recent trends suggest changes are underway that may affect the future workforce. Washington's Latin American immigrant population has grown tremendously, reaching approximately 420,000 in 2006. Approximately one-third of these immigrants have arrived since 2000. The region's Latin American

immigrant population is comprised largely of working-age adults with high rates of employment, but more than one-third lack a high school diploma and two-thirds are not proficient in English.[4]

In addition, approximately one-fourth of children aged 5-17 in the region speak a language other than English at home. Over 40% of all Greater Washington immigrants are considered limited English proficient (LEP). Finally, it is estimated that one-third of immigrants in the Washington metropolitan area are in the United States illegally.[5]

How could these factors change the forecast industry and employment growth figures?

The aging population and the expanding foreign-born population will affect workforce growth and composition in all regions, but there may be additional issues specific to the Greater Washington economy that will affect growth in the region's core sectors and forecast growth industries.

- Other studies have noted that retiring baby boomers will most affect the utilities, aerospace and transportation industries plus all levels of government. More research needs to be done to assess the relationship between age and industry employment in our region.
- Given Greater Washington's reliance on government and the defense/aerospace industries in the knowledge economy and the critical role highly educated immigrants play in many scientific and technical fields, the legal status and the path to citizenship of the large immigrant population could be significant.
- Finally, many of the jobs in the growing knowledge industries require advanced education. Educational attainment and English language proficiency among the foreign born workforce at the lower end of the skill spectrum (and their children) will be a critical economic issue for the region.

What are the implications for the 2030 Group's agenda?

While Greater Washington has been able to attract talent from outside the region to fill its high skilled jobs, it may be risky to assume it will always be able to do so. Further, enabling the population to increase its language, educational and skill levels can increase the size of the local talent pool to the benefit of employers as well as workers. Finally, immigrants have been the intellectual drivers in many technology-based companies in the US, and they are expected to remain necessary to most science and technology-driven industries.

In response to these trends, 2030 Group strategies may include:

- Raise awareness and address public policies affecting the participation of older workers in the labor force.
- Expand adult education programs to provide skills training to support seniors in the workforce.
- Ensure existing education systems at all levels are sufficient to serve the needs of the immigrant community in terms of English language instruction, workforce training, and access to degree programs.

[4] "Twenty-First-Century Gateways. Immigrant Incorporation in Suburban America." Audrey Singer, Susan W. Hardwick, Caroline B. Bettrell (eds.). Brookings Institution Press, Washington, DC (2007).
[5] Ibid. and "Immigrants, Politics, and Local Response in Suburban Washington," Audrey Singer, Jill H. Wilson and Brooke DeRenzis. Metropolitan Policy Program at Brookings, Washington, DC (2009).

3.How We Work
Executive Summary

- Communication and collaboration technologies and information accessibility are expected to continue to improve and become more ubiquitous.
- Alternate employment arrangements (such as use of independent contractors instead of employees) and flexible work arrangements (such as telework) may not replace the traditional workplace any time soon, but these arrangements are likely to expand in Greater Washington over the coming years. These trends will affect demand for office space and use of transportation systems.
- Older workers and young Generation Y workers strongly desire flexible work arrangements, including job sharing, compressed workweeks, part-time or part-year schedules, and flexible schedules.
- Regions with employers that offer flexible work arrangements may have some advantages in the competition for talent.
- The federal government is a leader in flexible work arrangements, providing Greater Washington area employers with a model and experience in making such programs work. Greater Washington is also considered a national leader in telework potential, providing a possible advantage relative to competitor cities.
- Productivity-enhancing technologies may change long-term employment growth prospects in several industries. Professional services industries should mostly benefit, while the retail, education and healthcare industries, which are more important growth drivers for other regions, may experience lower than expected employment growth.

In response to these trends, 2030 Group strategies may include:

- Work with existing business groups to promote the benefits of flexible work arrangements, including telework, for attracting and retaining talent in the region.
- Promote regional policies that encourage telework.

3.How We Work

Technology, business and demographic trends will continue to change when and where work is done and to alter expectations of the relationship between employers and workers. These changes are already underway and are likely to continue to evolve and encompass more elements of the regional economy.

These trends are enabled by technology. Communication and collaboration technologies are widely expected to improve and become more ubiquitous. Constant communication, more "self-service" technologies (requiring less staff support), and the leveling of access to data (requiring less middle management) all mean that traditional offices and corporate structures are no longer the only way to provide the setting and support necessary to work productively.

Businesses have also become increasingly likely to use various alternate employment arrangements to give themselves maximum flexibility to respond to market signals in the rapidly moving global economy. They are becoming more project-oriented and more likely to outsource. They are less likely than before to hire full-time employees to perform every function and more likely to turn to temporary agencies to help ramp up (or down) to meet demand, to hire highly specialized firms or individual contractors on an as-needed basis, and use contract workers for entire segments of their business operations.

While most workers still seek full-time employment, many are also increasingly seeking flexibility in their work arrangements to allow them to meet family or personal commitments. Workers nearing retirement age, families with childcare or eldercare requirements, and Generation Y workers are all less inclined to desire a job that requires them to be in one place at proscribed times to work. Businesses also increasingly recognize the value of allowing their employees to work flexible schedules at various sites.

The downside to some these trends is that some workers may be separated from traditional workplace protections and benefit systems, such as health insurance, retirement plans, and unemployment insurance. Further, most labor laws and regulations are not designed to protect nonstandard workers.

To address these trends three inter-related topics that describe changes in how we work are highlighted below:

- Telework - Work from Where We Are Connected
- Flexible Work Practices
- Alternate Employment Arrangements

Telework - Work from Where We Are Connected

Telework here is an all encompassing term referring to work performed from home or from another remote location such as a client site, while traveling, at a designated telework center, or other places. Government and private companies have been responding to both their business needs and worker needs by establishing telework programs.

Data on the scope of telecommuting provide different pictures of the trend. The Information Technology & Innovation Foundation has estimated that 3.9% of the US workforce telecommuted in 2006, but that 14% of current jobs could be converted to telecommuting positions. A survey of working adults indicated that 33.7 million people telecommuted at least once a month in 2008[6], a 17% increase from 2006. One

[6] Telework Trendlines 2009

study reports that 38% of US companies allow telecommuting[7], while another puts the figure closer to 50%[8].

Telework has many business and community advantages.

- Most research suggests individual worker productivity improves through telework, primarily because less work time is lost to commuting and worker absences
- Businesses gain by reducing costs associated with office space
- Telework options help attract and retain workers
- Remote work arrangements, including established telework procedures, are increasingly seen as a necessary continuity of operations (COOP) issue
- Reducing commute time enhances efforts to reduce pollution, including greenhouse gas emissions, decreases traffic congestion, and reduces vehicle miles traveled

Still, some barriers to telework remain, such as availability of high-speed broadband access, though these issues become less important over time. Business factors, including management reluctance and non-compatibility of certain jobs, may also limit growth in telework.[9]

Flexible Work Arrangements

Flexible work arrangements change the schedule or amount of time worked and/or the location of work. These arrangements may include programs or policies such as flexible schedules, telework, reduced time, compressed workweeks, working at home regularly or occasionally, job shares, part-year work, and phased retirement.

The Center for Work Life Policy reported in a recent study that 87% of boomers and 89% of Generation Ys rated flexibility an important consideration in choosing an employer. Many reports on the best places to work, including Best Places to Work in the Federal Government, include flexible arrangements among their rating criteria.

Businesses are already implementing many of these arrangements. For example:

- The "50+ Workforce Survey" conducted in 2006 by the Institute for a Competitive Workforce found 41% of surveyed businesses offer flextime, while over 40% allowed a move from full-time to part-time work. The survey also found that older workers mostly seek flexible hours and phased retirements as they continue working.
- The 2008 National Study of Employers, which included non-profits, found 50% of organizations allow work at home, 53% allow phased retirement, 38% offer a compressed workweek, 29% allow job share, and 27% allow part-year work for some, though not all, employees.

Businesses are increasingly adopting flexible work policies primarily to retain and attract talent, followed by a desire to help employees manage work/family life and enhance morale. Barriers remain the lack of management support or policies to support a range of flexible arrangements.

Alternate Employment Arrangements

A separate but related issue is alternate employment arrangements. Workers in alternate employment arrangements are not employees and are therefore different than the group covered by most employer-sponsored flexible work policies.

[7] Hewitt Associates, cited in "Improving Quality of Life through Telecommuting." ITIF 2009
[8] 2008 National Study of Employers
[9] "Improving Quality of Life through Telecommuting," Wendell Cox. The Information Technology & Innovation Foundation, Washington, DC (2009).

It is difficult to measure these workers for the nation, let alone for regions. Estimates using different data sources and definitions can vary widely. However, one estimate suggests that up to one-third of US workers are not standard full-time, year-round employees[10]. These workers fall into the following categories:

- 44% standard part-time
- 24% independent contractors
- 14% self-employed
- 7% direct-hire temps
- 6% on-call and day labor
- 3% agency temps
- 2% contract company

Other sources suggest that only 2-3% of US workers are contingent (meaning no expectation of long-term employment with their jobs), including temporary help workers, while 11% are in alternate employment arrangements, which includes self-employed, independent contractors and contract workers. The latter figure seems low given that non-employer firms (self-employed) alone are approximately 15% of the private sector workforce in Greater Washington.[11]

While many contingent workers would prefer full-time employment, many more workers in alternate arrangements prefer the flexibility and variety their status provides.

Will these trends affect Greater Washington differently than other regions?

They may. The trends described above apply to all regions, but there is insufficient data to compare regions based on telework, availability of flexible work arrangements, or alternate employment arrangements.

The future differences among regions will likely lie in employer response to these trends. Alternate employment arrangements may or may not create benefits for regions depending on the volume, type, and skill levels involved. By contrast, regions with employers that can provide attractive flexible work arrangements, including telework, should have an advantage in attracting and retaining workers. This in turn should create greater growth opportunities for core industries.

Washington appears well-positioned in this regard though comparative data are not available. In 2006, Washington was named the best city for teleworking based on the potential benefits that teleworking would offer residents based on a host of factors including typical commuting times, fuel prices, availability of broadband Internet access and percentage of the population in telework friendly jobs. Further, the federal government is a telework leader. By law, federal agencies are required to establish telecommuting policies, and many flexible work policies are in place for federal employees. Other major regional employers, such as Capital One and Discovery Communications, are also considered leaders in flexible workplace practices.

Virginia is also considered a leader among state governments for telework. Not only does the state support teleworking among state employees, but the Telework Virginia initiative strives to increase private

[10] US Government Accountability Office, cited in "Defining the Independent Workforce," Freelancers Union, 2006.
[11] Calculation based on County Business Patterns and Nonemployer Statistics, 2007.

sector telework, including offering companies up to $35,000 to set up a telework program. Georgia is also considered a state government leader, and it offers a Telework Tax Credit for eligible private sector employers.

How could these factors change the forecast industry and employment growth figures?

It is not clear if these trends will have an impact on overall industry and employment growth trends, but they will likely affect how work is organized and distributed in several industries. For example, telework, flexible work arrangements, and alternate employment arrangements have already been implemented in the federal sector, helping to fuel an expansion in Greater Washington's professional services sector.

Recent studies have suggested that non-profit, finance, and professional services businesses are more likely to have flexible work arrangements than goods-producing businesses. Companies with fewer union members, fewer hourly employees, and more women and minorities are also more likely have flexible work policies. Greater Washington's industry mix and demographics match these characteristics more so than many other locations. These factors suggest that Washington area employers have and will continue to expand flexible work policies, perhaps at a faster rate than employers in other cities with different industry profiles. If so, research indicates that Greater Washington may have an advantage in retaining and attracting talent.

While this report has emphasized changes in the way we work, the underlying driver allowing these changes to occur is information and communication technology. Specific technology changes are not predicted here, but it is likely that these developments will affect some industries differently than others. For example, professional services industries should mostly benefit from anticipated technology changes, while the retail, education and healthcare industries, which are more important growth drivers for other regions, may experience lower than expected employment growth as productivity improves.

What are the implications for the 2030 Group's agenda?

In response to these trends, 2030 Group strategies may include:

- Working with existing business groups to promote the benefits of flexible work arrangements, including telework, for attracting and retaining talent in the region.
- Promote regional policies that encourage telework.

4. Energy and Environment Executive Summary

- Energy and environmental issues are likely to change "business as usual" for the private and public sectors in Greater Washington through 2030.
- International, federal, and state and local actors are all considering ways to address climate change, environmental quality, energy supply/demand, and greenhouse gas (GHG) emissions. However, much of the policy discussion at all levels of government is in flux now, making the specific implications for Greater Washington unclear.
- Reducing greenhouse gas emissions is expected to be an important regional climate and energy priority, with impacts on electric power plant investment decisions, transportation choices, land use patterns, and energy use in commercial buildings, among other items.
- Greater Washington communities may also increasingly adopt adaptation strategies in response to expected rises in temperature and extreme weather that will affect land use, coastal developments, and metropolitan infrastructure planning, among other themes.
- In terms of energy efficiency and other energy-related technologies, all regions believe they are well positioned to use their universities and knowledge-based workforces to take advantage of federal spending and growth in the green economy. Since the green economy remains loosely defined and many technologies are still in the early stages of development, it is not clear that any individual location, including Greater Washington, has a meaningful advantage in this arena.
- It is possible that energy and environmental policies could affect the forecast industry and employment growth figures by effectively limiting growth in Greater Washington, but it seems more likely the impact over the next twenty years will involve changes in how and where expected growth occurs.

In response to these trends, 2030 Group strategies may include:

- Determine the priority issues among the energy/environmental plans under development and establish and communicate the Group's positions to the organizations shaping these policies.

4. Energy and Environment

The inter-related issues of energy and the environment (including climate change) and policy responses at the international, federal, state and regional levels will likely affect growth patterns in Greater Washington and elsewhere.

Many policymakers base their current approach to these issues on the 2007 finding of the Intergovernmental Panel on Climate Change that "warming of the climate system is unequivocal." Further, international and US scientific panels convened to examine climate change have concluded it is very likely human activity is primarily responsible for the warming. Accordingly, efforts are underway at all governmental levels to understand the effects of the warming climate and to reduce the activities (especially greenhouse gas (GHG) emissions) responsible for the warming.

International, US, and regional studies all state that warming is expected to be "considerably greater" this century than last, but that specific regional and local effects are not clear. Climate changes that have already been observed in the US include rising sea levels, increases in air and water temperatures, and increased frequency and intensity of downpours.

These changes are expected to affect health, water supply, viability of coastal areas, and demands on infrastructure, among other factors in our economy. Cities and coastal areas will likely experience the biggest challenges. Greater heat, more frequent floods and downpours, drought in some places and rising sea levels and storm surges in other places are all expected to tax regional infrastructure – water, stormwater, transportation, and electricity systems.

In response, governments are developing policies to reduce greenhouse gas emissions, which are expected to help reduce future warming but not entirely reverse it. Carbon dioxide emissions are a primary focus of these strategies since they account for 85% of GHG emissions. Fossil fuel combustion accounts for 94% of carbon dioxide emissions. Transportation and electricity generation are the largest categories responsible for these emissions, while the transportation and industrial sectors represent the largest end-users.

International, federal, and state and local actors are all considering ways to address climate change, environmental quality, energy supply/demand, and greenhouse gas (GHG) emissions. Many policy initiatives are still being negotiated, so the specific path each actor will take and the implications for regional economies are not yet clear.

Regardless of the details, almost all policy efforts refer to a combination of mitigation and adaptation responses. Mitigation means taking measures to reduce climate change, for example, by reducing emissions. Adaptation means improving the ability to cope with harmful impacts or to take advantage of beneficial changes.

This briefing will summarize several major energy and environmental policy processes underway and discuss the potential effect that their outcomes may have on regional growth opportunities.

United Nations Framework Convention on Climate Change (UNFCCC) and the Copenhagen Conference

The UNFCCC is a treaty under which the signatories "consider what can be done to reduce global warming and to cope with whatever temperature increases are inevitable." The Kyoto Protocol, which sets binding targets for reducing greenhouse gas emissions, is an addition to this treaty. The US is a party to the UNFCCC but has not ratified the Kyoto Protocol. The Conference of Parties (COP) to the UNFCCC will meet at the United Nations Climate Change Conference (COP 15) in Copenhagen on

December 7-18, 2009. COP decisions become the set of rules for implementation of the UNFCCC. The UN discussions and research on climate change matter because at the very least they become the touchstone for policymakers seeking to address these issues at the national and local levels.

Conference organizers hope to move beyond the emission reduction focus of the Kyoto protocol and "provide clarity" - if not total resolution - on four issues:

- Ambitious emission reduction targets for developed countries
- Nationally appropriate mitigation actions of developing countries
- Scaling up financial and technological support for both adaptation and mitigation
- An effective institutional framework with governance structures that address the needs of developing countries

Energy Forecasts

Two of the leading energy issues for the US economy are oil price volatility and long-term growing demand for energy, especially among developing countries. Accordingly, real oil prices are widely expected to rise over the long term but not necessarily in a predictable pattern.

The US Energy Information Administration in its Annual Energy Outlook also foresees greenhouse gas (GHG) emissions and its impacts on energy investment decisions (such as electric power plant capacity investments), the increasing use of renewable fuels, the increasing production of unconventional natural gas, the shift in the transportation fleet to more efficient vehicles, and improved efficiency in end-use appliances as important trends through 2030.

US Climate and Energy Approaches

While the US is now expected to be a more "robust" participant in international efforts, most of its energy and environment activities remain focused domestically. At the federal level, many of these activities are organized around energy efficiency, renewable energy sources, and technology initiatives. Most of these efforts are positioned as advancing energy security, creating jobs, and establishing technology leadership. Examples cited by the White House include clean energy investments through the American Recovery and Reinvestment Act that range from smart grid investments and grants for next generation battery development to home weatherization projects, fuel economy standards, efficiency standards for household appliances, and next generation energy technology investments.

American Clean Energy and Security Act (Waxman-Markey)

This bill passed the House June 2009. Its prospects in the Senate are not clear. As it stands, the bill:

- Requires utilities to meet 20% of their electricity demand through renewable energy sources and energy efficiency by 2020
- Caps greenhouse gas emissions starting in 2012, with a 3% cut (from 2005 levels) by 2012 and 42% cut by 2030
- Establishes a program of tradable emission permits and allows carbon offsets
- Invests $190 billion in clean energy technologies and energy efficiency by 2025
- Mandates new energy-saving standards for buildings, appliances, and industry
- Requires carbon capture and sequestration for new coal-fired power plants
- Addresses modernizing the electricity grid

Will these trends affect Greater Washington differently than other regions?

Energy and environmental issues are likely to change "business as usual" for the private and public sectors in Greater Washington through 2030. However, it is not clear whether the impact will be significantly different compared to other major cities.

Global warming trends and national energy and environment programs and regulations will affect all regions, but effects and policy responses may be different. For example, the rise in sea levels is a very important issue for New York and for the Chesapeake area around Washington, but not so for Atlanta and Dallas. Yet Dallas and Atlanta appear more prone to drought and water shortages than Greater Washington, and this could have significant effects on their long-term growth prospects.

Most cities expect warmer temperatures and more extreme weather, including severe storms; therefore they all anticipate strains on utilities, transportation infrastructure and stormwater systems. Dallas, Atlanta and Washington are already air quality non-attainment areas, yet all will have large energy demand increases based on anticipated population and job growth.

It does appear that Greater Washington's policymakers are somewhat ahead of the curve compared to Dallas and Atlanta in terms of beginning to prepare for climate change. Several of the current planning processes are summarized below. The recommendations and policy actions to restore the Chesapeake Bay are, of course, unique to the Washington region. However, since the policy concepts are still in development, the real implications are not yet clear.

In terms of energy efficiency and other energy-related technologies, all regions believe they are well positioned to use their universities and knowledge-based workforces to take advantage of federal spending and growth in the green economy. Since the green economy remains loosely defined and many technologies are still in the early stages of development, it is not clear that any individual location has a meaningful advantage in this arena.

Regional Climate and Energy Approaches

State and local governments are increasingly concerned about the impact of climate change on their communities and have responded with both their own emissions inventories and climate change strategies. New York (PlaNYC) and Chicago (Climate Action Plan) are two examples of cities that have addressed climate change directly in their planning processes.

Governments and organizations in Greater Washington, including the states of Virginia and Maryland and the Metropolitan Washington Council of Governments (MWCOG), have also begun to consider the implications for our region and their potential responses. This section will provide a very brief summary of their recommendations and action plans.

> ***Maryland's greatest challenge is likely to be in adapting to climate change along its expansive coast, as this is where the most significant economic and ecological impacts will occur. The state's economy is particularly vulnerable because of the scale of development along the coast and the high rate at which coastal erosion and subsequent water elevation will afflict its shoreline.***
>
> ***Maryland Climate Action Plan, 2008***

"Climate change, sea level rise and associated coastal storms are putting Maryland's people, property, natural resources, and public investments at risk" (Executive Summary, p.5). Maryland's Climate Action Plan recommends legislative and policy actions to:

- Promote programs and policies aimed at the avoidance and/or reduction of impact to the existing built environment, as well as to future growth and development in vulnerable coastal areas
- Shift to sustainable economies and investments and avoid assumption of the financial risk of development and redevelopment in highly hazardous coastal areas
- Enhance preparedness and planning efforts to protect human health, safety and welfare
- Protect and restore Maryland's natural shoreline and its resources, including its tidal wetlands and marshes, vegetated buffers, and Bay Islands, that inherently shield Maryland's shoreline and interior

Priority policy recommendations address coastal planning, building code revisions, a Green Economic Development Initiative to foster market opportunities related to climate change, natural resource protection, and observation, outreach and planning programs, among other themes.

The state's goals are also to reduce GHG emissions 10% by 2012 (from 2006 levels) and 25-50% by 2020. The plan includes 42 mitigation policies to reduce GHG emissions that cover Residential, Commercial and Industrial users; Energy Supply; Agriculture, Forestry and Waste Management; and Transportation and Land Use.

> ***Climate changes such as sea level rise pose serious and growing threats to Virginia's roads, railways, ports, utility systems, and other critical infrastructure.***
>
> ***Virginia Climate Change Action Plan, 2008***

As in Maryland, the Virginia Climate Action Plan notes that the most worrisome effects of climate change will occur in the state's coastal areas, but much of the state's infrastructure may also be affected. The report also cites the Virginia Energy Plan, which calls for greater efficiency and conservation efforts, but still notes that capacity must increase to accommodate projected growth. For example, electricity demand is projected to grow by 26.8% over the next 15 years in the part of Virginia served by Dominion Virginia Power.

Still, Virginia has established a GHG reduction target of 30% below the business-as-usual projection of emissions by 2025. Virginia's recommendations to achieve this target emphasize programs and assistance to increase energy efficiency and conservation, reducing vehicle miles traveled, increasing the efficiency of the transportation fleet, increasing use of renewable energy sources, and promoting research, including research for carbon sequestration, capture and storage technologies. The plan's adaptation recommendations emphasize state and local government capacity to monitor, track, report, and prepare for climate change impacts.

> ***Energy, climate, and environmental concerns are having profound effects on the region by reshaping development preferences and goals to meet the types of land uses and transit options that communities desire. Future economic growth will most likely depend on finding reliable low carbon alternatives to build a sustainable future.***
>
> ***National Capital Region Climate Change Report, 2008***

The Metropolitan Washington Council of Governments (MWCOG) has prepared a climate change report for Greater Washington with many energy, transportation and land use recommendations. In 2008 MWCOG adopted regional GHG reduction goals of 10% below business as usual by 2012 and 20% below 2005 levels by 2020. MWCOG has also established a Climate, Energy and Environment Policy

Committee (CEEPC) to "provide leadership on climate change, energy, green building, alternative fuels, solid waste and recycling issues, and will help support area governments as they work together to meet the goals outlined in the National Capital Region Climate Change Report."

Major themes of the report include:

- Mitigating emissions from energy consumption
- Mitigating emissions from transportation and land use
- Anticipating regional economic development
- Preparing for the impacts of climate change
- Establishing financing mechanisms
- Launching a regional outreach and education campaign
- Local government leading by example
- Advocacy positions

Recommendations address improving energy efficiency in buildings, reducing demand for energy, reducing GHG emissions, promoting clean energy sources, increasing fuel efficiency and use of clean-fuel vehicles, reducing vehicle miles traveled, improving land use, and preparing a regional adaptation plan, among others.

Chesapeake Bay

Longstanding efforts to clean and protect the Chesapeake Bay have emphasized upgrading sewage treatment plants, agricultural conservation practices, reducing stormwater pollution, protecting and restoring riparian buffers and wetlands, and land conservation. A recent report also addressed broader factors that affect climate change impacts in the Bay such as transportation, buildings, and residential energy use issues.

Trying to move beyond studies and plans, the Chesapeake Bay Foundation has also sued the US Environmental Protection Agency (EPA) to require it "to enforce the law and reduce pollution sufficiently to remove the Chesapeake Bay from the federal 'impaired waters' list." In May, President Obama signed an executive order making the Chesapeake Bay cleanup a national priority, promising a larger and more aggressive federal role. On September 9, the EPA released a series of reports required under that executive order. These reports involved several federal agencies and addressed water quality, agriculture, stormwater management, adapting natural resources programs and infrastructure to climate change impacts and improving research and monitoring. Initial comments on the reports emphasize the new regulations for stormwater and agricultural runoff and the stronger federal role in ensuring the states enforce relevant rules. However, these represent only the first step in this new federal process, since draft strategies will be released in November with a final plan expected to be released by May 2010.

> ***"States will be given a certain amount of pollution to reduce and will have two years to submit a plan for doing so. If they don't make a plan, or if the plan isn't good enough, the EPA can cut their federal grants or reject permits for new shopping malls, sewage plants or suburban developments."***
>
> ***Washington Post (online), 9/10/09***

How could these factors change the forecast industry and employment growth figures?

It appears that these factors may affect the overall growth and/or distribution of employment by 2030, but there do not seem to be any direct implications for Greater Washington's core industries.

It is possible that energy and environmental policies could affect the overall forecast industry and employment growth figures by effectively limiting growth in Greater Washington, but it seems more likely the impact over the next twenty years will involve changes in how and where expected growth occurs.

For example, it seems likely that land use patterns will change to become more compact over time. Such changes are consistent with nearly all the energy and environment policy recommendations at all levels, including those related to managing stormwater runoff, protecting areas adjacent to the Chesapeake Bay, and reducing vehicle miles traveled. If this occurs, it may create the capacity to include a greater percentage of the region's population and jobs within the boundaries of the Washington MSA.

However, it is possible that overall development restrictions may occur based on a combination of federal/state regulations regarding protecting the Chesapeake Bay, possible limits on future electric power plant investment that could serve new growth, and/or utility price increases based on the need to limit greenhouse gas emissions and to use renewable energy sources.

It is also possible that technology advances will ameliorate some of these trends by making power plant and vehicle emissions cleaner, making renewable energy sources more available and affordable, and making buildings and appliances more energy efficient. It is also possible, but not necessarily likely, that the region's industries could benefit from federal research investments and growing market demand in all of these categories, creating new growth drivers for the region.

What are the implications for the 2030 Group's agenda?

The regional impact of the energy and environment policies is unclear because they are still under development. In response to these trends, 2030 Group strategies may include:

- Determine the priority issues among the energy/environmental plans under development and establish and communicate the Group's positions to the organizations shaping these policies.