APPENDIX A.
Definition of Terms

Appendix A provides explanations and definitions useful to understanding the 2017 Disparity Study. The following definitions are only relevant in the context of this report.

A&E. "A&E" refers to architecture and engineering (i.e., "A&E contracts").

Anecdotal evidence. Anecdotal evidence includes personal accounts and perceptions of incidents, including any incidents of discrimination, told from each individual interviewee's or participant's perspective.

Availability analysis. The availability analysis examines the number of minority-, women-owned and majority-owned businesses ready, willing, and able to perform work in the construction, architecture and engineering, and information technology industries in the Atlanta Metropolitan Area.

"Availability" is often expressed as the percentage of contract dollars that might be expected to go to minority- or women-owned firms based on analysis of the specific type, location, size and timing of each APS prime contract and subcontract and the relative number of minority- and women-owned firms available for that work.

Business. A business is a for-profit enterprise, including all of its establishments (synonymous with "firm" and "company").

Business establishment. A business establishment (or simply, "establishment") is a place of business with an address and working phone number. One business can have many business establishments.

Business listing. A business listing is a record in the Dun & Bradstreet (D&B) database (or other database) of business information. A D&B record is a "listing" until the study team determines it to be an actual business establishment with a working phone number.

Contract. A contract is a legally binding agreement between the seller of goods or services and a buyer.

Contract element. A contract element is either a prime contract or subcontract that the study team included in its analyses.

Consultant. A consultant is a business performing professional services contracts.

Contractor. A contractor is a business performing construction contracts.

Controlled. Controlled means exercising management and executive authority for a business.

Disadvantaged Business Enterprise (DBE). A small business that is 51 percent or more owned and controlled by one or more individuals who are both socially and economically disadvantaged according to the guidelines in the Federal DBE Program (49 CFR Part 26). Members of certain racial and ethnic groups identified under "minority-owned business enterprise" in this appendix may meet the presumption of social and economic disadvantage. Women are also presumed to be socially and economically disadvantaged. Examination of economic disadvantage also includes investigating the three-year average gross revenues and the business owner's personal net worth (at the time of this report, a maximum of $1.32 million excluding equity in the business and primary personal residence).

Some minority- and women-owned businesses do not qualify as DBEs because of gross revenue or net worth limits.

A business owned by a non-minority male may also be certified as a DBE on a case-by-case basis if the enterprise meets its burden to show it is owned and controlled by one or more socially and economically disadvantaged individuals according to the requirements in 49 CFR Part 26.

Disparity. A disparity is an inequality, difference, or gap between an actual outcome and a reference point or benchmark. For example, a difference between an outcome for one racial or ethnic group and an outcome for non-minorities may constitute a disparity.

Disparity analysis. A disparity analysis compares actual outcomes with what might be expected based on other data. Analysis of whether there is a "disparity" between the utilization and availability of minority- and women-owned businesses is one tool used to examine whether there is evidence consistent with discrimination against such businesses.

Disparity index. A disparity index is a measure of the relative difference between an outcome, such as percentage of contract dollars received by a group, and a corresponding benchmark, such as the percentage of contract dollars that might be expected given the relative availability of that group for those contracts. In this example, it is calculated by dividing percent utilization (numerator) by percent availability (denominator) and then multiplying the result by 100. A disparity index of 100 indicates "parity" or utilization "on par" with availability. Disparity index figures closer to 0 indicate larger disparities between utilization and availability. For example, the disparity index would be "50" if the utilization of a particular group was 5 percent of contract dollars and its availability was 10 percent.

Dun & Bradstreet (D&B). D&B is the leading global provider of lists of business establishments and other business information (see www.dnb.com). Hoover's is the D&B company that provides these lists. Obtaining a DUNS number and being listed by D&B is free to listed companies; it does not require companies to pay to be listed in its database.

Employer firms. Employer firms are firms with paid employees other than the business owner and family members.

Engineering-related services. For purposes of this study, services such as surveying, transportation planning, environmental consulting, construction management and certain related professional services.

Enterprise. An enterprise is an economic unit that is a for-profit business or business establishment, not-for-profit organization or public sector organization.

Establishment. See "business establishment."

Federal Disadvantaged Business Enterprise (DBE) Program. Federal DBE Program refers to the Disadvantaged Business Enterprise Program established by the United States Department of Transportation after enactment of the Transportation Equity Act for the 21st Century (TEA-21) as amended in 1998. The regulations for the Federal DBE Program are set forth in 49 CFR Part 26.

Firm. See "business."

Industry. An industry is a broad classification for businesses providing related goods or services.

Majority-owned business. A majority-owned business is a for-profit business that is not owned and controlled by minorities or women (see definition of "minorities" below).

MBE. Minority-owned business enterprise. See minority-owned business.

Minorities. Minorities are individuals who belong to one or more of the racial/ethnic groups identified in the federal regulations in 49 CFR Section 26.5:

- Black Americans (or "African Americans" in this study), which include persons having origins in any of the black racial groups of Africa.
- Hispanic Americans, which include persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race.
- Native Americans, which include persons who are American Indians, Eskimos, Aleuts or Native Hawaiians.
- Asian Americans, which include persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), Republic of the Northern Marianas Islands, Macao, Fiji, Tonga, Kiribati, Tuvalu, Nauru, Federated States of Micronesia or Hong Kong. Asian Americans also include persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka.

Minority-owned business (MBE). An MBE is a business that is at least 51 percent owned and controlled by one or more individuals that belong to a minority group. Minority groups in this study are those listed in 49 CFR Section 26.5. For purposes of this study, a business need not be certified as such to be counted as a minority-owned business. Businesses owned by minority women are also counted as MBEs in this study (where that information is available). In this study, "MBE-certified businesses" are those that have been certified as a minority-owned company.

North American Industry Classification System (NAICS) codes. NAICS codes identify the primary line of business of a business enterprise. See http://www.census.gov/epcd/www/naics.html.

Non-DBEs. Non-DBEs are firms that are not certified as DBEs, regardless of the race/ethnicity or gender of the owner.

Non-response bias. Non-response bias occurs when the observed responses to a survey question differ from what would have been obtained if all individuals in a population, including non-respondents, had answered the question.

Owned. Owned indicates at least 51 percent ownership of a company. For example, a "minority-owned" business is at least 51 percent owned by one or more minorities.

Prime consultant. A prime consultant is a professional services firm that performs a prime contract for an end user, such as APS.

Prime contract. A prime contract is a contract between a prime contractor or a prime consultant and the project owner, such as APS.

Prime contractor. A prime contractor is a construction firm that performs a prime contract for an end user, such as APS.

Project. A project refers to an APS construction and/or professional services endeavor. A project could include one or multiple prime contracts and corresponding subcontracts.

Race-and gender-conscious measures. Race- and gender-conscious measures are programs in which businesses owned by some minority groups or women may participate but majority-owned firms typically may not. An MBE/WBE contract goal is one example of a race- and gender-conscious measure.

Note that the term is a shortened version of "race-, ethnicity-, and gender-conscious measures." For ease of communication, the study team has truncated the term to "race- and gender-conscious measures."

Race- and gender-neutral measures. Race- and gender-neutral measures apply to businesses regardless of the race/ethnicity or gender of firm ownership. Race- and gender-neutral measures may include assistance in overcoming bonding and financing obstacles, simplifying bidding procedures, providing technical assistance, establishing programs to assist start-up firms, and other methods open to all businesses or any disadvantaged business regardless of race or gender of ownership. A broader list of examples can be found in 49 CFR Section 26.51(b).

Note that the term is more accurately "race, ethnicity, and gender-neutral" measures. However, for ease of communication, the study team has shortened the term to "race- and gender-neutral measures."

Relevant geographic market area. The relevant geographic market area is the geographic area in which the businesses receiving most APS contracting dollars are located. The relevant geographic market area is also referred to as the "local marketplace." Case law related to race- and gender-conscious programs requires disparity analyses to focus on the "relevant geographic market area." [1]

Remedial measure. A remedial measure, sometimes shortened to "remedy," is a program designed to address barriers to full participation of minorities or women, or minority- or women-owned firms.

SBA 8(a). SBA 8(a) is a U.S. Small business Administration business assistance program for small disadvantaged businesses owned and controlled by at least 51 percent socially and economically disadvantaged individuals.

Small business. A small business is a business with low revenues or size (based on revenue or number of employees) relative to other businesses in the industry. "Small business" does not necessarily mean that the business is certified as such.

Small Business Enterprise (SBE). A firm certified as a small business according to the size criteria of the certifying agency.

Small Business Administration (SBA). The SBA refers to the United States Small Business Administration, which is an independent agency of the United States government that assists small businesses.

Statistically significant difference. A statistically significant difference refers to a quantitative difference for which there is a high probability that random chance can be rejected as an explanation for the difference. This has applications when analyzing differences based on sample data such as most U.S. Census datasets (could chance in the sampling process for the data explain the difference?), or when simulating an outcome to determine if it can be replicated through chance. Often a 95 percent confidence level is applied as a standard for when chance can reasonably be rejected as a cause for a difference.

Subconsultant. A subconsultant is a professional services firm that performs services for a prime consultant as part of the prime consultant's contract for a customer such as APS.

Subcontract. A subcontract is a contract between a prime contractor or prime consultant and another business selling goods or services to the prime contractor or prime consultant as part of the prime contractor's contract for a customer such as APS.

Subcontract goals program. A program in which a public agency sets a percent goal for participation of DBEs, MBE/WBEs, ESBs, small businesses or another group on a contract. These programs typically require that a bidder either meet the percentage goal with members of the group or show good faith efforts to do so as part of its bid or proposal.

Subcontractor. A subcontractor is a construction firm that performs services for a prime contractor as part of a larger project.

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[1] *See*, e.g., *Croson*, 448 U.S. at 509; 49 CFR Section 26.35; *Rothe*, 545 F.3d at 1041-1042; *N. Contracting*, 473 F.3d at 718, 722-23; *Western States Paving*, 407 F.3d at 995.

Supplier. A supplier is a firm that sells supplies to a prime contractor as part of a larger project (or in some cases sells supplies directly to APS).

Utilization. Utilization refers to the percentage of total contracting dollars of a particular type of work going to a specific group of businesses (for example, DBEs).

WBE. Woman-owned business enterprise. See women-owned business.

Women-owned business (WBE). A WBE is a business that is at least 51 percent owned and controlled by one or more individuals that are non-minority women. A business need not be certified as such to be included as a WBE in this study. For this study, businesses owned and controlled by minority women are counted as minority-owned businesses. In this study, a "WBE-certified businesses" is one certified as a woman-owned firm.

APPENDIX B.
Utilization Data Collection

Keen Independent compiled data about SPLOST-related procurements made by Atlanta Public Schools (APS). The study team analyzed both prime contractors and subcontractors on those procurements.

Combined, Keen Independent examined $385 million worth of contract and procurement spending. From these data, the study team determined the geographic market area and subindustries representing the majority of expenses related to APS property development. Keen Independent also calculated the percentage of payments that went to minority-, women- and majority-owned businesses. The utilization analysis focused on construction (including construction materials), professional services and other services procurements during the study period.

Appendix B describes Keen Independent's utilization data collection efforts in five parts:

A. Atlanta Public Schools procurements examined;
B. Types of contracts not included in the data analyses;
C. Compilation of data on other school-related construction in the Atlanta area;
D. Steps to the utilization analysis; and
E. APS review.

A. Atlanta Public Schools Procurements Examined

Keen Independent compiled information on APS construction, professional services and other services prime contracts and subcontracts, as well as on construction-related goods procurements.

Study period for the APS data examined. APS decided to focus on SPLOST-related procurements for this study. The most recent SPLOST cycle started in July 2012. In order to capture at least five years of contract data (which is typical of disparity studies), the study team decided to include the last year of the previous SPLOST cycle, for a full study period of July 1, 2011 to June 30, 2016.

Data sources used. APS provided Keen Independent with three main information sources: copies of all contracts awarded during the study period, invoices, or "pay applications," and subcontractor utilization reports for each contract, submitted by primes to APS. The invoices submitted by primes included comprehensive lists of subcontractors on each project, as well as payments made by primes to subcontractors during the study period.

Contract information provided. Keen Independent reviewed the contract information included, for the reporting period of July 2011 to June 2016.

The contracts provided included the following information:

- Project/school description;
- Contract amount;
- Execution date;
- Prime contractor name;
- Prime contractor address; and
- Subcontractor name, role and address (when applicable).

Prime contractor payment information from pay applications. In addition, APS assembled payment information for each contract awarded during the study period. The information included payment information for all prime contractors as well as subcontractors. Overall, the study team examined $385 million in APS payments for the study period.

The pay applications included the following relevant information for contracts awarded from July 2011 through June 2016:

- Prime contractor name;
- Prime contractor address;
- Prime contractor vendor ID;
- Project/school description;
- Account and sub-account;
- Purchase order/contract number;
- Pay application/invoice date;
- Current pay application/invoice amount;
- Total original purchase order/contract amount;
- Total amended purchase order/contract amount;
- Amount previously paid to prime contractor; and
- Remaining balance on the purchase order/contract.

Subcontractor payment information from subcontractor utilization reports. In addition, APS assembled payment information for each prime contractor and project, showing all subcontractors utilized on each project and payments made. Specific information included:

- Project/school description;
- Prime contractor name;
- Prime contractor address;
- Prime contractor phone number;
- Prime contractor pay application/invoice number;
- Subcontractor name(s);
- Subcontractor(s) description of work;
- Subcontract amount(s);
- Current subcontractor(s) payment request(s); and
- Subcontractor payments made to date.

B. Types of Contracts Not Included in the APS-Related Data Analyses

There were additional SPLOST-related purchases amounting to approximately $200,000 that Keen Independent identified for the study period. These were not analyzed as they were payments related to IT hardware purchased from national markets and typically excluded from disparity analyses.

C. Compilation of Data for Other School-related Construction in the Atlanta Area

Keen Independent also analyzed the utilization of minority- and women-owned construction firms as prime contractors on non-APS school construction projects in the Atlanta area.

Keen Independent purchased electronic Dodge Reports data from Dodge Data & Analytics. The study team examined Dodge Reports data for school construction projects within the Atlanta Metropolitan Area that had start dates from January 2014 to December 2016 (excluding APS construction projects). These data identify the general contractor/construction manager for each project as well as information on the value of the project.

For most of these projects, the Dodge Reports data also identify the design/A&E firm. Data concerning dollars for the design work were not provided however. Therefore, the utilization analysis of design contracts was based on the number of contracts rather than dollars.

Keen Independent examined 273 non-APS school construction contracts for a value of $1.9 billion.

The Dodge Reports data also provided information for 285 design contracts involved in these school projects.

D. Steps to the Utilization Analysis

For each firm identified as working on APS contracts, as well as for firms that were the prime contractors or design firms on school projects in the Atlanta Metropolitan Area identified through Dodge Reports data, Keen Independent attempted to collect the race, ethnicity and gender of the business owner. Sources of information to determine whether firms were owned by minorities or women (including race/ethnicity) included:

- Study team telephone interviews with firm owners and managers (attempted with each utilized firm as well as with firms identified through Dodge Reports data);
- Study team telephone interviews with Atlanta area firm owners and managers (attempted as part of the availability survey);
- City of Atlanta MFBE certification data;
- GDOT DBE certification data;
- Data compiled as part of previous BBC and Keen Independent studies in the area; and
- Additional Keen Independent phone interviews and online research.

E. APS Review

APS staff reviewed Keen Independent utilization data for contracts awarded by APS during several stages of the study process. Keen Independent reviewed and incorporated APS feedback throughout the study process.

APPENDIX C.
Availability Analysis

Keen Independent analyzed the availability of minority- and women-owned business enterprises (MBE/WBEs) that are ready, willing and able to perform on Atlanta Public Schools (APS) prime contracts and subcontracts. The study team collected necessary data concerning availability for APS-related work through a telephone survey of Atlanta area businesses performing certain types of work.

Because Keen Independent was surveying Atlanta metropolitan area construction, professional services and other firms at the same time for both APS and the Atlanta Housing Authority, the availability survey combined questions for APS and AHA, as appropriate, for subindustries that related to work on both school and housing authorities contracts and subcontracts (construction management and electrical work, for example).

Appendix C describes the study team's availability analysis in eight parts:

A. Purpose of the availability analysis;

B. Definitions of MBEs, WBEs and majority-owned businesses;

C. General approach to collecting availability information;

D. Development of the interview instruments;

E. Businesses included in the availability database;

F. MBE/WBE availability calculations on a contract-by-contract basis;

G. Dollar-weighted availability results; and

H. Additional considerations related to measuring availability.

A. Purpose of the Availability Analysis

The 2017 Disparity Study compares APS' utilization of minority- and women-owned firms against an availability benchmark. MBE/WBE "availability" is defined as the percentage of dollars that might be expected to go to minority- and women-owned businesses based on their availability for specific types and sizes of APS contracts.

Comparisons between utilization and availability identify whether any MBE/WBE groups were underutilized based on their availability for APS work.

The balance of Appendix C explains each step in compiling availability data and determining the availability benchmarks, beginning with definitions of terms.

B. Definitions of MBEs, WBEs and Majority-owned Businesses

The following definitions of terms based on ownership and certification status are useful background to the availability analysis.

MBE/WBEs. The availability benchmark and the base figure analyses use the same definitions of minority- and women-owned business enterprises (MBE/WBEs), as do other components of the Disparity Study. This includes MBE/WBEs that are certified by other state or local agencies, such as the City of Atlanta or Georgia DOT, and firms that indicate they are minority- or women-owned but are not certified as such.

Race, ethnic and gender groups. The study team separately examined utilization, availability and disparity results for businesses owned by:

- African Americans;
- Asian Americans;
- Hispanic Americans;
- Native Americans; and
- Non-Hispanic white women.

All other businesses are "majority-owned businesses."

Firms owned by minority women. Businesses owned by minority women are included with the results for each minority group. The term "WBEs" in this report refers to non-Hispanic white women-owned businesses. This definition of WBEs gives APS information to answer questions that may arise pertaining to the utilization of non-Hispanic white women-owned businesses. Keen Independent's approach is consistent with court decisions that have considered this issue.

All MBE/WBEs, not only certified firms. When availability results are used as a benchmark in the disparity analysis, all minority- and women-owned firms are counted as such whether or not they are certified as MBEs or DBEs. Analyzing the availability and utilization of minority- and women-owned firms regardless of certification status allows one to assess whether there are disparities affecting all MBE/WBEs and not just certified firms. Businesses may be discriminated against because of the race or gender of their owners regardless of whether they have successfully applied for certification.

The courts that have reviewed disparity studies have accepted analyses based on the race, ethnicity and gender of business ownership rather than on certification status.

Majority-owned businesses. Majority-owned businesses are businesses that are not owned by minorities or women (i.e., businesses owned by non-Hispanic white males). In the utilization and availability analyses, the study team coded each business as minority-, women- or majority-owned.

C. General Approach to Collecting Availability Information

Keen Independent's availability analysis focused on firms with Atlanta metro area locations that work in subindustries related to APS construction, architecture and engineering (A&E), information technology (IT) contracts and other professional services. We collectively refer to A&E, IT and other professional services contracts as "professional services."

Based on a review of APS prime contracts and subcontracts during the study period, the study team identified specific subindustries for inclusion in the availability analysis. Keen Independent contacted businesses within those subindustries by telephone to collect information about their availability for specific types and sizes of APS prime contracts and subcontracts.

Keen Independent's method of examining availability is sometimes referred to as "custom census" and has been accepted in federal court. Figure C-1 summarizes characteristics of Keen Independent's custom census approach to examining availability.

Figure C-1.
Summary of the strengths of Keen Independent's "custom census" approach

Federal courts have reviewed and upheld "custom census" approaches to examining availability. Compared with some other previous court-reviewed custom census approaches, Keen Independent added several layers of screening to determine which businesses are potentially available for APS contracts.

For example, the Keen Independent analysis included discussions with businesses about interest in APS work and contract roles — items not included in some of the previous court-reviewed custom census approaches. For construction, professional services and IT businesses, Keen Independent also analyzed the sizes of contracts and subcontracts on which businesses have bid on or performed in the past (referred to as "bid capacity" in this analysis).

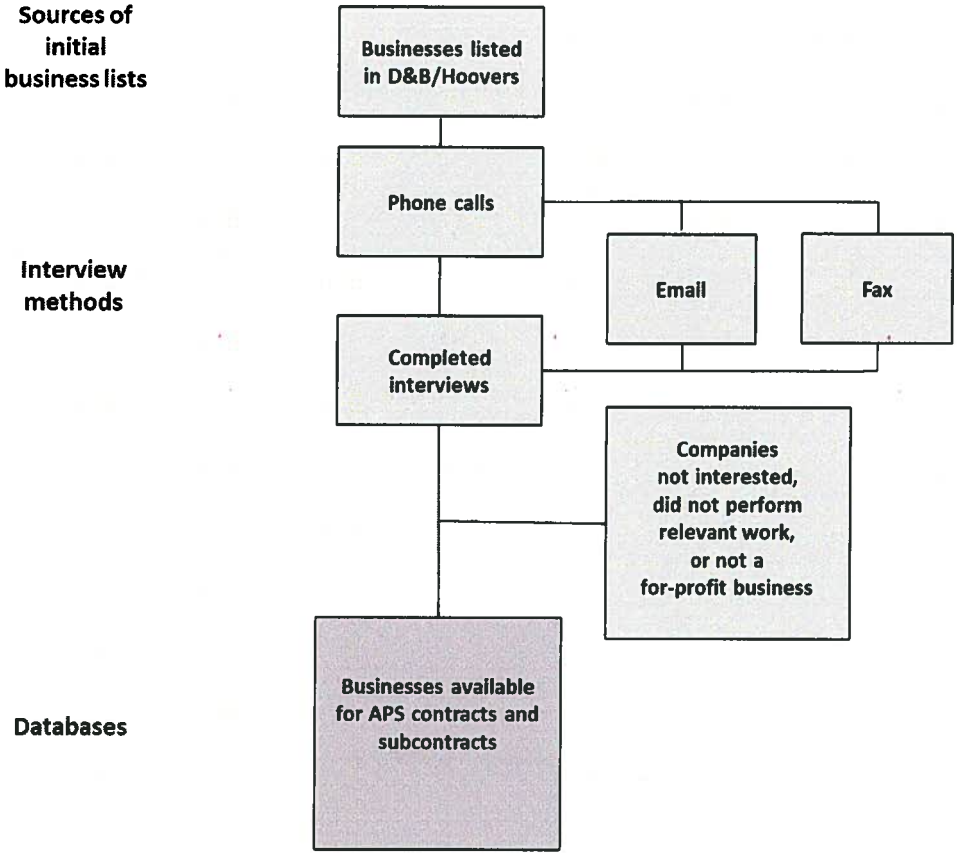
Overview of availability interviews. The study team conducted telephone interviews with business owners and managers to identify businesses that are potentially available for APS prime contracts and subcontracts.[1] Figure C-2 summarizes the process for identifying businesses, contacting them and completing the interviews.

Keen Independent began by compiling lists of business establishments that Dun & Bradstreet/Hoovers identified in certain subindustries in the Atlanta area.[2]

[1] The study team offered business representates the option of completing interviews via fax or email if they preferred not to complete interviews via telephone.

[2] D&B's Hoover's database is accepted as the most comprehensive and complete source of business listings in the nation. Keen Independent collected information about all business establishments listed under 8-digit work specialization codes (as developed by D&B) that were most related to the contracts that APS awarded during the study period.

Figure C-2.
Availability interview process



Dun & Bradstreet Hoover's database. Dun & Bradstreet's Hoover's affiliate maintains the largest commercially-available database of businesses in the United States.

Keen Independent determined the types of work involved in APS contract elements by reviewing prime contract and subcontract dollars that went to different types of businesses during the study period. D&B classifies types of work by 8-digit work specialization codes.[3] Figure C-3 on the following page identifies the work specialization codes the study team determined were the most related to the APS contract dollars in the study.

[3] D&B has developed 8-digit industry codes to provide more precise definitions of firm specializations than the 4-digit SIC codes or the NAICS codes that the federal government has prepared.

Figure C-3.
D&B 8-digit codes for availability list source

Figure C-3. D&B 8-digit codes for availability list source			
Code	Description	Code	Description
17110300	Sprinkler Contractors	52110506	Sand and gravel
17110301	Fire Sprinkler System Installation	52110507	Tile, ceramic
17110302	Irrigation Sprinkler System Installation	52310000	Paint, glass, and wallpaper stores
73810105	Security guard service	52310100	Glass
87489905	Environmental consultant	52310101	Glass, leaded or stained
7110000	Soil preparation services	52310200	Paint and painting supplies
7119906	Soil testing services	52310201	Paint
15220100	Hotel/motel and multi-family home construction	52310202	Paint brushes, rollers, sprayers and other supplies
15220101	Apartment building construction	52310300	Wallcoverings
15220102	Co-op construction	52310301	Wallpaper
15220103	Condominium construction	17420202	Exterior insulation and finish (EIFS) applicator
15220106	Multi-family dwelling construction, nec	17420203	Insulation, buildings
15220107	Multi-family dwellings, new construction	17710000	Concrete work
15220200	Hotel/motel and multi-family home renovation and remodeling	17710100	Stucco, gunite, and grouting contractors
15220201	Remodeling, multi-family dwellings	17710101	Exterior concrete stucco contractor
15310000	Operative builders	17710102	Grouting work
15319901	Condominium developers	17710103	Gunite contractor
15319902	Cooperative apartment developers	17719901	Concrete pumping
15319903	Speculative builder, multi-family dwellings	17719904	Foundation and footing contractor
15319905	Townhouse developers	30890000	Plastics products, nec
15420400	Specialized public building contractors	30890300	Plastics hardware and building products
15420406	School building construction	30890304	Doors, folding: plastics or plastics coated fabric
15429905	Stadium construction	30890307	Fences, gates, and accessories: plastics
16230000	Water, sewer, and utility lines	30890308	Fittings for pipe, plastics
16230300	Water and sewer line construction	30890313	Panels, building: plastics, nec
16230302	Sewer line construction	30890314	Reinforcing mesh, plastics
16230303	Water main construction	30890320	Window frames and sash, plastics
16239903	Pipe laying construction	30890322	Windows, plastics
16239906	Underground utilities contractor	30890324	Fiberglass doors
16290400	Land preparation construction	32510100	Structural brick and blocks
16290401	Land leveling	32720702	Building materials, except block or brick: concrete
16290402	Land reclamation	33170000	Steel pipe and tubes
16290403	Rock removal	73610000	Employment agencies
17110000	Plumbing, heating, air-conditioning	73610102	Labor contractors (employment agency)
17110100	Boiler and furnace contractors	73630102	Manpower pools
17110101	Boiler maintenance contractor	73630103	Temporary help service
17110103	Heating systems repair and maintenance	73710300	Computer software development and applications
17110104	Hydronics heating contractor	73710301	Computer software development
17110200	Plumbing contractors	73710302	Software programming applications
17110403	Solar energy contractor	73729903	Educational computer software
17110404	Ventilation and duct work contractor	73740000	Data processing and preparation
17110405	Warm air heating and air conditioning contractor	73740100	Computer processing services
17119901	Refrigeration contractor	73740101	Calculating service (computer)
17310000	Electrical work	73740102	Computer graphics service
17310300	Communications specialization	73749901	Data entry service
17310301	Cable television installation	73749902	Data processing service
17310302	Fiber optic cable installation	73790000	Computer related services, nec
17310303	Sound equipment specialization	73790200	Computer related consulting services
17310304	Telephone and telephone equipment installation	73790203	Online services technology consultants
17310305	Voice, data, and video wiring contractor	87110000	Engineering services
17319902	Computer installation	87110100	Sanitary engineers
17319903	General electrical contractor	87110400	Construction and civil engineering
17319904	Lighting contractor	87110401	Building construction consultant
17420000	Plastering, drywall, and insulation	87110403	Heating and ventilation engineering
17420100	Plaster and drywall work	87110404	Structural engineering
17420101	Drywall	87119901	Acoustical engineering
17420104	Plastering, plain or ornamental	87119903	Consulting engineer
17420105	Stucco work, interior	87119905	Electrical or electronic engineering
17420200	Acoustical and insulation work	87119906	Energy conservation engineering
17420201	Acoustical and ceiling work	87119907	Fire protection engineering
52110500	Masonry materials and supplies	87119909	Professional engineer
52110501	Brick	87120000	Architectural services
52110502	Cement	87120100	Architectural engineering
52110503	Concrete and cinder block	87120101	Architectural engineering
52110504	Lime and plaster	87419902	Construction management
52110505	Paving stones	87420406	Real estate consultant

Keen Independent obtained a list of firms from the D&B Hoover's database within relevant work codes that had locations in the Atlanta area. D&B provided phone numbers for these businesses. Keen Independent obtained nearly 26,000 business listings from this source (this count includes duplicate records and firms purchased for the AHA availability analysis that might not do the types of work involved in APS procurement). Keen Independent did not draw a sample of those firms for the availability analysis; rather, the study team attempted to contact each business identified through telephone interviews and other methods described below.

Telephone interviews. Figure C-2 outlines the process Keen Independent used to complete interviews with businesses possibly available for APS work.

- The study team contacted firms by telephone to ask them to participate in the interviews (identifying the APS as the organization requesting the information[4]). Firms indicating over the phone that they were not interested or not involved in APS work were not asked to complete the other interview questions. Interviews began in January 2017 and were completed at the end of February 2017. Keen Independent contracted with Customer Research International (CRI), a telephone survey research firm, to complete this work. CRI has extensive experience performing similar interviews for disparity studies throughout the country.

- Some firms completed interviews when first contacted. For firms not immediately responding, the study team executed intensive follow-up over many weeks.

- CRI identified and attempted to interview an available company representative such as the owner, manager or other key official who could provide accurate and detailed responses to the questions included in the interview.

- Firm owners could also request that questionnaires be faxed or emailed to them. Eight firms returned completed questionnaires via fax/email.

Screening of firms for the availability database. The study team asked business owners and managers several questions concerning the types of work that their companies performed and their qualifications and interest in working on contracts for the APS, among other topics. Keen Independent considered businesses to be potentially available for APS prime contracts or subcontracts if they reported possessing all of the following characteristics:

a. Being a private business (as opposed to a public agency or not-for-profit organization);

b. Providing services relevant to APS; and

c. Reporting qualifications and interest in work for APS.

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[4] The study team decided to launch the availability survey for APS jointly with another Atlanta public agency, considering the overlap in firms on each agency's list. By doing this jointly, the team anticipated a higher participation rate.

D. Development of the Interview Instrument

The study team developed a general interview instrument, which was then tailored for each industry in the study. Individual surveys were developed for each industry so that firms were only asked questions that were relevant to their area of work. A total of three instruments were developed:

- Construction and construction management;
- Architecture, engineering, environmental consulting and design-related professional services; and
- IT-related professional services.

APS staff reviewed each of the draft interview instruments. The availability interview instrument for construction firms can be found at the end of this appendix.

Interview structure. The availability interview included eight sections. The study team did not know the race, ethnicity or gender of the business owner when calling a business establishment. Obtaining that information was a key component of the interview.

Areas of interview questions included:

- **Identification of purpose.** The interviews began by identifying the APS as the interview sponsor and describing the purpose of the study.
- **Verification of correct business name.** CRI confirmed that the business reached was, in fact, the business sought out.
- **Contact information.** CRI then collected complete contact information for the establishment and the individual who completed the interview.
- **Verification of work related to APS projects.** All firms were asked to verify their main line of business. Because construction and professional services firms often work in multiple, inter-related areas, they were asked about the specific types of work they perform related to commercial or public sector projects. For example, a construction firm's main line of business may be excavation, but they also do trucking.
- **Verification of for-profit business status.** The survey then asked whether the organization was a for-profit business as opposed to a government or not-for-profit entity. Interviewers continued the interview with businesses that responded "yes" to that question.
- **Identification of main lines of business.** Businesses chose from a list of work types that their firm performed. In addition to choosing all areas that the firms did work, the study team asked businesses to briefly describe their main line of business as an open-ended question. Keen Independent then coded the responses into standardized work types.

- **Sole location or multiple locations.** The interviewer asked business owners or managers if their businesses had other locations and whether their establishments were affiliates or subsidiaries of other firms. (Keen Independent combined responses from multiple locations into a single record for multi-establishment firms.)

- **Past bids or work with government agencies and private sector organizations.** The survey then asked about bids and work on past government and private sector contracts. The questions were asked in connection with both prime contracts and subcontracts.

- **Qualifications and interest in future public work.** The interviewer asked about businesses' qualifications and interest in future work with APS in connection with both prime contracts and subcontracts.

- **Largest contracts.** The study team asked businesses to identify the value of the largest contract or subcontract on which they had bid or had been awarded during the past five years.

- **Ownership.** Businesses were asked if at least 51 percent of the firm was owned and controlled by women and/or minorities. If businesses indicated that they were minority-owned, they were also asked about the race and ethnicity of owners. The study team reviewed reported ownership against other available data sources, such as directories of certified firms. When respondents refused to answer or provided unclear information about the ownership information for a business, Keen Independent conducted additional research (e.g., through City of Atlanta directory, GDOT UCP directory, past disparity studies, supplementary phone calls and other publicly available information).

- **Business background.** The study team asked businesses to identify the approximate year in which they were established. The interviewer asked several questions about the size of businesses in terms of their revenues and number of employees. For businesses with multiple locations, this section also asked about their revenues and number of employees across all locations.

- **Potential barriers in the marketplace.** Establishments were asked a series of questions concerning general insights about the marketplace and APS contracting practices including obtaining loans, bonding and insurance (when applicable). The interview also included an open-ended question asking for any additional barriers or general thoughts about doing work in the Atlanta area. In addition, the interview included a question asking whether interviewees would be willing to participate in a follow-up interview about marketplace conditions.

Establishments that the study team successfully contacted. Figure C-4 presents the disposition of the businesses the study team attempted to contact for availability interviews.

Note that the following analysis is based on business counts after Keen Independent removed duplicate listings (beginning list of 14,104 unique businesses).

Because results are based on a simple count of firms with no analysis of availability for specific APS contracts, they only reflect the first step in the availability analysis.

Figure C-4.
Disposition of attempts to interview business establishments

Note:
Study team made at least five attempts to complete an interview with each establishment.

Source:
Keen Independent from 2017 availability survey.

	Number of firms	Percent of business listings
Beginning list (unique businesses)	**14,104**	
Less non-working phone numbers	1,310	
Less wrong number	111	
Firms with working phone numbers	**12,683**	**100.0 %**
Less no answer	6,696	
Less could not reach responsible staff member	461	
Less could not continue in English or Spanish	27	
Less unreturned fax/email	342	
Less said they already completed the survey but didn't	14	
Firms successfully contacted	**5,143**	**40.6 %**

Non-working or wrong phone numbers. Some of the business listings that the study team attempted to contact were:

- Non-working phone numbers (1,310); or
- Wrong numbers for the desired businesses (111).

Some non-working phone and wrong numbers reflected business establishments that closed, were sold or changed their names and phone numbers between the time that a source listed them and the time that the study team attempted to contact them.

Working phone numbers. As shown in Figure C-4, there were 12,683 businesses with working phone numbers that the study team attempted to contact. For various reasons, the study team was unable to contact some of those businesses:

- **No answer.** Some businesses could not be reached after at least five attempts at different times of the day and on different days of the week (6,696 establishments).
- **Could not reach responsible staff member.** For a small number of businesses (461), a responsible staff person could not be reached after repeated attempts.
- **Could not continue in English or Spanish.** For a very small number of businesses (27), a responsible staff person speaking English or Spanish could not be reached after repeated attempts.

- **Unreturned fax/email.** The study team sent faxes or emailed the availability questionnaires upon request. There were 342 businesses that requested such surveys but did not return them.
- **Said they already filled out the survey but didn't.** The study team noted 14 firms who claimed to have filled out the survey but didn't.

After taking those unsuccessful attempts into account, the study team was able to successfully contact 5,143 businesses, or 40.6 percent of those with working phone numbers.

Establishments included in the availability database. Figure C-5 presents the disposition of the 5,143 businesses the study team successfully contacted and how that number resulted in the 952 businesses the study team included in the availability database.

Figure C-5.
Disposition of successfully contacted businesses

Source:
Keen Independent from 2017 availability survey.

	Number of firms
Firms successfully contacted	**5,143**
Less businesses not interested	2,062
Less no longer in business	327
Firms that completed interviews about business characteristics	**2,754**
Less unrelated work	1,071
Less not a for-profit business	65
Less residence, not a business	656
Less duplicate responses	10
Total firms included in availability database	**952**

Establishments not interested in discussing availability for APS work. Of the 5,143 businesses that the study team successfully contacted, 2,062 were not interested in discussing their availability for APS work. This typically indicates that firms are not available for APS work.

Establishments no longer in business. 327 respondents stated that they were no longer in business, thus not available for APS work.

Businesses excluded from the availability database. Many firms completing interviews were excluded from the final availability database because they indicated that they did not perform work related to APS contracting or reported that they were not a for-profit business:

- Keen Independent excluded 1,071 businesses that indicated that they did not perform work related to APS contracting.
- Of the completed interviews, 65 indicated that they were not a for-profit business (including non-profits, government agencies). Interviews ended when respondents reported that their establishments were not for-profit businesses.
- 656 respondents interviewed were called on a residential or cell phone, not a business phone.

- Of the completed interviews, 10 were conducted with duplicate firms. Duplicate answers were compared and the data combined.

After those final screening steps, the interview effort produced a database of 952 businesses potentially available for APS work.

Coding responses from multi-location businesses. As described above, there were multiple responses from some firms. Responses from different locations of the same business were combined into a single, summary data record after reviewing the multiple responses.

E. Businesses Included in the Availability Database

After completing interviews with approximately 2,800 Atlanta area businesses, the study team developed a database of information about the 952 businesses that are potentially available for APS work. The study team used the availability database to produce availability benchmarks to determine whether there were any disparities in APS utilization of MBE/WBEs during the study period.

Data from the availability interviews allowed Keen Independent to develop a representative depiction of businesses that are qualified and interested in the highest dollar volume areas of APS construction, professional services and IT contracts, but it should not be considered an exhaustive list of every business that could potentially participate in APS contracts (and subcontracts).

Figure C-6 presents the number of businesses that the study team included in the availability database for each racial/ethnic and gender group. The study team's research identified 952 businesses reporting that they were available for specific types of contracts that the APS awarded during the study period. Of those businesses 451 (47.4%) were MBEs or WBEs.

Figure C-6.
Number of businesses included in the availability database

Note:
Numbers rounded to nearest tenth of 1 percent. Percentages may not add to totals due to rounding.

Source:
Keen Independent availability analysis.

	Number of firms	Percent of firms
MBE/WBE		
African American-owned	242	25.4 %
Asian American-owned	69	7.2
Hispanic American-owned	35	3.7
Native American-owned	10	1.1
Total MBE	356	37.4 %
WBE (white women-owned)	95	10.0
Total MBE/WBE	451	47.4 %
Majority-owned	501	52.6
Total firms	952	100.0 %

F. MBE/WBE Availability Calculations on a Contract-by-Contract Basis

Keen Independent analyzed information from the availability database to develop dollar-weighted availability estimates for use as a benchmark in the disparity analysis.

- Dollar-weighted availability estimates represent the percentage of APS contract dollars that MBE/WBEs might be expected to receive based on their availability for specific types and sizes of APS prime contracts and subcontracts.

- Keen Independent's approach to calculating availability was a bottom up, contract-by-contract process of "matching" available firms to specific contracts and subcontracts.

Steps to calculating availability. Only a portion of the businesses in the availability database were considered potentially available for APS construction contracts, professional services contracts and other procurements (referred to collectively as "contract elements"). The study team first examined the characteristics of each specific contract element, including type of work, role (prime or sub or materials supplier) contract size and contract date. The study team then identified businesses in the availability database that perform work of that type, size and role. (The process of considering availability did not include purchase size for any goods procurements.)

Figure C-7.
Example of an availability calculation

One of the APS contracts examined was for A&E work on an elementary school (prime contract for $0.5 million). To determine the number of MBE/WBEs and majority-owned firms available for that contract, the study team identified businesses in the availability database that:

a. **Reported qualifications and interest in working on APS contracts;**
b. **Indicated that they performed A&E work; and**
c. **Reported bidding on work of similar or greater size in the past five years.**

There were 80 businesses in the availability database that met those criteria. Of those businesses, 40 were MBEs or WBEs. Therefore, MBE/WBE availability for the subcontract was 50 percent (i.e., 40/80 = 50%).

Steps to the availability calculations. The study team identified the specific characteristics of each of the prime contracts and subcontracts included in the utilization analysis and then took the following steps to calculate availability for each contract element:

1. For each contract element, the study team identified businesses in the availability database that reported that they:
   - Are qualified and interested in performing work for APS in that particular role and perform that specific type of work; and
   - Except for goods firms, had bid on or performed work of that size in the Atlanta area in the past five years (or had done so based on contract data for the study period).

2. For the specific contract element, the study team then counted the number of MBEs (by race/ethnicity), WBEs and majority-owned businesses among all businesses in the availability database that met the criteria specified in Step 1.

3. The study team translated the numeric availability of businesses for the contract element into percentage availability (as described in Figure C-7).

The study team repeated those steps for each contract element examined. The study team multiplied the percentage availability for each contract element by the dollars associated with the contract element, added results across all contract elements, and divided by the total dollars for all contract elements. The result was a dollar-weighted estimate of overall availability of MBE/WBEs and estimates of availability for each MBE/WBE group. Figure C-7 provides an example of how the study team calculated availability for a specific subcontract in the study period.

Special considerations for goods procurements. When calculating availability for a particular type of goods, including construction materials supplies, Keen Independent counted as available all firms supplying those materials that reported qualifications and interest in that work for APS. Bid capacity was not considered in these calculations.

Improvements on a simple "head count" of businesses. Keen Independent used a "custom census" approach to calculating MBE/WBE availability for APS work rather than using a simple "head count" of MBE/WBEs (i.e., simply calculating the percentage of all Atlanta area businesses that are minority- or women-owned). Using a custom census approach typically results in lower availability estimates for MBEs and WBEs than a headcount approach due in large part to Keen Independent's consideration of "bid capacity" in measuring availability and because of dollar-weighting availability results for each contract element (a large prime contract has a greater weight in calculating overall availability than a small subcontract).

There are several important ways in which Keen Independent's custom census approach to measuring availability is more precise than completing a simple head count approach.

Keen Independent's approach accounts for qualifications and interest in APS work. The study team collected information on whether businesses are qualified and interested in working as prime contractors, subcontractors, or both on APS contracts, in addition to the consideration of several other factors related to prime contracts and subcontracts (e.g., contract types and sizes).

Keen Independent's approach accounts for the size of prime contracts and subcontracts. The study team considered the size — in terms of dollar value — of the prime contracts and subcontracts that a business bid on or received in the previous five years (i.e., "bid capacity") when determining whether to count that business as available for a particular contract element.

Keen Independent's approach is consistent with many recent, key court decisions that have found relative capacity measures to be important in measuring availability.

Keen Independent's approach generates dollar-weighted results. Keen Independent examined availability on a contract-by-contract basis and then dollar-weighted the results for different sets of contract elements. Thus, the results of relatively large contract elements contributed more to overall availability estimates than those of relatively small contract elements.

G. Dollar-weighted Availability Results

Keen Independent used the approach described above to estimate the availability of MBE/WBEs and majority-owned businesses for each of the APS contracts and subcontracts examined. Figure C-8 presents overall dollar-weighted availability estimates by MBE/WBE group.

This analysis provided benchmarks for the percentage of APS contract dollars one might expect to go to MBE/WBEs given the current availability of firms to perform specific types and sizes of those prime contracts and subcontracts. The availability analysis considered bid capacity of firms, only counting a company as available for sizes of contracts it had been awarded or had bid on in the local marketplace in the previous five years. For these reasons, the availability percentages in Figure C-8 are somewhat lower than in Figure C-6, which showed the overall counts of firms in the analysis.

Figure C-8 shows the availability benchmarks for construction and professional services and other procurements (combining A&E, IT and other procurements) and total contracts examined in the study. The left-most column presents results for construction contracts. As shown, minority- and women-owned firms might be expected to receive about 35 percent of APS construction contract dollars during the study period. This result combines prime contract and subcontract dollars.

The second column of Figure C-8 provides availability results for professional services contracts and other procurements by race, ethnicity and gender ownership of firm. Minority- and women-owned firms might be expected to receive 40.4 percent of A&E, IT and related contract dollars during the study period after considering the specific types and sizes of prime contracts and subcontracts involved.

The third column of Figure C-8 presents results for all APS contracts studied, including subcontracts. MBE/WBEs might be expected to receive 35.3 percent of APS contract dollars examined in this study. About 31 percent of contract dollars might be expected to go to minority-owned firms and 4.1 percent might go to white women-owned firms, based on the availability analysis. Note that the results for total contracts are similar to those for construction contracts alone because most of the dollars examined in the study were for construction contracts.

Figure C-8.
Percentage of contract dollars that might be expected to go to MBE/WBEs based on availability analysis

	Construction	Professional services	Total
MBE/WBE			
African American-owned	29.2 %	16.0 %	27.8 %
Asian American-owned	1.2	9.2	2.0
Hispanic American-owned	0.7	6.4	1.3
Native American-owned	0.1	0.1	0.1
Total MBE	31.1 %	31.6 %	31.2 %
WBE (white women-owned)	3.6	8.8	4.1
Total MBE/WBE	34.7 %	40.4 %	35.3 %

Source: Keen Independent 2017 availability analysis using APS contracts and 2017 availability data.

H. Additional Considerations Related to Measuring Availability

The study team made several additional considerations related to its approach to measuring availability.

Not providing a count of all businesses available for APS work. The purpose of the availability interviews was to provide precise and representative estimates of the percentage of MBE/WBEs potentially available for APS work. The availability analysis did not provide a comprehensive listing of every business that could be available for APS contracts and subcontracts and should not be used in that way. Federal courts have approved the approach to measuring availability that Keen Independent used in this study.

Not using MBE/WBE directories, prequalification lists or bidders lists. The methodology applied in this study takes a custom census approach to measuring availability and adds several layers of refinement to a simple head count approach. For example, the availability interviews provide data on businesses' qualifications, relative bid capacity and interest in APS work, which allowed the study team to take a more refined approach to measuring availability.

Using D&B lists. Dun & Bradstreet (D&B) was the source of business listings in Keen Independent's availability analysis. Note that D&B does not require firms to pay a fee to be included in its listings — it is completely free to listed firms. D&B provides the most comprehensive private database of business listings in the United States. Even so, the database does not include all establishments operating in the Atlanta area due to the following reasons:

- There can be a lag between formation of a new business and inclusion in D&B listings, meaning that the newest businesses may be underrepresented in the sample frame.
- Although D&B includes home-based businesses, those businesses are more difficult to identify and are thus somewhat less likely than other businesses to be included in D&B listings. Small, home-based businesses are more likely than large businesses to be minority- or women-owned, which again suggests that MBE/WBEs might be underrepresented in the final availability database.

Keen Independent is not able to quantify how much, if any, underrepresentation of MBE/WBEs exists in the final availability database. However, based on its experience in this field, Keen Independent concludes that any such underrepresentation would be minor and would not have a meaningful effect on the availability and disparity analyses presented in this report.

Selection of specific subindustries. Keen Independent identified specific subindustries when compiling business listings from Dun & Bradstreet. D&B provides highly specialized, 8-digit codes to assist in selecting firms within specific specializations. However, there are limitations when choosing specific D&B work specialization codes to define sets of establishments to be interviewed, which leave some businesses off the availability survey contact list.

Non-response bias. An analysis of non-response bias considers whether businesses that were not successfully interviewed are systematically different from those that were successfully interviewed and included in the final data set. There are opportunities for non-response bias in any survey effort. The study team considered the potential for non-response bias due to:

- Research sponsorship; and
- Work specializations.

Research sponsorship. Interviewers introduced themselves by identifying Atlanta Public Schools (and the Atlanta Housing Authority, as explained in more detail at the beginning of this Appendix) as the interview sponsors because businesses may be less likely to answer somewhat sensitive business questions if the interviewer was unable to identify the sponsor.

Work specializations. Businesses in highly mobile fields may be more difficult to reach for availability interviews than businesses more likely to work out of fixed offices (e.g., some professional firms). That assertion suggests that response rates may differ by work specialization. Simply counting all interviewed businesses across work specializations to determine overall MBE/WBE availability would lead to estimates that were biased in favor of businesses that could be easily contacted by telephone.

However, work specialization as a potential source of non-response bias in the availability analysis is minimized because the availability analysis examines businesses within particular work fields before determining an MBE/WBE availability figure. In other words, the potential for those firms to be less likely to complete an interview is less important because the percentage of MBE/WBE availability is calculated within each discipline before being combined with information from other work fields in a dollar-weighted fashion. For example, work specialization would be a greater source of non-response bias if particular subsets of trucking firms were less likely than other subsets to be easily contacted by telephone.

Response reliability. Business owners and managers were asked questions that may be difficult to answer, including questions about revenue and employment.

Keen Independent explored the reliability of interview responses in a number of ways. For example, Keen Independent reviewed data from the availability interviews in light of information from other sources such as the City of Atlanta M/FBE directory and other vendor information that the study team collected. This included data on the race/ethnicity and gender of the owners of M/FBE-certified businesses and was compared with interview responses concerning business ownership.

A copy of the construction availability survey interview instrument follows.

SURVEY OF ATLANTA AREA CONSTRUCTION BUSINESSES

[NOTE TO INTERVIEWER – PURPOSE OF THE SURVEY – INTERVIEW STARTS HERE:]

Hello. My name is [*interviewer name*]. We are calling on behalf of the Atlanta Housing Authority (AHA) and Atlanta Public Schools (APS). This is not a sales call. These agencies are jointly compiling a list of companies interested in performing construction, repair and maintenance work in Atlanta.

Who can I speak with to get the information we need from your firm?

[NOTE TO INTERVIEWER – AFTER REACHING THE OWNER OR AN APPROPRIATELY SENIOR STAFF MEMBER, THE INTERVIEWER SHOULD RE-INTRODUCE THE PURPOSE OF THE INTERVIEW OUTLINED ABOVE AND BEGIN WITH QUESTIONS.]

[NOTE TO INTERVIEWER – IF NEEDED, INTERVIEWER CAN ADD THIS:

We are contacting thousands of contractors, suppliers and other types of businesses in the Atlanta area.]

[NOTE TO INTERVIEWER – IF INTERVIEWEE REQUESTS ADDITIONAL INFORMATION:

You may call Vona Cox at AHA at 404-685-4881 or LaShon Hunt at APS at 404-802-2531 for more information.]

[NOTE TO INTERVIEWER – IF ASKED:

The information developed in these interviews will add to AHA's and APS' existing data on companies interested in working with those two agencies.]

Introduction

X1. I have a few basic questions about your company and the type of work you do. Can you confirm that this is [*firm name*]?

1=Right company – SKIP TO A3

2=Not right company

3=Refused to give information – TERMINATE

X2. Can you give me any information about [*firm name*]?

[NOTE TO INTERVIEWER – READ LIST.]

1=Yes, same owner doing business under a different name – SKIP TO X5

2=Yes, can give information about [*firm name*]

3=Company bought/sold/changed ownership – SKIP TO X5

4=No, does not have information – TERMINATE

5=Refused to give information – TERMINATE

X3. Can you give me the phone number of [*firm name*]?

[NOTE TO INTERVIEWER – ENTER UPDATED PHONE OF NAMED COMPANY.]

1=VERBATIM

2=No, does not have information

3=Refused to give information

X4. Can you give me the complete address for [*firm name*]?

[NOTE TO INTERVIEWER – RECORD IN THE FOLLOWING FORMAT:

. STREET ADDRESS

. CITY

. STATE

. ZIP]

1=VERBATIM

2= No, does not have information

3=Refused to give information

X5. And what is the new name of the business that used to be [*firm name*]?

[NOTE TO INTERVIEWER – ENTER UPDATED NAME.]

1=VERBATIM

2=No, does not have information

3=Refused to give information

X6. Can you give me the name of the owner or manager of this business? [NOTE TO INTERVIEWER – THIS IS THE BUSINESS FROM X5.]

[NOTE TO INTERVIEWER – ENTER UPDATED NAME.]

1=VERBATIM

2=No, does not have information

3=Refused to give information

X7. Can I have a telephone number for them?

[NOTE TO INTERVIEWER – ENTER UPDATED PHONE NUMBER.]

1=VERBATIM

2=No, does not have information

3=Refused to give information

X8. Can you give me the complete address or city for [*new firm name*]?

[NOTE TO INTERVIEWER – RECORD IN THE FOLLOWING FORMAT:

. STREET ADDRESS

. CITY

. STATE

. ZIP]

1=VERBATIM

2=SAME AS X4

3=No, does not have information

4=Refused to give information

X9. Do you work for this new company?

1=Yes – CONTINUE

2=No – TERMINATE

Confirmation of Business and Commercial or Public Work

A1. [NONE]

A2. [NONE]

A3. Is your firm a business, as opposed to a non-profit organization, a foundation or a government office?

1=Yes

2=No [END – INTERVIEW COMPLETE.]

98=(Don't know)

A4. Let me also confirm what kind of business this is. The information we have from Dun & Bradstreet indicates that your main line of business is [*SIC Code description*]. Is this correct?

[NOTE TO INTERVIEWER – IF ASKED, DUN & BRADSTREET OR D&B IS A COMPANY THAT COMPILES BUSINESS INFORMATION THROUGHOUT THE COUNTRY.]

1=Yes – SKIP TO A6

2=No

98=(Don't know)

99=(Refused)

A5. What would you say is the main line of business of your company?

[NOTE TO INTERVIEWER – ENTER VERBATIM RESPONSE.]

1=VERBATIM

A6. Is this the sole location for your business, or do you have offices in other locations?

1=Sole location

2=Have other locations

98=(Don't know)

99=(Refused)

A7. Is your company a subsidiary or affiliate of another firm?

1=Independent – SKIP TO B1

2=Subsidiary or affiliate of another firm

98=(Don't know) – SKIP TO B1

99=(Refused) – SKIP TO B1

A8. What is the name of your parent company?

1=ENTER NAME

98=(Don't know) – SKIP TO B1

99=(Refused) – SKIP TO B1

A8. [NOTE TO INTERVIEWER – ENTER NAME OF PARENT COMPANY.]

1=VERBATIM

Type of Work

B1. What types of work does your firm perform? Please select from the list of industries that I am about to read. [NOTE TO INTERVIEWER – READ, MULTIPUNCH.]

11=Developer of multifamily properties

12=Building construction or other general contractor for multifamily properties

13=Building construction or other general contractor for school properties

14=Construction management for multifamily properties

15=Construction management for school properties

16=Site preparation

17=Concrete work

18=Plumbing, heating or air conditioning

19=Water and sewer lines

20=Electrical work

21=Construction materials and supplies

22=Plaster and drywall work

88=Other [DON'T READ]

98=(Don't know)

99=(Refused)

Role in Construction Work

C1. Next, thinking about work in the past five years in the Atlanta metro area, has your company bid on or been awarded work related to apartments or other multifamily housing?

1=Yes

2=No – SKIP TO C3

3=Other [DON'T READ] – SKIP TO C3

98=(Don't know) – SKIP TO C3

99=(Refused) – SKIP TO C3

C2. Were those bids or awards to work as *a prime contractor, a subcontractor or a supplier*?

11=Prime contractor

12=Subcontractor

13=Supplier (or manufacturer)

14=Prime and Sub

15=Sub and Supplier

16=Prime and Supplier

17=Prime, Sub, and Supplier

98=(Don't know)

99=(Refused)

C3. Is your company qualified and interested in working with the Atlanta Housing Authority or on an AHA-related property as a *developer*?

1=Yes

2=No

98=(Don't know)

99=(Refused)

C4. Is your company qualified and interested in working with the Atlanta Housing Authority or on an AHA-related property as a *prime contractor*?

1=Yes

2=No

98=(Don't know)

99=(Refused)

C5. Is your company qualified and interested in working with the Atlanta Housing Authority or on an AHA-related property as a *subcontractor* or *construction materials supplier*?

1=Yes

2=No

98=(Don't know)

99=(Refused)

C6. My next questions are about your company's involvement in school-related contracts. Thinking about work in the past five years in the Atlanta metro area, has your company bid on or been awarded work related to schools?

1=Yes

2=No – SKIP TO C8

3=Other [DON'T READ] – SKIP TO C8

98=(Don't know) – SKIP TO C8

99=(Refused) – SKIP TO C8

C7. Were those bids or awards to work as *a prime contractor, a subcontractor or a supplier*?

11=Prime contractor

12=Subcontractor

13=Supplier (or manufacturer)

14=Prime and Sub

15=Sub and Supplier

16=Prime and Supplier

17=Prime, Sub, and Supplier

98=(Don't know)

99=(Refused)

C8. Is your company qualified and interested in working with Atlanta Public Schools as a *prime contractor*?

1=Yes

2=No

98=(Don't know)

99=(Refused)

C9. Is your company qualified and interested in working with the Atlanta Public Schools as a *subcontractor* or *construction materials supplier*?

1=Yes

2=No

98=(Don't know)

99=(Refused)

Contract History

D1. My next questions are about the firm's contract history. In rough dollar terms, what was the largest contract or subcontract your company was awarded in the Atlanta metro area during the past five years?

[NOTE TO INTERVIEWER – INCLUDES CONTRACTS NOT YET COMPLETED.]

[NOTE TO INTERVIEWER – READ CATEGORIES IF NECESSARY:]

1=$100,000 or less

2=More than $100,000 to $500,000

3=More than $500,000 to $1 million

4=More than $1 million to $2 million

5=More than $2 million to $5 million

6=More than $5 million to $10 million

7=More than $10 million to $20 million

8=$20 million to $100 million

9=$100 million or more

97=(None) – SKIP TO E1

98=(Don't know) – SKIP TO E1

99=(Refused) – SKIP TO E1

D2. Was this the largest contract or subcontract that your company bid on or submitted quotes for in the Atlanta metro area during the past five years?

1=Yes – SKIP TO E1

2=No

98=(Don't know) – SKIP TO E1

99=(Refused) – SKIP TO E1

D3. What was the largest contract or subcontract that your company bid on or submitted quotes for in the Atlanta metro area during the past five years?

[NOTE TO INTERVIEWER – READ CATEGORIES IF NECESSARY:]

1=$100,000 or less

2=More than $100,000 to $500,000

3=More than $500,000 to $1 million

4=More than $1 million to $2 million

5=More than $2 million to $5 million

6=More than $5 million to $10 million

7=More than $10 million to $20 million

8=More than $20 million to $100 million

9=$100 million or more

97=(None)

98=(Don't know)

99=(Refused)

Ownership

E1. My next questions are about the ownership of the business. A business is defined as woman-owned if more than half — that is, 51 percent or more — of the ownership and control is by women. By this definition, is your firm a woman-owned business?

1=Yes

2=No

98=(Don't know)

99=(Refused)

E2. A business is defined as minority-owned if more than half — that is, 51 percent or more — of the ownership and control is African American, Asian, Hispanic, Native American or another minority group. By this definition, is your firm a minority-owned business?

1=Yes

2=No – SKIP TO F1

98=(Don't know) – SKIP TO F1

99=(Refused) – SKIP TO F1

E3. Would you say that the minority group ownership is mostly African American, Asian-Pacific American, Subcontinent Asian American, Hispanic American or Native American?

1=African American

2=Asian Pacific American (persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Common-wealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kirbati, Juvalu, Nauru, Federated States of Micronesia or Hong Kong)

3=Hispanic American (persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race)

4=Native American (American Indians, Eskimos, Aleuts or Native Hawaiians)

5=Subcontinent Asian American (persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka)

6=Other group [SPECIFY]

98=(Don't know)

99=(Refused)

E3. [NOTE TO INTERVIEWER – OTHER GROUP – SPECIFY.]

1=VERBATIM

Business Background

F1. My next questions are about the background of the business. About what year was your firm established?

[NOTE TO INTERVIEWER – RECORD FOUR-DIGIT YEAR, e.g., '1977'.]

9998=(Don't know)

9999=(Refused)

1=NUMERIC (1600-2016)

F2. My next set of questions pertain to annual averages for your company for 2014 through 2016 [NOTE TO INTERVIEWER – OR JUST YEARS IN BUSINESS IF FORMED AFTER 2012]. Dun & Bradstreet indicates that your company has about [*number*] employees working out of just your location. Is that an accurate estimate of your company's average employees from 2014 through 2016?

[NOTE TO INTERVIEWER – INCLUDES EMPLOYEES WHO WORK AT THAT LOCATION AND THOSE WHO WORK FROM THAT LOCATION.]

1=Yes – SKIP TO F4

2=No

98=(Don't know) – SKIP TO F4

99=(Refused) – SKIP TO F4

F3. About how many employees did you have working out of just your location, on average, from 2014 through 2016?

[NOTE TO INTERVIEWER – RECORD NUMBER OF EMPLOYEES:]

NUMERIC (1-999999999)

999999998=(Don't know)

999999999=(Refused)

F4. Dun & Bradstreet lists the annual gross revenue of your company, just considering your location, to be [*dollar amount*]. Is that an accurate estimate for your company's average annual gross revenue from 2014 through 2016 (or for the years your company was in business if started after 2014)?

1=Yes – SKIP TO F6

2=No

98=(Don't know) – SKIP TO F6

99=(Refused) – SKIP TO F6

F5. Roughly, what was the average annual gross revenue of your company, just considering your location, from 2014 through 2016? Would you say . . . [NOTE TO INTERVIEWER – READ LIST:]

21=Less than $1 million

22=$1 million to $5 million

23=$5.1 million to $7.5 million

24= $7.6 million to $11 million

25= $11.1 million to $15 million

26=$15.1 million to $20.5 million

27=$20.6 million to $36.5 million

28=more than $36.5 million

98=(Don't know)

99=(Refused)

F6. [NOTE TO INTERVIEWER – ASK IF MULTI-LOCATION FIRM NOTED IN A6. IF SINGLE LOCATION FIRM NOTED IN A6, GO TO G1a.] About how many employees did you have, on average, for all of your Atlanta metro area locations from 2014 through 2016?

[NOTE TO INTERVIEWER – RECORD NUMBER OF EMPLOYEES:]

NUMERIC (1-999999999)

999999998=(Don't know)

999999999=(Refused)

F7. Roughly, what was the average annual gross revenue of your company, for all of your Atlanta metro area locations from 2014 through 2016 (or for the years your company was in business if started after 2014)? Would you say . . . [NOTE TO INTERVIEWER – READ LIST:]

21=Less than $1 million

22=$1 million to $5 million

23=$5.1 million to $7.5 million

24= $7.6 million to $11 million

25= $11.1 million to $15 million

26=$15.1 million to $20.5 million

27=$20.6 million to $36.5 million

28=more than $36.5 million

98=(Don't know)

99=(Refused)

Barriers or Difficulties

Finally, we're interested in whether your company has experienced barriers or difficulties associated with business start-up or expansion in your industry, or with obtaining work. Think about your experiences within the past five years as you answer these questions.

G1a. Has your company experienced any difficulties in obtaining lines of credit or loans?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1b. Has your company obtained or tried to obtain a bond for a project?

1=Yes

2=No – SKIP TO G1d

97=(Does not apply) – SKIP TO G1d

98=(Don't know) – SKIP TO G1d

99=(Refused) – SKIP TO G1d

G1c. Has your company had any difficulties obtaining bonds needed for a project?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1d. Have you had any difficulty in being prequalified for work?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1e. Have any insurance requirements on projects presented a barrier to bidding?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1f. Has the large size of projects presented a barrier to bidding?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1g. Has your company experienced any difficulties learning about bid opportunities directly with the Atlanta Housing Authority?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1h. Has your company experienced any difficulties learning about bid opportunities directly with Atlanta Public Schools?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1i. Has your company experienced any difficulties learning about bid opportunities with other public agencies in the Atlanta metro area?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1j. Has your company experienced any difficulties learning about bid opportunities from property managers or developers of multifamily properties?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1k. Has your company experienced any difficulties with learning about bid opportunities in the private sector in general in the Atlanta metro area?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1l. Has your company experienced any difficulties learning about subcontracting opportunities with Atlanta metro area prime contractors?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1m1. Has your company experienced any difficulties receiving payment from the Atlanta Housing Authority?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1m2. Has your company experienced any difficulties receiving payment from Atlanta Public Schools?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1n. Has your company experienced any difficulties receiving payment from property managers or developers?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1o. Has your company experienced any difficulties receiving payment from prime contractors?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1p. Has your company experienced any difficulties receiving payment from other customers in the private sector?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G1q. Has your company experienced any difficulties obtaining final approval on your work from inspectors or prime contractors?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

G2. Do any other barriers come to mind about winning work as a prime or subcontractor in the Atlanta metro area? Also, do you have any general thoughts or insights on starting and expanding a business in your field?

1=VERBATIM [NOTE TO INTERVIEWER – PROBE FOR COMPLETE THOUGHTS.]

97=(Nothing/None/No comments)

98=(Don't know)

99=(Refused)

G3. Would you be willing to participate in a follow-up interview about any of these issues?

1=Yes

2=No

97=(Does not apply)

98=(Don't know)

99=(Refused)

Additional Questions

H1. Just a few last questions. What is your name?

[NOTE TO INTERVIEWER – RECORD FULL NAME:]

1=VERBATIM

99=(Refused)

H2. What is your position at [*firm name / new firm name*]?

1=Receptionist

2=Owner

3=Manager

4=CFO

5=CEO

6=Assistant to Owner/CEO

7=Sales manager

8=Office manager

9=President

10=Other [SPECIFY]

99=(Refused)

H2. [NOTE TO INTERVIEWER – ENTER OTHER – SPECIFY:]

1=VERBATIM

H3. For purposes of receiving procurement information from the Atlanta Housing Authority and Atlanta Public Schools, is your mailing address [*firm address*]?

1=Yes – SKIP TO H5

2=No

98=(Don't know) – SKIP TO H5

99=(Refused) – SKIP TO H5

H4. What mailing address should the agencies use to get any materials to you?

1=VERBATIM

99=(Refused)

H5. What fax number could they use to fax any materials to you?

1=NUMERIC (1000000000-9999999999)

97=(No fax)

98=(Don't know)

99=(Refused)

H6. What e-mail address could they use to get any materials to you?

1=ENTER E-MAIL

97=(No email address)

98=(Don't know)

99=(Refused)

H6. [NOTE TO INTERVIEWER – RECORD EMAIL ADDRESS. VERIFY ADDRESS LETTER BY LETTER. EXAMPLE: 'John@CRI-RESEARCH.COM' SHOULD BE VERIFIED AS: J-O-H-N-at-C-R-I-hyphen-R-E-S-E-A-R-C-H-dot-com]

1=VERBATIM

[NOTE TO INTERVIEWER – END OF SURVEY MESSAGE:]

Thank you for your time. This is very helpful for the Atlanta Housing Authority and Atlanta Public Schools.

APPENDIX D.
Disparity Analysis Methodology

Keen Independent's disparity analysis compares the percentage of contract dollars going to MBEs and WBEs with the level of participation that might be expected based on the availability analysis. Appendix D provides disparity calculations and describes the statistical significance of the results.

A. Disparity Analysis for APS-related Contracts

To conduct the disparity analysis, Keen Independent compared the actual utilization of MBE/WBEs on APS-related prime contracts and subcontracts (described in Appendix B) with the percentage of contract dollars that MBE/WBEs might be expected to receive based on their availability for that work (discussed in Appendix C). Availability is also referred to as the "benchmark" for the disparity analysis. Keen Independent compared utilization with availability benchmarks for individual MBE/WBE groups.

Disparity index. Keen Independent expressed both utilization and availability as percentages of the total dollars associated with a particular set of contracts, making them directly comparable (e.g., 5 percent utilization compared with 4 percent availability). Keen Independent then calculated a "disparity index" to help compare utilization and availability results among MBE/WBE groups and across different sets of contracts. Figure D-1 describes how the study team calculated disparity indices.

- A disparity index of 100 indicates an exact match (often referred to as "parity") between actual utilization and what might be expected based on MBE/WBE availability for a specific set of contracts.
- A disparity index of less than 100 may indicate a disparity between utilization and availability, and disparities of less than 80 in this report are described as "substantial."[1]

Figure D-1.
Calculation of disparity indices

The disparity index provides a straightforward way of assessing how closely actual utilization of an MBE/WBE group matches what might be expected based on its availability for a specific set of contracts. With the disparity index, one can directly compare results for one group to that of another group, and across different sets of contracts. Disparity indices are calculated using the following formula:

$$\frac{\text{\% actual utilization}}{\text{\% availability}} \times 100$$

For example, if actual utilization of MBEs on a set of APS contracts was 2 percent and the availability of MBEs for those contracts was 4 percent, then the disparity index would be 2 percent divided by 4 percent, which would then be multiplied by 100 to equal 50. In this example, MBEs would have received 50 cents of every dollar that they might be expected to receive based on their availability for the work.

[1] Some courts deem a disparity index below 80 as being "substantial" and have accepted it as evidence of adverse impacts against MBE/WBEs. For example, see *Associated General Contractors of America, San Diego Chapter, Inc. v. California Department of Transportation, et al.*, 713 F. 3d 1187 (9th Cir. 2013); *Rothe Development Corp v. U.S. Dept of Defense*, 545 F.3d 1023 (Fed. Cir 2008); *Eng'g Contractors Ass'n of South Florida, Inc. v. Metropolitan Dade County*, 122 F.3d 914 (11th Circuit 1997); *Concrete Works of Colo., Inc. v. City and County of Denver*, 36 F.3d 1513 (10th Cir. 1994). Also see Appendix A for additional discussion.

Results for all contracts awarded by APS. Figure D-2 shows disparity indices for each MBE group and for white women-owned firms on APS contracts examined in this study. Because utilization exceeded availability for Native American- and white women-owned firms, disparity indices for these groups exceeded 100. Disparity indices were less than 80 for African American- and Hispanic American-owned firms. The disparity index for Asian American-owned firms was less than 100 but above 80, and not considered "substantial" according to some courts. The disparity index for MBEs overall was 18.

Figure D-2.
Disparity analysis for all APS contracts, July 2011-June 2016

	Utilization	Availability	Disparity index
MBE/WBE			
African American-owned	2.9 %	27.8 %	10
Asian American-owned	1.7	2.0	85
Hispanic American-owned	0.6	1.3	46
Native American-owned	0.3	0.1	300
Total MBE	5.5 %	31.2 %	18
WBE (white women-owned)	4.9	4.1	120
Total MBE/WBE	10.4 %	35.3 %	29

Note: Disparity index = 100 x Utilization/Availability.

Source: Keen Independent utilization and availability analyses for all APS contracts examined in the study.

Results for construction contracts awarded by APS. Figure D-3 presents results for APS construction contracts (including subcontracts). There was a substantial disparity for African American-owned firms, with a disparity index of 8. There were no disparities between utilization and availability for other minority groups or WBEs on APS construction contracts.

Figure D-3.
Disparity analysis for APS construction contracts, July 2011-June 2016

	Utilization	Availability	Disparity index
MBE/WBE			
African American-owned	2.3 %	29.2 %	8
Asian American-owned	1.6	1.2	133
Hispanic American-owned	0.7	0.7	100
Native American-owned	0.3	0.1	300
Total MBE	4.8 %	31.1 %	15
WBE (white women-owned)	5.2	3.6	144
Total MBE/WBE	10.0 %	34.7 %	29

Note: Disparity index = 100 x Utilization/Availability.

Source: Keen Independent utilization and availability analyses for APS construction contracts.

Results for professional services contracts and other procurements awarded by APS. Keen Independent also calculated disparity indices for professional services contracts and other procurements awarded by APS. These are primarily A&E and IT contracts. Figure D-4 provides these results by MBE group and for WBEs.

Disparity indices were less than 80 for each group. Therefore, there were substantial disparities between the utilization and availability of each MBE group and WBEs for APS professional services contracts and related procurements.

Figure D-4.
Disparity analysis for APS professional services contracts and related procurements, July 2011-June 2016

	Utilization	Availability	Disparity Index
MBE/WBE			
African American-owned	8.6 %	16.0 %	54
Asian American-owned	2.6	9.2	28
Hispanic American-owned	0.2	6.4	3
Native American-owned	0.0	0.1	0
Total MBE	11.4 %	31.6 %	36
WBE (white women-owned)	2.7	8.8	31
Total MBE/WBE	14.1 %	40.4 %	35

Note: Disparity index = 100 x Utilization/Availability.

Source: Keen Independent utilization and availability analyses for APS professional services contracts and other procurements.

B. Statistical Significance of Disparity Analysis Results for APS-related Contracts

Testing for statistical significance relates to testing the degree to which a researcher can reject "random chance" as an explanation for any observed differences.

Random chance in data sampling is the factor that researchers consider most in determining the statistical significance of results. However, the study team attempted to contact every firm in the relevant geographic market area identified as possibly doing business within relevant subindustries (as described in Appendix C), mitigating many of the concerns associated with random chance in data sampling as they may relate to Keen Independent's availability analysis.

Figure D-5.
Confidence intervals for availability and utilization measures

Keen Independent conducted telephone interviews with 952 business establishments, which might be treated as a "population," not a sample. However, if the results are treated as a sample, the reported 37.4 percent representation of MBEs among all available firms is accurate within about +/- 2.4 percentage points. The level of accuracy for WBEs is similar (+/- 1.5 of the overall figure of 10.0 percent). By comparison, many survey results for proportions reported in the popular press are accurate within +/- 5 percentage points. (Keen Independent applied a 95 percent confidence level and the finite population correction factor when determining these confidence intervals.)

Keen Independent attempted to collect data for all relevant APS-related contracts during the study period and no confidence interval calculation applies for the utilization results.

The utilization analysis also approaches a "population" of contracts. Therefore, one might consider any disparity identified when comparing overall utilization with availability to be "statistically significant."

Figure D-5 on the previous page explains the high level of statistical confidence in the results. The study team also used a sophisticated statistical simulation tool to further examine statistical significance of disparity results, as described below and in Figure D-6.

Monte Carlo analysis. There were many opportunities in the sets of APS prime contracts and subcontracts for MBE/WBEs to be awarded work. Some contract elements involved large dollar amounts and others involved only a few thousand dollars.

Monte Carlo analysis was a useful tool for the study team to use for statistical significance testing in the disparity study, because there were many individual chances at winning contracts, each with a different payoff. Figure D-6 describes Keen Independent's use of Monte Carlo analysis.

Figure D-6.
Monte Carlo analysis

The study team began the Monte Carlo analysis by examining individual contract elements. For each contract element, Keen Independent's availability database provided information on individual businesses that were available for that contract element, based on type of work, contractor role, contract size and location of the work.

The study team assumed that each available firm had an equal chance of "receiving" that contract element. For example, the odds of an MBE receiving that contract element were equal to the number of MBEs available for the contract element divided by the total number of firms available for the work. The Monte Carlo simulation then randomly chose a business from the pool of available businesses to "receive" that contract element.

The Monte Carlo simulation repeated the above process for all other elements in a particular set of contracts. The output of a single Monte Carlo simulation for all contract elements in the set represented simulated utilization of MBEs for that set of contract elements.

The entire Monte Carlo simulation was then repeated 10,000 times. The combined output from all 10,000 simulations represented a probability distribution of the overall utilization of MBEs and utilization of WBEs if contracts were awarded randomly among businesses identified as available for APS work.

The output of the Monte Carlo simulations represents the number of runs out of 10,000 that produced a simulated utilization result that was equal or below the observed utilization in the actual data for each MBE/WBE group and for each set of contracts. If that number was less than or equal to 500 (i.e., 5.0% of the total number of runs), then the disparity index can be considered to be statistically significant (using a one-tailed test).

Results. Keen Independent identified a substantial disparity between MBE utilization and availability for APS contracts. Therefore, the Monte Carlo simulation focused on these results.

Figure D-7 presents the results from the Monte Carlo analysis as they relate to the statistical significance of disparity analysis results for MBEs for APS contracts.

Monte Carlo simulations replicated the observed disparity for MBEs in none of 10,000 simulation runs. This result means that one can be confident that chance in contract award can be rejected as an explanation of the observed disparity for minority-owned firms in APS contracts.[2]

It is important to note that this test may not be necessary to establish statistical significance of results (see discussion in Figure D-6 and elsewhere in this appendix), and it may not be appropriate for a very small population of firms.[3]

Figure D-7.
Monte Carlo results for APS contracts

	MBE	WBE
Utilization	5.5 %	4.9 %
Disparity index	18	120
Number of simulation runs out of 10,000 that replicated observed utilization	0	n/a
Probability of observed disparity occurring due to "chance"	< 0.1 %	n/a
Reject chance in awards of contracts as a cause of disparity?	Yes	n/a

Note: Utilization results based on Keen Independent's analysis of APS contracts between July 2011 and June 2016.
Disparity index = 100 x Utilization/Availability.

Source: Keen Independent from APS contract data and 2017 availability survey data.

[2] When Keen Independent examined professional services contracts, one could reject chance in contract award as an explanation of the overall disparity for MBE/WBEs. The Monte Carlo simulation replicated the observed disparity in just 4 percent of the simulations (400 of 10,000 simulations).

[3] Even if there were zero utilization of a particular group, Monte Carlo simulation might not reject chance in contract awards as an explanation for that result if there were a small number of firms in that group or a small number of contract elements included in the analysis. Results can also be affected by the size distribution of contract elements.

C. Disparity Results for Analysis of School Projects in the Atlanta Area

Keen Independent compiled data on non-APS primary, junior high and high school projects in the Atlanta Metropolitan Area, as described in Appendix B. Projects had start dates from January 2014 to December 2016. Results are analyzed below.

Dodge data for school construction contracts in the Atlanta Metropolitan Area. Keen Independent examined 273 non-APS public and private sector contracts for which firm ownership could be determined. Those contracts had a total value of $1.9 billion. Minority-owned companies were general contractors for about $40 million of these projects, or about 2 percent of the total contract dollars. Firms identified as white women-owned were general contractors for about $5 million, or approximately 0.3 percent of the dollars. Figure D-8 provides detailed results.

Figure D-8.
Dollars of prime contracts on primary, junior high and high school construction projects within the Atlanta Metropolitan Area, January 2014-December 2016

	Dodge construction prime contracts		
	Number of projects	Dollars (millions)	Percent of dollars
Minority-owned	20	$ 40	2.1 %
White women-owned	8	5	0.3
Total MBE/WBE	28	$ 45	2.3 %
Majority-owned	245	1,882	97.7
Total	273	$ 1,927	100.0 %

Source: Keen Independent from Dodge Data & Analytics Dodge Reports data.

Keen Independent compared the Dodge utilization results for school contractors with what might be anticipated based on the availability survey data. There were 41 minority-owned firms among the 96 companies in the availability database reporting qualifications and interest in school projects that performed either school building construction or construction management. There were nine white women-owned firms for these specializations in the availability data. Percentage availability is 42.7 percent for MBEs and 9.4 percent for WBEs based on these data, as shown in the middle column of Figure D-9 on the following page.

Utilization of MBEs (2.1%) was substantially below what might be expected based on the availability analysis (42.7%). Utilization of WBEs (0.3%) was also substantially below the availability benchmark of 9.4 percent. Disparity indices were 5 and 3 for MBEs and for WBEs, respectfully.

Figure D-9.
Disparity analysis for prime contracts on non-APS primary, junior high and high school construction projects within the Atlanta Metropolitan Area, January 2014-December 2016

	Utilization	Availability	Disparity index
Minority-owned	2.1 %	42.7 %	5
White women-owned	0.3	9.4	3
Total MBE/WBE	2.4 %	52.1 %	5
Majority-owned	97.7	47.9	
Total	100.1 %	100.0 %	

Source: Keen Independent from analysis of Dodge Data & Analytics Dodge Reports data and 2017 availability survey data for school building contractors and construction management firms qualified and interested in APS school projects.

It is important to note that these data do not include subcontract information and only provide a partial picture of overall participation of MBE/WBEs on these contracts. The availability data were collected for firms qualified and interested in school building contracting and construction management in the APS availability survey, which might not reflect availability for school projects across the Atlanta Metropolitan Area. The analysis did not reflect any differences in bid capacity of MBE/WBEs compared to majority-owned firms. In addition, there were certain limitations in identifying ownership of minority-, women- and majority-owned contractors identified in the Dodge data.

Keen Independent's sensitivity analyses examining certain of the above factors would not fully explain the observed disparities, however.

Dodge Reports data for design firms for school projects in the Atlanta Metropolitan Area. The Dodge Reports data also provided information on the lead design firm working on many of those primary, junior high and high school projects.

Limiting the analysis to businesses for which Keen Independent could determine ownership, design firms were listed 285 times (some projects had multiple firms listed). Minority-owned firms were identified as the design firm 43 times and businesses owned by white women were listed 11 times. Relative to the total number of design contracts identified, MBEs accounted for 15.1 percent of the design contracts and WBEs received 3.9 percent of the design contracts. (Dollars of design contracts were not provided in the Dodge Reports data.)

Figure D-10.
Number of design projects for non-APS primary, junior high and high schools within the Atlanta Metropolitan Area, January 2014-December 2016

	Dodge A&E firms	
	Number of design awards	Percentage
Minority-owned	43	15.1 %
White women-owned	11	3.9
Total MBE/WBE	54	18.9 %
Majority-owned	231	81.1
Total	285	100.0 %

Source: Keen Independent from analysis of Dodge Data & Analytics Dodge Reports data.

There were 230 architectural and engineering (A&E) firms reporting qualifications and interest in APS-related design work in the 2017 availability survey. Sixty-one companies were minority-owned (27%) and 26 businesses were white women-owned (11%).

Figure D-11 compares the percentage of design contracts going to MBEs and WBEs with those availability benchmarks. As shown, the representation of minority-owned firms and white women-owned businesses was substantially below what might be anticipated from the availability analysis, with disparity indices below 80 for both MBEs and WBEs.

Figure D-11.
Disparity analysis for design firms on non-APS primary, junior high and high school construction projects within the Atlanta Metropolitan Area, January 2014-December 2016

	Utilization	Availability	Disparity index
Minority-owned	15.1 %	26.5 %	57
White women-owned	3.9	11.3	34
Total MBE/WBE	18.9 %	37.8 %	50
Majority-owned	81.1	62.2	
Total	100.0 %	100.0 %	

Source: Keen Independent from analysis of Dodge Data & Analytics Dodge Reports data and 2017 availability survey data for A&E firms qualified and interested in APS school projects.

APPENDIX E.
Entry and Advancement in the Construction; Architecture and Engineering; and Information Technology Industries in the Atlanta Public Schools Market Area

Federal courts have found that Congress "spent decades compiling evidence of race discrimination in government highway contracting, of barriers to the formation of minority-owned construction businesses, and of barriers to entry."[1] Congress found that discrimination had impeded the formation of qualified minority-owned businesses. In the marketplace appendices (Appendix E through Appendix I), the study team examines whether some of the barriers to business formation that Congress found for minority- and women-owned businesses also appear to occur in the Atlanta Metropolitan Statistical Area (MSA).[2]

One potential source of barriers to business formation are barriers associated with entry and advancement in the construction; architecture and engineering; and information technology industries. Appendix E examines recent data on education, employment, and workplace advancement that may ultimately influence business formation in the Atlanta Metropolitan Area construction; architecture and engineering; and information technologies industries.[3]

Introduction

Appendix E uses the 2010-2014 American Community Survey (ACS) data to analyze education, employment, and workplace advancement — all factors that may influence whether individuals form construction; architecture and engineering; and information technologies businesses. The study team studied barriers to entry into construction, architecture and engineering, and information technology separately, because entrance requirements and opportunities for advancement differ for those industries.

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[1] *Sherbrooke Turf, Inc.*, 345 F.3d at 970, (citing *Adarand Constructors, Inc.*, 228 F.3d at 1167 – 76); *Western States Paving Co. v. Washington State DOT*, 407 F.3d 983 (9th Cir. 2005) at 992.

[2] For the purposes of the marketplace analyses in this study (Appendices E, F, G and H), the Atlanta Public Schools market area corresponds to the 29 county Atlanta-Sandy Springs-Roswell, GA Metropolitan Statistical Area (MSA) as defined by the Office of Management and Budget (OMB) in 2013. Because the Census suppresses county information in the American Community Survey (ACS) data to safeguard respondent confidentiality, this target geography must be approximated using Public Use Microdata Areas (PUMAs). Specifically, a PUMA is assigned to the study area if and only if the majority of that PUMA's population resided in the Atlanta MSA in 2010. Note that the University of Minnesota IPUMS platform includes a derived variable — MET2013 — that directly identifies the approximated study area. Further, due to a redrawing of PUMA boundaries that took place between 2011 and 2012 in response to updated data from 2010 Census, the effective geography underlying the 2010-2011 portion of the 5-year ACS sample is slightly different from that of the 2012-2014 portion. The 2013 geographic area used in the marketplace analyses encompasses the entire 20 county area used for the availability analysis and 97% of the population in the 29 county market area resides within the 20 county area.

[3] Several other report appendices analyze other quantitative aspects of conditions in the Atlanta MSA. Appendix F explores business ownership. Appendix G presents an examination of access to capital. Appendix H considers the success of businesses. Appendix I presents the data sources that the study team used in those appendices.

Minority workers and business owners in the Atlanta MSA. As a starting point, the study team examined the representation of racial/ethnic minorities among workers and business owners in the Atlanta MSA. Figure E-1 shows demographics of the labor force, business owners in the Atlanta MSA construction; architecture and engineering; information technologies; and business owners in the Atlanta MSA in other non-study industries based on 2010-2014 data. Due to small sample sizes, Asian-Pacific Americans, Subcontinent Asian Americans and other minorities are studied together throughout much of this appendix. (Demographics of the construction; architecture and engineering; and information technologies industries are considered separately later in Appendix E).

Demographic results for the Atlanta MSA in 2010 through 2014 indicated that most minority groups had a lower representation among construction, architecture and engineering, and information technology business owners than in the workforce as a whole:

- African Americans accounted for about 33 percent of all workers and 23 percent of business owners in non-study industries, but only 15 percent of business owners in the study industries; and
- Other minorities accounted for approximately 9 percent of non-study industry business owners, but only 5 percent of business owners in the study industries.

Hispanic American had a higher representation among business owners in the relevant study industries than among business owners in all other industries in the Atlanta MSA in 2010 through 2014. Hispanic Americans accounted for approximately 10 percent of all workers, 9 percent of non-study industry business owners, and 21 percent of business owners in the study industries.

Non-Hispanic whites had equal representation (60%) in both non-study and study industries in the Atlanta MSA in 2010 through 2014.

Female workers and business owners in the Atlanta MSA. Figure E-1 also presents the representation of women among workers and business owners in 2010 through 2014, in the Atlanta MSA. In 2010 through 2014, women accounted for about 48 percent of the Atlanta MSA labor force and 43 percent of non-study industry business owners. However, women only accounted for 9 percent of business owners in the construction, architecture and engineering, and information technologies industries during those years.

Figure E-1.
Demographic distribution of the workforce and business owners, Atlanta MSA 2010-2014

Atlanta MSA	Workforce in all industries 2010-14 (n=117,957)	Business owners in non-study industries 2010-14 (n=9,696)	Business owners study industries 2010-14 (n=2,312)
Race/ethnicity			
African American	33.2 %	22.5 %	14.6 % **
Hispanic American	9.9	8.9	21.3 **
Other minority group	6.2	9.0	4.6 **
Non-Hispanic white	50.7	59.6	59.6
Total	100.0 %	100.0 %	100.0 %
Gender			
Female	47.9 %	42.6 %	8.9 % **
Male	52.1	57.4	91.1 **
Total	100.0 %	100.0 %	100.0 %

Note:

** Denotes that the difference in proportions between all non-study industry business owners and business owners in the relevant study industries for the given race/ethnicity/gender group is statistically significant at the 95% confidence level.

Source:

BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Educational attainment in the Atlanta MSA. A need for advanced education or training can be a barrier to entry or advancement in many industries. Based on 2010-2014 ACS data, Figure E-2 presents the percentage of workers age 25 and older with at least a four-year college degree in the Atlanta MSA.

Race/ethnicity. In the Atlanta MSA, about 48 percent of all non-Hispanic white workers age 25 and older had at least a four-year degree in 2010 through 2014. For other racial/ethnic groups, the data for the Atlanta MSA indicated that:

- About 32 percent of African Americans had at least a four-year college degree;
- Only 18 percent of Hispanic Americans had at least a four-year college degree; and
- About 38 percent of Native Americans had at least a four-year college degree.

Subcontinent Asian Americans in the Atlanta MSA were more likely than non-Hispanic whites to be college graduates.

Gender. In the Atlanta MSA in 2010 through 2014, about 42 percent of women and 39 percent of men had at least a four-year college degree.

Figure E-2.
Percentage of all workers age 25 and older with at least a four-year degree in the Atlanta metro area, 2010-2014

Note:

** Denotes that the difference in proportions between the minority and non-Hispanic white groups (or female and male gender groups) for the given Census/ACS year is statistically significant at the 95% confidence level.

Source:

BBC Research & Consulting from 2000 U.S. Census 5% sample and 2010-2014 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Atlanta MSA	2010-2014	
Race/ethnicity		
African American	32.0 %	**
Asian-Pacific American	46.2	
Subcontinent Asian American	78.1	**
Hispanic American	17.6	**
Native American	38.1	**
Other minority group	45.5	
Non-Hispanic white	47.5	
Gender		
Female	41.7 %	**
Male	38.8	

Construction Industry

The study team examined how education, training, employment, and advancement may affect the number of businesses that individuals of different races/ethnicities and genders owned in the construction industry in the Atlanta MSA in 2010 through 2014.

Education. Formal education beyond high school is not a prerequisite for most construction jobs. For that reason, the construction industry often attracts individuals who have relatively low levels of educational attainment. Most construction industry employees in the Atlanta MSA do not have a four-year college degree. Based on the 2010-2014 ACS, 42 percent of workers in the construction industry in the Atlanta MSA were high school graduates with no post-secondary education, and 26 percent had not finished high school. Only 14 percent of those working in the construction industry in the Atlanta MSA had a four-year college degree or higher, compared to 40 percent of all workers.

Race/ethnicity. Hispanic Americans represented an especially large pool of workers with no post-secondary education in the Atlanta MSA. As can be seen in Figure E-2 above, in 2010 through 2014, only 18 percent of all Hispanic American workers 25 and older in the Atlanta MSA held at least a four-year college degree, far below the figure for non-Hispanic whites working in the region (48%). The percentage of African American (32%) and Native American (38%) workers in the Atlanta MSA with a four-year college degree was also substantially lower than that of non-Hispanic whites in 2010 through 2014. Based on educational requirements of entry-level jobs and the limited education beyond high school for many African Americans, Native Americans, and Hispanic Americans in the Atlanta MSA, one would expect a relatively high representation of those groups in the construction industry, especially in entry-level positions.

A substantial proportion of Subcontinent Asian American workers 25 and older (78%) in the Atlanta MSA had four-year college degrees in 2010 through 2014. Given the relatively high levels of education for Subcontinent Asian Americans in the area, the representation of those groups in the construction industry in the Atlanta MSA might be similar to or lower than that of non-Hispanic whites.

Apprenticeship and training. Training in the construction industry is largely on-the-job and through trade schools and apprenticeship programs. Entry-level jobs for workers out of high school are often for laborers, helpers, or apprentices. More skilled positions in the construction industry may require additional training through a technical or trade school or through an apprenticeship or other employer-provided training program. Apprenticeship programs can be developed by employers, trade associations, trade unions, or other groups.

Workers can enter apprenticeship programs from high school or trade school. Apprenticeships have traditionally been three- to five-year programs that combine on-the-job training with classroom instruction.[4] Opportunities for those programs across race/ethnicity are discussed later in Appendix E.

Employment. With educational attainment as context, the study team examined the demographics of employment in the Atlanta MSA construction industry. Figure E-3 presents data from 2010 through 2014 to compare the demographic composition of the construction industry with the total workforce in all other industries in the Atlanta MSA.

Figure E-3.
Demographics of workers in construction and all non-construction industries, 2010-2014

Note:

** Denotes that the difference in proportions between workers in the construction industry and all non-construction industries for the given ACS year is statistically significant at the 95% confidence level.

Source:

BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Atlanta MSA	Non-construction industries 2010-14 (n=111,169)	Construction industry 2010-14 (n=6,788)
Race/ethnicity		
African American	34.5 %	14.4 % **
Hispanic American	8.2	34.2 **
Other minority group	6.5	2.1 **
Non-Hispanic white	50.8	49.2 **
Total	100.0 %	100.0 %
Gender		
Female	50.5 %	9.7 % **
Male	49.5	90.3 **
Total	100.0 %	100.0 %

Race/ethnicity. Based on 2010-2014 ACS data, approximately 50 percent of people working in the construction industry in the Atlanta MSA were minorities. An examination of the Atlanta MSA construction workforce in 2010 through 2014 shows that:

- Thirty-four percent was made up of Hispanic Americans;
- Fourteen percent was made up of African Americans; and
- Two percent was made up of Other Minorities.

[4] Bureau of Labor Statistics, U.S. Department of Labor. 2015. "Construction Laborers and Helpers." *Occupational Outlook Handbook*. Available at: https://www.bls.gov/ooh/construction-and-extraction/construction-laborers-and-helpers.htm#tab-4 (first accessed February 15, 2007).

In the Atlanta MSA, Hispanic Americans made up a much larger percentage of workers in construction (34%) than in other non-construction industries (8%). In contrast, African Americans and other minorities accounted for smaller percentages of workers in the construction industry than in non-construction industries.

Average educational attainment of African Americans and Native Americans is consistent with requirements for construction jobs, so education does not explain the relatively low number of African American and Native American workers in the Atlanta MSA construction industry. Several studies throughout the United States have argued that race discrimination by construction unions has contributed to the low employment of African Americans in construction trades.[5] The role of unions is discussed more thoroughly later in Appendix E (including research that suggests discrimination is now less prevalent in unions).

Gender. There were large differences between the percentage of all workers who were women and the percentage of construction workers who were women in the Atlanta MSA in 2010 through 2014. During those years, women represented about 51 percent of all non-construction workers in the Atlanta MSA but only 10 percent of construction workers.

Academic research concerning the effect of race- and gender-based discrimination. There is substantial academic literature that has examined whether race- or gender-based discrimination affects opportunities for minorities and women to enter construction trades in the United States. Many studies indicate that race- and gender-based discrimination affects opportunities for minorities and women in the construction industry. The literature concerning women in construction trades has identified substantial barriers to entry and advancement due to gender discrimination and sexual harassment.[6] Research concerning highway construction projects in three major U.S. cities (Boston, Los Angeles, and Oakland) identified evidence of prevailing attitudes that women do not belong in construction, and that such discrimination was worse for women of color than for white women.[7]

Importance of unions to entry in the construction industry. Labor researchers characterize construction as a historically volatile industry that is sensitive to business cycles, making the presence of labor unions important for stability and job security within the industry.[8] The temporary nature of construction work results in uncertain job prospects, and the relatively high turnover of laborers presents a disincentive for construction firms to invest in training. Some researchers have claimed that constant turnover has lent itself to informal recruitment practices and nepotism, compelling laborers to tap social networks for training and work. They credit the importance of social networks with the high degree of ethnic segmentation in the construction industry.[9] Unable to integrate

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[5] Waldinger, Roger and Thomas Bailey. 1991. "The Continuing Significance of Race: Racial Conflict and Racial Discrimination in Construction." *Politics & Society.* 19(3).

[6] See, for example, Erickson, Julia A and Donna E. Palladino. 2009. "Women Pursuing Careers in Trades and Construction." *Journal of Career Development.* 36(1): 68-89.

[7] Note that those interviews took place between 1996 and 1999. Price, Vivian, 2002. "Race, Affirmative Action and Women's Participation in U.S. Highway Construction." *Feminist Economics.* 8(2): 87-113.

[8] Applebaum, Herbert. 1999. Construction Workers, U.S.A. Westport: Greenwood Press.

[9] Waldinger, Roger and Thomas Bailey. 1991. "The Continuing Significance of Race: Racial Conflict and Racial Discrimination in Construction." *Politics & Society.* 19(3).

themselves into traditionally white social networks, African Americans and other minorities faced long-standing historical barriers to entering into the industry.[10]

Construction unions aim to provide a reliable source of labor for employers and preserve job opportunities for workers by formalizing the recruitment process, coordinating training and apprenticeships, enforcing standards of work, and mitigating wage competition. The unionized sector of construction would seemingly be the best road for African Americans and other underrepresented groups into the industry. However, some researchers have identified racial discrimination by trade unions that have historically prevented minorities from obtaining employment in skilled trades.[11] Some researchers argue that union discrimination has taken place in a variety of forms, including the following examples:

- Unions have used admissions criteria that adversely affect minorities. In the 1970s, federal courts ruled that standardized testing requirements for unions unfairly disadvantaged minority applicants who had less exposure to testing. In addition, the policies that required new union members to have relatives who were already in the union perpetuated the effects of past discrimination.[12]
- Of those minority individuals who are admitted to unions, a disproportionately low number are admitted into union-coordinated apprenticeship programs. Apprenticeship programs are an important means of producing skilled construction laborers, and the reported exclusion of African Americans from those programs has severely limited their access to skilled occupations in the construction industry.[13]
- Although formal training and apprenticeship programs exist within unions, most training of union members takes place informally through social networking. Nepotism characterizes the unionized sector of construction as it does the non-unionized sector, and that practice favors a white-dominated status quo.[14]
- Traditionally, white unions have been successful in resisting policies designed to increase African American participation in training programs. The political strength of unions in resisting affirmative action in construction has hindered the advancement of African Americans in the industry.[15]

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[10] Feagin, Joe R. and Nikitah Imani. 1994. "Racial Barriers to African American Entrepreneurship: An Exploratory Study." Social Problems. 41(4): 562-584.

[11] U.S. Department of Justice. 1996. Proposed Reforms to Affirmative Action in Federal Procurement. 61 FR 26042.

[12] *Ibid.* See *United States v. Iron Workers Local 86* (1971), *Sims v. Sheet Metal Workers International Association* (1973), and *United States v. International Association of Bridge, Structural and Ornamental Iron Workers* (1971).

[13] Applebaum. 1999. Construction Workers, U.S.A.

[14] *Ibid.* 299. A high percentage of skilled workers reported having a father or relative in the same trade. However, the author suggests this may not be indicative of current trends.

[15] Waldinger and Bailey. 1991. "The Continuing Significance of Race: Racial Conflict and Racial Discrimination in Construction."

- Discriminatory practices in employee referral procedures, including apportioning work based on seniority, have precluded minority union members from having the same access to construction work as their white counterparts.[16]
- According to testimony from African American union members, even when unions implement meritocratic mechanisms of apportioning employment to laborers, white workers are often allowed to circumvent procedures and receive preference for construction jobs.[17]

However, more recent research suggests that the relationship between minorities and unions has been changing. As a result, historical observations may not be indicative of current dynamics in construction unions. Recent studies focusing on the role of unions in apprenticeship programs have compared minority and female participation and graduation rates for apprenticeships in joint programs (that unions and employers organize together) with rates in employer-only programs. Many of those studies conclude that the impact of union involvement is generally positive or neutral for minorities and women, compared to non-Hispanic white males:

- Glover and Bilginsoy (2005) analyzed apprenticeship programs in the U.S. construction industry during the period 1996 through 2003. Their dataset covered about 65 percent of apprenticeships during that time. The authors found that joint programs had "much higher enrollments and participation of women and ethnic/racial minorities" and exhibited "markedly better performance for all groups on rates of attrition and completion" compared to employer-run programs.[18]
- In a similar analysis focusing on female apprentices, Bilginsoy and Berik (2006) found that women were most likely to work in highly-skilled construction professions as a result of enrollment in joint programs as opposed to employer-run programs. Moreover, the effect of union involvement in apprenticeship training was higher for African American women than for white women.[19]
- A recent study on the presence of African Americans and Hispanic Americans in apprenticeship programs found that African Americans were 8 percent more likely to be enrolled in a joint program than in an employer-run program. However, Hispanic Americans were less likely to be in a joint program than in an employer-run program.[20] Those data suggest that Hispanic Americans may be more likely than African Americans to enter the construction industry without the support of a union.

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[16] U.S. Department of Justice. 1996. Proposed Reforms to Affirmative Action in Federal Procurement. 61 FR 26042. See *United Steelworkers of America v. Weber* (1979) and *Taylor v. United States Department of Labor* (1982).

[17] Feagin and Imani. 1994. "Racial Barriers to African American Entrepreneurship: An Exploratory Study." *Social Problems.* 41(4): 562-584.

[18] Glover, Robert and Cihan Bilginsoy. 2005. "Registered Apprenticeship Training in the U.S. Construction Industry." *Education & Training.* 47(4/5): 337.

[19] Berik, Günseli and Cihan Bilginsoy. 2006. "Still a wedge in the door: women training for the construction trades in the USA." *International Journal of Manpower.* 27(4): 321-341.

[20] Bilginsoy, Cihan. 2005. "How Unions Affect Minority Representation in Building Trades Apprenticeship Programs." *Journal of Labor Research.* 57(1).

Other data also indicate a more productive relationship between unions and minority workers than that which may have prevailed in the past. For example, 2012 Current Population Survey (CPS) data indicate that union membership rates for African Americans is slightly higher than for non-Hispanic whites and union membership rates for Hispanic Americans are similar to those of non-Hispanic whites.[21] The CPS asked participants, "Are you a member of a labor union or of an employee association similar to a union?" CPS data showed union membership to be 13 percent for African American workers, 10 percent for Hispanic American workers and 11 percent for non-Hispanic white workers. In the construction industry, the union membership rates for both African American workers and non-Hispanic white workers is 17 percent, but the rate for Hispanic construction workers is only 8 percent.

Although union membership and union program participation varies based on race/ethnicity, the causes of those differences and their effects on construction industry employment are unresolved. Research is especially limited on the impact of unions on Asian American employment. It is unclear from past studies whether unions presently help or hinder equal opportunity in construction and whether effects in the Atlanta MSA are different from other parts of the country. In addition, the current research indicates that the effects of unions on entry into the construction industry may be different for different minority groups.

Advancement. To research opportunities for advancement in the Atlanta MSA construction industry, the study team examined the representation of minorities and women in construction occupations defined by the U.S. Bureau of Labor Statistics.[22] Appendix I provides full descriptions of construction trades with large enough sample sizes in the 2010-2014 ACS for the study team to analyze.

Racial/ethnic composition of construction occupations. Figure E-4 presents the race/ethnicity of workers in select construction-related occupations in the Atlanta MSA, including low-skill occupations (e.g., construction laborers), higher-skill construction trades (e.g., electricians), and supervisory roles. Figure E-4 presents those data for 2010 through 2014.

Based on 2010-2014 ACS data, there are large differences in the racial/ethnic makeup of workers in various trades related to construction in the Atlanta MSA. Overall, minorities comprised 50 percent of the construction industry workforce in 2010 through 2014.

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[21] 2012 Current Population Survey (CPS), Merged Outgoing Rotation Groups, U.S. Census Bureau and Bureau of Labor Statistics.

[22] Bureau of Labor Statistics, U.S. Department of Labor. 2001. "Standard Occupational Classification Major Groups." http://www.bls.gov/soc/soc_majo.htm (accessed February 15, 2007).

Minorities comprised a relatively large percentage of laborers working as:

- Cement masons (86%);
- Drywall installers (83%);
- Brick masons (82%);
- Painters (80%);
- Roofers (76%); and
- Construction laborers (71%).

Some occupations had relatively low representations of minorities:

- Iron and steel workers (23%);
- Machine operators (32%);
- Sheet metal workers (36%); and
- Electricians (39%).

Minorities made up 31 percent of first-line supervisors in 2010 through 2014. That percentage was less than the total percentage of construction workers who were minorities during those years (50%).

Most minorities working in the Atlanta MSA construction industry in 2010 through 2014 were Hispanic Americans. The representation of Hispanic Americans was substantially larger among:

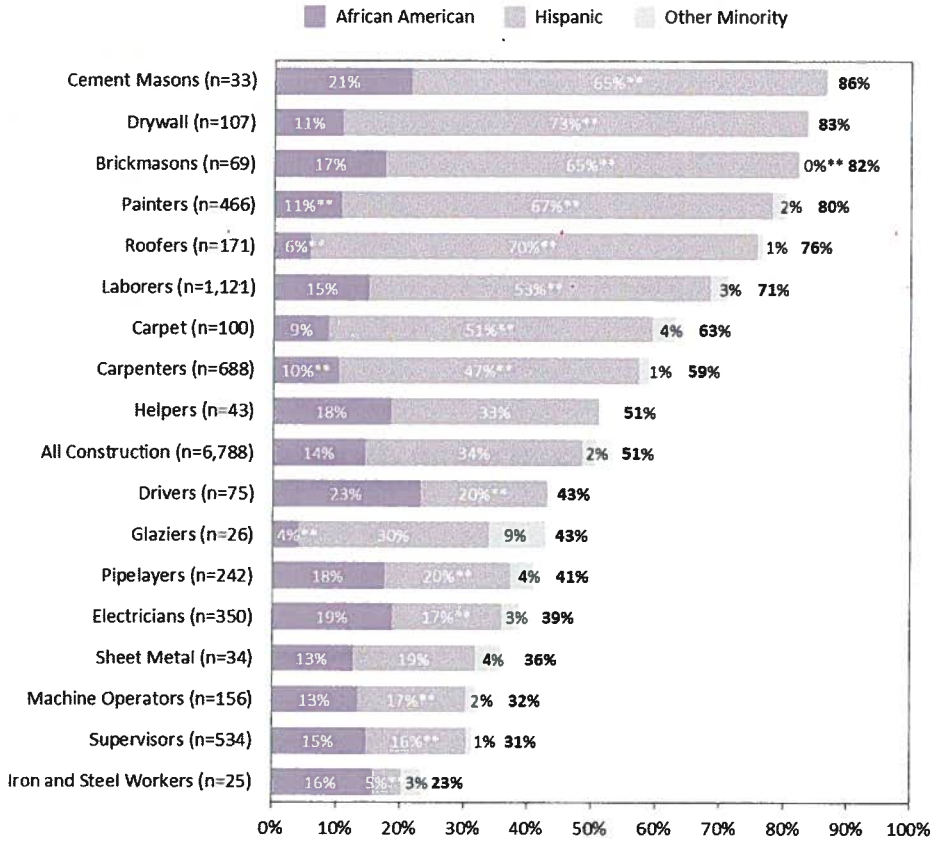
- Drywall installers (73%);
- Roofers (70%);
- Painters (67%);
- Brick masons (65%);
- Cement masons (65%);
- Construction laborers (53%);
- Carpet installers (51%); and
- Carpenters (47%).

Those occupations tend to be low-skill occupations. In contrast, among the higher-skilled occupations, Hispanic Americans were less represented:

- Iron and steel workers (5%);
- Supervisors (16%);
- Machine operators (17%);
- Sheet metal workers (19%); and
- Electricians (17%).

The representation of African Americans in the construction industry was not greater than 25 percent for any occupation.

Figure E-4.
Minorities as a percentage of selected construction occupations in the Atlanta MSA, 2010-2014



Note: Crane and tower operators, dredge, excavating and loading machine and dragline operators, paving, surfacing and tamping equipment operators and miscellaneous construction equipment operators were combined into the single category of machine operators.

** Denotes that the difference in proportions between workers in the construction industry overall and specified construction occupations at the 95% confidence level.

Source: BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

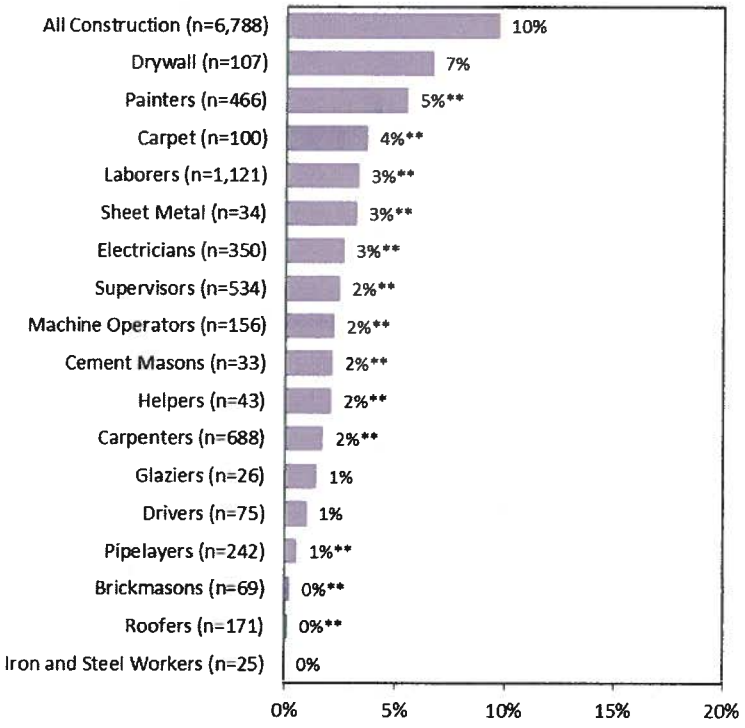
Gender composition of construction occupations. The study team also analyzed the proportion of women in construction-related occupations. Figure E-5 summarizes the gender of workers in select construction-related occupations for 2010 through 2014. Overall, only 10 percent of construction workers in the Atlanta MSA were women in 2010 through 2014.

In 2010 through 2014, less than 2 percent of workers were women in the following trades:

- Glaziers;
- Drivers;
- Pipelayers;
- Brickmasons;
- Roofers; and
- Iron and steel workers.

The proportion of first-line supervisors who were women was 2 percent in 2010 through 2014.

Figure E-5.
Women as a percentage of selected construction occupations in the Atlanta MSA, 2010-2014



Note: Crane and tower operators, dredge, excavating and loading machine and dragline operators, paving, surfacing and tamping equipment operators and miscellaneous construction equipment operators were combined into the single category of machine operators.

** Denotes that the difference in proportions between workers in the construction industry overall and specified construction occupations at the 95% confidence level.

Source: BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Percentage of minorities and women who are managers. To further assess advancement opportunities for minorities and women in the Atlanta MSA construction industry, the study team examined differences between demographic groups the proportion of construction workers who reported being managers. Figure E-6 presents the percentage of construction workers who reported being construction managers in 2010 through 2014 for the Atlanta MSA by racial/ethnic and gender group.

Figure E-6.
Percentage of construction workers who worked as a manager in the Atlanta MSA, 2010-2014

Note:

** Denotes that the difference in proportions between the minority group and non-Hispanic whites (or between females and males) for the given Census/ACS year is statistically significant at the 95% confidence level.

Source:

BBC Research & Consulting 2010-2014 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Atlanta MSA	2010-2014
Race/ethnicity	
African American	6.8 % **
Hispanic American	2.2 **
Other minority group	8.1
Non-Hispanic white	11.3
Gender	
Female	5.2 % **
Male	7.7
All individuals	7.4 %

In 2010 through 2014, about 11 percent of non-Hispanic whites in the Atlanta MSA construction industry were managers. Compared with non-Hispanic whites, a smaller percentage of African Americans and Hispanic Americans were managers in the Atlanta MSA construction industry:

- Approximately 7 percent of African Americans working in the Atlanta MSA construction industry were managers; and
- About 2 percent of Hispanic Americans were managers.

Female construction workers in the Atlanta MSA were also less likely than their male counterparts to be managers.

Architecture and Engineering Industry

The study team also examined how education and employment may potentially influence the number of minority and female entrepreneurs working in the Atlanta MSA architecture and engineering industry.

Education. In contrast to the construction industry, lack of educational attainment may preclude workers' entry into the architecture and engineering industry because many occupations require at least a four-year college degree and some require licensure. According to the 2010-2014 ACS, 70 percent of individuals over the age of 24 and working in the Atlanta MSA architecture and engineering industry had at least a four-year college degree. Therefore, barriers to education can restrict employment opportunities, advancement opportunities, and, ultimately, business ownership.

Any disparities in business ownership rates in architecture- and engineering-related work could have resulted from the lack of sufficient education for particular race/ethnicity and gender groups.[23]

On page 4 of this appendix, Figure E-2 presented the percentage of workers age 25 and older with at least a four-year college degree in the Atlanta MSA. Results suggest that the level of education necessary to work in the architecture and engineering industry may partially restrict employment opportunities for African Americans, Hispanic Americans, and Native Americans. For each of those groups, the percentage of workers age 25 or older with a bachelor's degree or higher was substantially less than that of non-Hispanic whites in the Atlanta MSA for 2010 through 2014.

Employment. After consideration of educational opportunities and attainment for minorities and women, the study team examined the race/ethnicity and gender composition of workers in the architecture and engineering industry in the Atlanta MSA. Figure E-7 compares the demographic composition of workers in the Atlanta MSA architecture and engineering industry to that of all workers in the Atlanta MSA who are 25 years or older and have a college degree.

Figure E-7.
Demographic distribution of architecture- and engineering-related workers and workers age 25 and older with a four-year college degree in all industries in Atlanta, 2010-2014.

Atlanta MSA	Workers 25+ with college degree (n=45,905)	A&E workforce (n=864)
Race/ethnicity		
African American	25.9 %	14.1 % **
Asian-Pacific American	4.4	4.2
Subcontinent Asian American	3.7	1.6 **
Hispanic American	4.1	3.6
Native American	0.4	0.2
Other minority group	0.3	0.0
Total minority	38.7 %	23.6 %
Non-Hispanic white	61.3	76.4 **
Total	100.0 %	100.0 %
Gender		
Female	49.6 %	22.8 % **
Male	50.4	77.2 **
Total	100.0 %	100.0 %

Note:

** Denotes that the difference in proportions between architecture and engineering workers and workers age 25+ in all industry groups for the given Census/ACS year is statistically significant at the 95% confidence level.

Source:

BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Race/ethnicity. In 2010 through 2014, about 26 percent of the workforce in the architecture and engineering industry in the Atlanta MSA was made up of minorities. Of that workforce:

- Fourteen percent was made up of African Americans;
- Approximately 4 percent was made up of Asian-Pacific Americans;
- About 2 percent was made up of Subcontinent Asian Americans;
- About 4 percent was made up of Hispanic Americans; and
- Less than one-half of one percent was made up of Native Americans.

[23] Feagin, Joe R. and Nikitah Imani. 1994. "Racial Barriers to African American Entrepreneurship: An Exploratory Study." *Social Problems.* 42(4): 562-584.

In 2010 through 2014, African Americans made up 26 percent of workers with a four-year college degree but only 14 percent of workers in the architecture and engineering industry. Subcontinent Asian Americans were 4 percent of workers with a college degree but less than 2 percent of architecture and engineering workers.

Gender. Compared to their representation among workers 25 and older with a college degree in all industries, substantially fewer women work in the architecture and engineering industry. In 2010 through 2014, women represented 50 percent of workers with a four-year college degree, but only about 23 percent of architecture- and engineering-related workers in the Atlanta MSA.

Information Technology Industry

The study team also examined how employment may potentially influence the number of minority and female entrepreneurs working in the information technology industry in the Atlanta MSA.

Employment. The study team also examined the employment in the Atlanta MSA information technology industry. Figure E-8 presents data from 2010 through 2014 comparing the composition of the information technology industry with the workforce in all other industries in the Atlanta MSA.

Figure E-8.
Demographic distribution of information technology workers and workers age 25 and older with a four-year college degree in all industries in Atlanta, 2010-2014.

Note:

** Denotes that the difference in proportions between information technology workers and workers age 25+ in all industry groups for the given Census/ACS year is statistically significant at the 95% confidence level.

Source:

BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Atlanta MSA	Workers 25+ with college degree (n=45,905)	IT workforce (n=2,103)	
Race/ethnicity			
African American	25.9 %	17.8 %	**
Asian-Pacific American	4.4	6.1	**
Subcontinent Asian American	3.7	17.5	**
Hispanic American	4.1	2.6	**
Native American	0.4	0.2	
Other minority group	0.3	0.8	
Total minority	38.7 %	44.9 %	
Non-Hispanic white	61.3	55.1	**
Total	100.0 %	100.0 %	
Gender			
Female	49.6 %	28.5 %	**
Male	50.4	71.5	**
Total	100.0 %	100.0 %	

Race/ethnicity. Based on 2010-2014 ACS data, 45 percent of people working in the information technology industry in the Atlanta MSA were minorities. Of that workforce:

- 18 percent was made up of African Americans;
- 6 percent was made up of Asian-Pacific Americans;
- About 18 percent was made up of Subcontinent Asian Americans;
- Less than 3 percent was made up of Hispanic Americans; and
- Less than one-half of one percent was made up of Native Americans.

In 2010 through 2014, African Americans were 26 percent of workers with a four-year college degree but only 18 percent of workers in the information technology industry. Hispanic Americans comprised 4 percent of workers with a four-year college degree but about 3 percent of information technology workers. In contrast, Subcontinent Asian Americans made up approximately 4 percent of workers with a college degree but 18 percent of information technology workers.

Gender. There was a substantial difference between the percentage of all workers with a college degree who were women and the percentage of information technology industry workers who were women in the Atlanta MSA in 2010 through 2014. During those years, women represented 50 percent of workers with a college degree in the Atlanta MSA but only 29 percent of information technology industry workers.

Summary

The study team's analyses suggest that there are barriers to entry for certain minority groups and for women in the construction, architecture and engineering, and information technology industries in the Atlanta MSA.

- Based on data for 2010 through 2014, fewer African Americans worked in the Atlanta MSA construction industry than what might be expected based on their representation in the overall workforce.
- Fewer African Americans and Subcontinent Asian Americans worked in the Atlanta MSA architecture and engineering industry than what might be expected based on their representation among workers 25 and older with a college degree.
- Fewer African Americans and Hispanic Americans worked in the Atlanta MSA information technology industry than what might be expected based on their representation among workers with a college degree.
- Women accounted for particularly few workers in the Atlanta MSA construction, architecture and engineering, and information technology industries.

Barriers to advancement for certain minority groups and for women are also evident in the Atlanta MSA construction industry based on data for 2010 through 2014.

- Representation of minorities and women was much lower in certain construction trades (including first-line supervisors) compared with other trades.
- Compared to non-Hispanic whites working in the construction industry, African Americans, Hispanic Americans and other minorities were less likely to be managers.
- Women were less likely to be managers in the construction industry relative to men.

APPENDIX F.
Business Ownership in the Construction; Architecture and Engineering; and Information Technology Industries in the Atlanta Public Schools Market Area

About one in four construction workers in the Atlanta Metropolitan Area was a self-employed business owner in 2010 through 2014.[1] About one in nine workers in the local architecture and engineering and the local information technology industries was a self-employed business owner. Focusing on those four industries, BBC Research and Consulting examined business ownership for different racial, ethnic and gender groups in the study area. The study team used Public Use Microdata Samples (PUMS) from the 2010 through 2014 American Community Survey (ACS) to study business ownership rates in the construction; architecture and engineering; and information technology industries. Note that "self-employment" and "business ownership" are used interchangeably in Appendix F.

Business Ownership Rates

Many studies have explored differences between minority and non-minority business ownership at the national level.[2] Although overall self-employment rates have increased for minorities and women over time, a number of studies indicate that race/ethnicity and gender continue to affect opportunities for business ownership. The extent to which such individual characteristics may limit business ownership opportunities differs across industries and from state to state.

Construction industry. Compared to other industries, construction has a large number of business owners relative to the number of people working in the industry. In 2010 through 2014, 25 percent of workers in the construction industry in the Atlanta Metropolitan Area were self-employed (in incorporated or unincorporated businesses) compared with only 9 percent of workers across all industries. However, rates of self-employment in the local construction industry vary by race, ethnicity and gender. Figure F-1 shows the percentage of workers in the Atlanta Metropolitan Area

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[1] For the purposes of this study, the Atlanta metropolitan area corresponds to the 29 county Atlanta-Sandy Springs-Roswell, GA Metropolitan Statistical Area (MSA) as defined by the Office of Management and Budget (OMB) in 2013. Because the Census suppresses county information in the American Community Survey (ACS) data to safeguard respondent confidentiality, however, this target geography must be approximated using Public Use Microdata Areas (PUMAs). Specifically, a PUMA is assigned to the study area if and only if the majority of that PUMA's population resided in the Atlanta MSA in 2010. Note that the University of Minnesota IPUMS platform includes a derived variable — MET2013 — that directly identifies the approximated study area. Further, due to a redrawing of PUMA boundaries that took place between 2011 and 2012 in response to updated data from 2010 Census, the effective geography underlying the 2010-2011 portion of the 5-year ACS sample is slightly different from that of the 2012-2014 portion.

[2] See, for example, Waldinger, Roger and Howard E. Aldrich. 1990. *Ethnicity and Entrepreneurship.* Annual Review of Sociology. 111-135.; Fairlie, Robert W. and Bruce D. Meyer. 1996. *Ethnic and Racial Self-Employment Differences and Possible Explanations.* The Journal of Human Resources. 31(4): 757-793; Fairlie, Robert W. and Alicia M. Robb. 2007. *Why are Black-Owned Businesses Less Successful than White-Owned Businesses? The Role of Families, Inheritances and Business Human Capital.* Journal of Labor Economics. 25(2): 289-323; and Fairlie, Robert W. and Alicia M. Robb. 2006. *Race, Families and Business Success: A Comparison of African-American-, Asian-, and White-Owned Businesses.* Russell Sage Foundation.

who were self-employed in the construction industry by racial/ethnic group and gender from 2010 through 2014. Due to small sample sizes, Subcontinent Asian Americans and other minority groups are included in the "other minority" category.

Figure F-1.
Percentage of workers in the construction industry who were self-employed, 2010-2014

Note: *, ** Denotes that the difference in proportions between the minority and non-Hispanic white groups (or female and male groups) for the given Census/ACS year is statistically significant at the 90% or 95% confidence level, respectively.
† Other minority includes Subcontinent Asian Americans and other minority groups.

Source: BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Atlanta MSA	Self-Employment Rate 2010-2014	Sample size 2010-2014
Race/ethnicity		
African American	25.7 % **	923
Asian-Pacific American	35.3 %	92
Hispanic American	18.5 % **	1,708
Native American	33.0 %	36
Other Minority†	34.5 %	22
Non-Hispanic white	29.3 %	4,007
Gender		
Female	16.2 % **	749
Male	26.2 %	6,039
All individuals	25.2 %	6,788

In 2010 through 2014, a substantial disparity existed in the business ownership rate for African Americans and Hispanic Americans when compared to non-Hispanic whites.

- Approximately 26 percent of African Americans construction workers in the Atlanta Metropolitan Area owned their businesses, which was significantly lower than the 29 percent of non-Hispanic whites.
- Almost 19 percent of Hispanic Americans in the construction industry owned their businesses in 2010 through 2014, slightly more than half the rate for non-Hispanic whites in the Atlanta Metropolitan Area.

Sixteen percent of women working in the construction industry in the Atlanta Metropolitan Area were self-employed in 2010 through 2014, compared with 26 percent of men (a statistically significant difference).

Architecture and engineering industry. The study team examined business ownership rates in the architecture and engineering (A&E) industry for the Atlanta Metropolitan Area. Figure F-2 presents the percentage of workers who were self-employed in the A&E industry in 2010 through 2014. Due to small sample sizes, Native Americans are included in the "other minority" category.

As shown in Figure F-2, African Americans had substantially lower business ownership rates than non-Hispanic whites. Additionally, the rate of business ownership for women (5%) working in the A&E industry was less than half the rate of men (13%) in 2010 through 2014.

Figure F-2.
Percentage of workers in the architecture and engineering industry who were self-employed, 2010-2014

Note: *, ** Denotes that the difference in proportions between the minority and non-Hispanic white groups (or female and male groups) for the given Census/ACS year is statistically significant at the 90% or 95% confidence level, respectively.
† Other minority includes Native Americans and other minority groups.

Source: BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Atlanta MSA	Self-Employment Rate 2010-2014	Sample size 2010-2014
Race/ethnicity		
African American	6.5 % **	165
Asian-Pacific American	17.6 %	39
Subcontinent Asian American	2.9 %	16
Hispanic American	15.2 %	43
Other Minority†	18.4 %	4
Non-Hispanic white	12.0 %	957
Gender		
Female	5.1 % **	313
Male	13.4 %	911
All individuals	11.3 %	1,224

Information technology industry. The study team also examined business ownership rates in the information technology (IT) industry. Figure F-3 presents the percentage of workers who were self-employed in the information technology industry in 2010 through 2014. Due to small sample sizes, Native Americans are included in the "other minority" category.

As shown in Figure F-3, the rates of business ownership for African Americans, Asian-Pacific Americans and Subcontinent Asian Americans working in the IT industry were substantially lower than that of non-Hispanic whites (12%).

- The business ownership rate for African Americans was 9 percent, three-fourths the rate for non-Hispanic whites.
- The business ownership rates for Asian-Pacific Americans (8%) and Subcontinent Asian Americans (8%) were each approximately two-thirds the rate for non-Hispanic whites.

The rate of business ownership for women working in IT industry (9%) was not significantly different from the rate for men (11%) in 2010 through 2014.

Figure F-3.
Percentage of workers in the information technology industry who were self-employed, 2010-2014

Note: *, ** Denotes that the difference in proportions between the minority and non-Hispanic white groups (or female and male groups) for the given Census/ACS year is statistically significant at the 90% or 95% confidence level, respectively.
† Other minority includes Subcontinent Asian Americans and other minority groups.

Source: BBC Research & Consulting from 2010-2014 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Atlanta MSA	Self-Employment Rate 2010-2014	Sample size 2010-2014
Race/ethnicity		
African American	8.5 % *	457
Asian-Pacific American	7.8 % **	177
Subcontinent Asian American	7.6 % **	362
Hispanic American	9.2 %	89
Other Minority†	11.8 %	25
Non-Hispanic white	12.4 %	1,810
Gender		
Female	9.4 %	850
Male	11.1 %	2,070
All individuals	10.6 %	2,920

Potential causes of differences in business ownership rates. Researchers have examined whether there are disparities in business ownership rates after considering business owners' race- and gender-neutral personal characteristics such as education and age. Several studies have found that disparities in business ownership still exist even after accounting for such race- and gender-neutral factors.

- Some studies have concluded that access to financial capital is a strong determinant of business ownership. Researchers have consistently found a positive relationship between start-up capital and business formation, expansion, and survival.[3] In addition, one study found that housing appreciation measured at the Metropolitan Statistical Area level is a positive determinant of becoming self-employed.[4] However, unexplained differences still exist when statistically controlling for those factors.[5] Access to capital is discussed in more detail in Appendix G.
- Education has a positive effect on the probability of business ownership in most industries. However, findings from multiple studies indicate that minorities are still less likely to own a business than non-minorities with similar levels of education.[6]

[3] See Lofstrom, Magnus and Chunbei Wang. 2006. Hispanic Self-Employment: A Dynamic Analysis of Business Ownership. Working paper, Forschungsinstitut zur Zukunft der Arbeit (Institute for the Study of Labor); and Fairlie, Robert W. and Alicia M. Robb. 2006. Race, Families and Business Success: A Comparison of African-American-, Asian-, and White-Owned Businesses. Russell Sage Foundation.

[4] Fairlie, Robert W. and Harry A. Krashinksy. 2006. Liquidity Constraints, Household Wealth and Entrepreneurship Revisited.

[5] Lofstrom, Magnus and Chunbei Wang. 2006. Hispanic Self-Employment: A Dynamic Analysis of Business Ownership. Working paper, Forschungsinstitut zur Zukunft der Arbeit (Institute for the Study of Labor).

[6] See Fairlie, Robert W. and Bruce D. Meyer. 1996. Ethnic and Racial Self-Employment Differences and Possible Explanations. The Journal of Human Resources. 31(4): 757-793; and Butler, John Sibley and Cedric Herring. 1991. Ethnicity and Entrepreneurship in America: Toward an Explanation of Racial and Ethnic Group Variations in Self-Employment. Sociological Perspectives. 79-94.

- Intergenerational links affect one's likelihood of self-employment. One study found that experience working for a self-employed family member increases the likelihood of business ownership for minorities.[7]
- Time since immigration and assimilation into American society are also important determinants of self-employment, but unexplained differences in business ownership between minorities and non-minorities still exist when accounting for those factors.[8]

Business Ownership Regression Analysis

Race, ethnicity, and gender can affect opportunities for business ownership, even when accounting for individuals' race- and gender-neutral personal characteristics such as education, age, and familial status. To further examine business ownership, the study team developed multivariate regression models to explore patterns of business ownership in the Atlanta Metropolitan Area. Those models estimate the effect of race/ethnicity and gender on the probability of business ownership while statistically controlling for other factors.

An extensive body of literature examines whether race- and gender-neutral personal factors such as access to financial capital, education, age, and family characteristics (e.g., marital status) help explain differences in business ownership. That subject has also been examined in other disparity analyses. For example, prior studies in Minnesota and Illinois have used econometric analyses to investigate whether disparities in business ownership for minorities and women working in the construction and engineering industries persist after statistically controlling race- and gender-neutral personal characteristics.[9, 10] Those studies have incorporated probit econometric models using data from the U.S. Bureau of the Census and have been among materials that agencies have submitted to courts in subsequent litigation concerning the implementation of the Federal DBE Program.

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[7] See Fairlie, Robert W. and Alicia M. Robb. 2006. Race, Families and Business Success: A Comparison of African-American-, Asian-, and White-Owned Businesses. Russell Sage Foundation; and Fairlie, Robert W. and Alicia M. Robb. 2007. Why are Black-Owned Businesses Less Successful than White-Owned Businesses? The Role of Families, Inheritances and Business Human Capital. Journal of Labor Economics. 25(2): 289-323.

[8] See Fairlie, Robert W. and Bruce D. Meyer. 1996. Ethnic and Racial Self-Employment Differences and Possible Explanations. The Journal of Human Resources. 31(4): 757-793; and Butler, John Sibley and Cedric Herring. 1991. Ethnicity and Entrepreneurship in America: Toward an Explanation of Racial and Ethnic Group Variations in Self-Employment. Sociological Perspectives. 79-94.

[9] National Economic Research Associates, Inc. 2000. *Disadvantaged Business Enterprise Availability Study.* Prepared for the Minnesota Department of Transportation.

[10] National Economic Research Associates, Inc. 2004. *Disadvantaged Business Enterprise Availability Study.* Prepared for the Illinois Department of Transportation.

The study team used similar probit regression models to predict business ownership from multiple independent or "explanatory" variables.[11] Independent variables included:

- Personal characteristics that are potentially linked to the likelihood of business ownership — age, age-squared, disability, marital status, number of children in the household, number of elderly people in the household, and English-speaking ability;
- Indicators of educational attainment;
- Measures and indicators related to personal financial resources and constraints — home ownership, home value, monthly mortgage payment, dividend and interest income, and additional household income from a spouse or unmarried partner; and
- Variables representing the race/ethnicity and gender of the individuals included in the analysis along with interaction variables to represent the combined effect of being a minority and being female.

The study team developed three models using PUMS data for the Atlanta Metropolitan Area from the 2010 through 2014 ACS:

- A probit regression model for the construction industry that included 6,152 observations;
- A probit regression model for the architecture and engineering industry that included 1,154 observations; and
- A probit regression model for the information technology industry that included 2,711 observations.

Results for the construction industry in the Atlanta Metropolitan Area in 2010 through 2014. Figure F-4 presents the coefficients from the probit model predicting business ownership in the construction industry in 2010 through 2014. The model indicates that several race- and gender-neutral factors were important and statistically significant in predicting the probability of business ownership in the construction industry:

- Older individuals were more likely to be business owners; an increase in the number of children living in the worker's household was associated with an increase in the worker's likelihood of owning a business;
- For those who owned a home, higher home values were associated with a higher likelihood of business ownership;
- Income from a spouse or partner increased workers' likelihood of owning a business; and

[11] Probit models estimate the effects of multiple independent or "predictor" variables in terms of a single, dichotomous dependent or "outcome" variable — in this case, business ownership. The dependent variable is binary, coded as "1" for individuals in a particular industry who are self-employed; "0" for individuals who are not self-employed. The model enables estimation of the probability that a worker in a given estimation sample is self-employed. The study team excluded observations where the Census Bureau had imputed values for the dependent variable, business ownership.

- Having some college education was associated with a higher likelihood of business ownership; however, having a four-year degree was associated with a lower likelihood of business ownership.

After controlling for race- and gender-neutral factors, a statistically significant difference persisted in the rates of business ownership for female construction workers in the relevant geographic market area.

Figure F-4.
Construction industry business ownership model 2010 through 2014 Dependent Variable: Business Ownership

Note: *, ** Denote statistical significance at the 90% and 95% confidence levels, respectively.

Source: BBC Research & Consulting from 2010-2014 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Variable	Coefficient
Constant	-1.8148 **
Age	0.0260 **
Age-squared	-0.0001
Married	-0.0782
Number of children in household	0.0424 *
Number of people over 65 in household	-0.0140
Owns home	0.0557
Home value ($000s)	0.0000 **
Monthly mortgage payment ($000s)	0.0001
Interest and dividend income ($000s)	0.0000
Income of spouse or partner ($000s)	0.0000 **
Speaks English well	0.1114
Disabled	0.0084
Less than high school education	0.0221
Some college	0.1018 *
Four-year degree	-0.2885 **
Advanced degree	-0.2129
Hispanic American	-0.0627
African American	-0.0315
Asian-Pacific American	0.2075
Subcontinent Asian American	0.4733
Native American	0.0944
Other minority	0.4075
Female	-0.5300 **

Simulations of business ownership rates. The study team used the 2010 through 2014 results to simulate business ownership rates if women had the same probability of self-employment as similarly situated non-Hispanic white males. Again, the study team performed these calculations for only those groups where race, ethnicity or gender was a statistically significant negative factor in business ownership (as shown in Figure F-4). Figure F-5 shows actual and simulated ("benchmark") business ownership rates for non-Hispanic white female construction workers in the study area.

Simulation results for women in 2010 through 2014 indicated a substantial disparity. About 36 percent of women would own businesses in the construction industry if gender did not have an impact on self-employment. However, the actual 2010 through 2014 self-employment rate for women was 17 percent (disparity index of 48).

Figure F-5.
Comparison of actual business ownership rates to simulated rates
for Atlanta Metropolitan Area construction workers, 2010 through 2014

Group	Self-employment rate		Disparity index (100 = parity)
	Actual	Benchmark	
Non-Hispanic white female	17.1%	35.5%	48

Note: As the benchmark figure can only be estimated for records with an observed (rather than imputed) dependent variable, comparison is made with only this subset of the sample. For this reason, actual self-employment rates may differ slightly from those in Figure F-1.

Source: BBC Research & Consulting from statistical models of 2010-2014 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Results specific to the architecture and engineering industry in the Atlanta Metropolitan Area in 2010 through 2014. Figure F-6 presents the coefficients from the probit model predicting business ownership in the architecture and engineering industry in the Atlanta Metropolitan Area in 2010 through 2014. The model indicates that some race- and gender-neutral factors were important and statistically significant in predicting the probability of business ownership in the architecture and engineering industry:

- Income from a spouse or partner increased likelihood of owning a business; and
- Having a four-year degree or an advanced degree was associated with a higher likelihood of business ownership.

After controlling for race- and gender-neutral factors, a statistically significant difference persisted in the rates of business ownership for working in the A&E industry in the Atlanta Metropolitan Area.

Figure F-6.
Architecture and Engineering industry business ownership model, 2010 through 2014

Note: *, ** Denote statistical significance at the 90% and 95% confidence levels, respectively.

Source: BBC Research & Consulting from 2010-2014 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Variable	Coefficient
Constant	-0.5393
Age	-0.0441
Age-squared	0.0008
Married	0.1893
Number of children in household	0.0516
Number of people over 65 in household	-0.0957
Owns home	0.1636
Home value ($000s)	0.0000
Monthly mortgage payment ($000s)	0.0000
Interest and dividend income ($000s)	0.0000
Income of spouse or partner ($000s)	0.0000 **
Speaks English well	-1.2073
Disabled	-0.1746
Less than high school education	0.7242
Some college	0.1360
Four-year degree	0.4739 *
Advanced degree	0.5698 **
Hispanic American	0.1694
African American	-0.1399
Asian-Pacific American	0.4257
Subcontinent Asian American	-0.8198
Native American	0.9176
Female	-0.4431 **

Simulations of business ownership rates. The study team simulated business ownership rates in the architecture and engineering industry using the same approach as it used for the construction industry. Figure F-7 presents actual and simulated ("benchmark") business ownership rates for non-Hispanic white female workers in the local architecture and engineering industry.

Figure F-7.
Comparison of actual business ownership rates to simulated rates for Atlanta Metropolitan Area architecture and engineering workers, 2010 through 2014

Group	Self-employment rate		Disparity index (100 = parity)
	Actual	Benchmark	
Non-Hispanic white female	7.1%	12.5%	57

Note: As the benchmark figure can only be estimated for records with an observed (rather than imputed) dependent variable, comparison is made with only this subset of the sample. For this reason, actual self-employment rates may differ slightly from those in Figure F-2.

Source: BBC Research & Consulting from statistical models of 2010-2014 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Simulation results for women in 2010 through 2014 indicated a disparity. Thirteen percent of women would own businesses in the architecture and engineering industry if gender did not have an impact on self-employment. However, the actual 2010 through 2014 self-employment rate for women was 7 percent (disparity index of 57).

Results specific to the information technology industry in the Atlanta Metropolitan Area in 2010 through 2014. Figure F-8 presents the coefficients from the probit model predicting business ownership in the information technology industry in the Atlanta Metropolitan Area in 2010 through 2014. The model indicates that one race- and gender-neutral factor was important and statistically significant in predicting the probability of business ownership in the information technology industry. Specifically, being married is associated with a lower likelihood of business ownership.

After controlling for race- and gender-neutral factors, a statistically significant difference persisted in the rates of business ownership for women working in the Atlanta Metropolitan Area IT industry.

Figure F-8.
Information technology industry business ownership model 2010 through 2014
Dependent Variable: Business Ownership

Note: *, ** Denote statistical significance at the 90% and 95% confidence levels, respectively.

Source: BBC Research & Consulting from 2010-2014 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Variable	Coefficient
Constant	-1.3914 *
Age	0.0049
Age-squared	0.0001
Married	-0.3081 **
Number of children in household	0.0593
Number of people over 65 in household	0.1549
Owns home	-0.0740
Home value ($000s)	0.0000
Monthly mortgage payment ($000s)	0.0000
Interest and dividend income ($000s)	0.0000
Income of spouse or partner ($000s)	0.0000
Speaks English well	0.0371
Disabled	0.1339
Less than high school education	0.6680
Some college	0.0153
Four-year degree	-0.1234
Advanced degree	-0.2017
Hispanic American	-0.1374
African American	-0.1249
Asian-Pacific American	-0.1717
Subcontinent Asian American	-0.1274
Native American	0.7688
Other minority	-0.6836
Female	-0.1580 *

Simulations of business ownership rates. The study team simulated business ownership rates in the IT industry using the same approach as it used for the construction and A&E industries. Figure F-9 presents actual and simulated ("benchmark") business ownership rates for non-Hispanic white female workers in the information technology industry. Approximately 11 percent of women in the study area's information technology industry were business owners in 2010 through 2014 compared with a benchmark business ownership rate of about 14 percent (a disparity index of 83).

Figure F-9.
Comparison of actual business ownership rates to simulated rates
for Atlanta Metropolitan Area information technology workers, 2010-2014

Group	Self-employment rate		Disparity index (100 = parity)
	Actual	Benchmark	
Non-Hispanic white female	11.2%	13.5%	83

Note: As the benchmark figure can only be estimated for records with an observed (rather than imputed) dependent variable, comparison is made with only this subset of the sample. For this reason, actual self-employment rates may differ slightly from those in Figure F-3.

Source: BBC Research & Consulting from statistical models of 2010-2014 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.

Summary of Business Ownership in Construction, Architecture and Engineering and Information Technology in the Atlanta Metropolitan Area

Disparities in business ownership for certain minority groups and women were present in the Atlanta Metropolitan Area construction industry:

- Business ownership rates for African Americans and Hispanic Americans were substantially lower than that of non-Hispanic whites in 2010 through 2014.
- Business ownership rates for women were substantially lower than that of men in 2010 through 2014.
- After statistically controlling for a number of race- and gender-neutral factors, substantially fewer women owned businesses than similarly-situated men in 2010 through 2014.

The study team also identified disparities in business ownership in the architecture and engineering industry in the Atlanta Metropolitan Area in 2010 through 2014:

- Business ownership rates for African Americans were substantially lower than that of non-Hispanic whites.
- Business ownership rates for women were substantially lower than the rate for men.
- The study team used regression models to investigate the presence of race/ethnicity- and gender-based disparities in business ownership rates after accounting for race- and gender-neutral factors. The results indicated substantial disparities for women.

The study team also identified disparities in business ownership in the Atlanta Metropolitan Area information technology industry:

- Business ownership rates for African Americans, Asian-Pacific Americans and Subcontinent Asian Americans were substantially lower than that of non-Hispanic whites in 2010 through 2014.
- After statistically controlling for a number of race- and gender-neutral factors, fewer women working in IT owned businesses than similarly-situated men.

APPENDIX G.
Access to Capital for Business Formation and Success

Access to capital is one factor that researchers have examined when studying business formation and success. If race- or gender-based discrimination exists in capital markets, minorities and women may have difficulty acquiring the capital necessary to start, operate, or expand businesses.[1, 2] Researchers have also found that the amount of start-up capital can affect long-term business success, and, on average, minority- and women-owned businesses appear to have less start-up capital than non-Hispanic white-owned businesses and male-owned businesses.[3] For example:

- In 2007, 30 percent of majority-owned businesses that responded to a national U.S. Census Bureau survey indicated that they had start-up capital of $25,000 or more.[4]
- Only 17 percent of African American-owned businesses indicated a comparable amount of start-up capital, and disparities in start-up capital were identified for every other minority group except Asian Americans.
- Nineteen percent of female-owned businesses reported start-up capital of $25,000 or more compared with 32 percent of male-owned businesses (not including businesses that were equally owned by men and women).

Race- or gender-based discrimination in start-up capital can have long-term consequences, as can discrimination in access to business loans after businesses have already been formed.[5] Appendix G presents information about homeownership and mortgage lending, because home equity can be an important source of capital to start and expand businesses.

Homeownership and Mortgage Lending

BBC Research & Consulting analyzed homeownership and the mortgage lending industry to explore differences across race/ethnicity and gender that may lead to disparities in access to capital.

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[1] For example, see Mitchell, Karlyn and Douglas K. Pearce. 2005. "Availability of Financing to Small Firms Using the Survey of Small Business Finances." U.S. Small Business Administration, Office of Advocacy. 57.

[2] Fairlie, Robert W. and Alicia M. Robb. 2010. *Race and Entrepreneurial Success*. Cambridge: MIT Press.

[3] *Ibid.*

[4] Business owners were asked, "What was the total amount of capital used to start or acquire this business? (Capital includes savings, other assets, and borrowed funds of owner(s))." From U.S. Census Bureau, Statistics for All U.S. Firms by Total Amount of Capital Used to Start or Acquire the Business by Industry, Gender, Ethnicity, Race, and Veteran Status for the U.S.: 2007 Survey of Business Owners: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=SBO_2007_00CSCB16&prodType=table.

[5] Fairlie, Robert W. and Alicia M. Robb. 2010. *Race and Entrepreneurial Success*. Cambridge: MIT Press.

Homeownership. Wealth created through homeownership can be an important source of capital to start or expand a business.[6] In sum:

- A home is a tangible asset that provides borrowing power;[7]
- Wealth that accrues from housing equity and tax savings from homeownership contributes to capital formation;[8]
- Next to business loans, mortgage loans have traditionally been the second largest loan type for small businesses;[9] and
- Homeownership is associated with an estimated 30 percent reduction in the probability of loan denial for small businesses.[10]

Any barriers to homeownership and home equity growth for minorities and women can affect business opportunities by constraining their available funding. Similarly, any barriers to accessing home equity through home mortgages can also affect available capital for new or expanding businesses. The study team analyzed homeownership rates and home values before considering loan denial and subprime lending.

Homeownership rates. Many studies have documented past discrimination in the national housing market. The United States has a history of restrictive real estate covenants and property laws that affect the ownership rights of minorities and women.[11] For example, in the past, a woman's participation in homeownership was secondary to that of her husband and parents.[12] The study team used 2010-2014 American Community Survey (ACS) data to examine homeownership rates in the Atlanta Metropolitan Area.[13] Figure G-1 presents homeownership rates for minority groups and non-Hispanic whites.

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[6] The housing and mortgage crisis beginning in late 2006 has substantially impacted the ability of small businesses to secure loans through home equity. Later in Appendix G, Holland & Knight discusses the consequences of the housing and mortgage crisis on small businesses and MBE/WBEs.

[7] Nevin, Allen. 2006. "Homeownership in California: A CBIA Economic Treatise." *California Building Industry Association.* 2.

[8] Jackman, Mary R. and Robert W. Jackman. 1980. "Racial Inequalities in Home Ownership." *Social Forces.* 58. 1221-1234.

[9] Berger, Allen N. and Gregory F. Udell. 1998. "The Economics of Small Business Finance: The Roles of Private Equity and Debt Markets in the Financial Growth Cycle." *Journal of Banking and Finance.* 22.

[10] Cavalluzzo, Ken and John Wolken. 2005. "Small Business Loan Turndowns, Personal Wealth and Discrimination." *Journal of Business.* 78: 2153-2178.

[11] Ladd, Helen F. 1982. "Equal Credit Opportunity: Women and Mortgage Credit." *The American Economic Review.* 72: 166-170.

[12] Card, Emily. 1980. "Women, Housing Access, and Mortgage Credit." *Signs.* 5: 215-219.

[13] For the purposes of this study, the Atlanta Metropolitan Area corresponds to the 29 county Atlanta-Sandy Springs-Roswell, GA Metropolitan Statistical Area (MSA) as defined by the Office of Management and Budget (OMB) in 2013. Because the Census suppresses county information in the American Community Survey (ACS) data to safeguard respondent confidentiality, however, this target geography must be approximated using Public Use Microdata Areas (PUMAs). Specifically, a PUMA is assigned to the study area if and only if the majority of that PUMA's population resided in the Atlanta MSA in 2010. Note that the University of Minnesota IPUMS platform includes a derived variable — MET2013 — that directly identifies the approximated study area. Further, due to a redrawing of PUMA boundaries that took place between 2011 and 2012 in response to updated data from 2010 Census, the effective geography underlying the 2010-2011 portion of the 5-year ACS sample is slightly different from that of the 2012-2014 portion.

Figure G-1.
Homeownership rates, 2010-2014

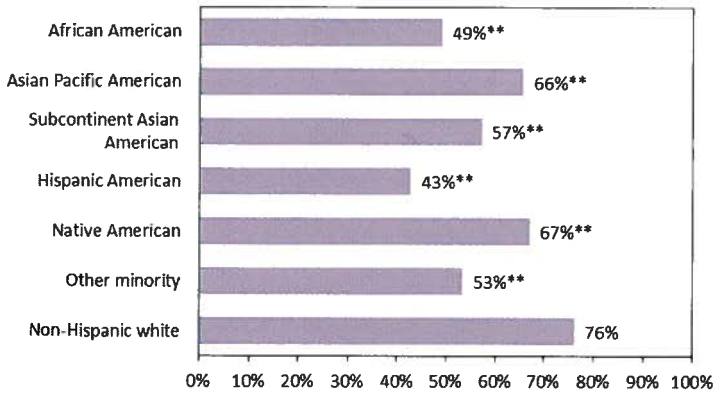
Note:

The sample universe is all households.

** Denotes that the difference in proportions from non-Hispanic white for the given year is statistically significant at the 95% confidence level.

Source:

BBC Research & Consulting from 2010-2014 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.



Disparities in homeownership rates between racial/ethnic minorities and non-minorities were apparent in 2010 through 2014.

- Approximately half (49%) of African American households were homeowners, compared to 76 percent of non-Hispanic white households;
- About 43 percent of Hispanic American households were homeowners;
- Homeownership rates for Subcontinent Asian Americans and Asian-Pacific Americans were 57 percent and 66 percent, respectively; and
- Native American households owned homes at a rate of 67 percent.

Lower rates of homeownership may reflect lower incomes for minorities. That relationship may be self-reinforcing, as low wealth puts individuals at a disadvantage in becoming homeowners, which has historically been a path to building wealth. An older study found that the probability of homeownership is considerably lower for African Americans than it is for comparable non-Hispanic whites throughout the United States.[14]

Home values. Research has shown homeownership and home values to be direct determinants of available capital to form or expand businesses.[15] Using 2010 through 2014 ACS data, the study team compared median home values by racial/ethnic group.[16] Figure G-2 presents median home values by racial/ethnic groups in the Atlanta Metropolitan Area. African Americans ($125,000), Hispanic Americans ($130,000), and Native Americans ($156,000) had substantially lower median home values

[14] Jackman. 1980. "Racial Inequalities in Home Ownership."

[15] Fairlie, Robert W. and Harry A. Krashinky. 2006. "Liquidity Constraints, Household Wealth, and Entrepreneurship Revisited." IZA Discussion Paper. No. 2201.

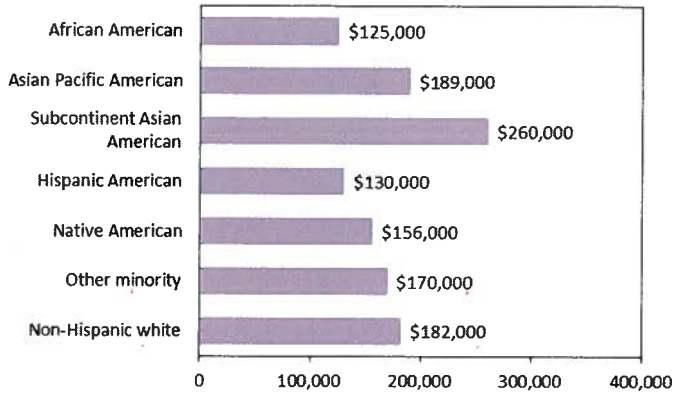
[16] The study team also examined the proportion of homeowners who own their homes free and clear but the differences among racial/ethnic groups were minimal. In addition, an analysis of home values for homes owned free and clear was not substantially different than trends reflected in the analysis of median home values for all homes by race/ethnicity.

than non-Hispanic whites ($182,000) in the Atlanta Metropolitan Area. On average, Asian-Pacific Americans and Subcontinent Asian Americans owned homes of greater value than non-Hispanic whites.

Figure G-2.
Median home values, 2010-2014

Note:
The sample universe is all owner-occupied housing units.

Source:
BBC study team from 2010-2014 American Community Survey data. The raw data extract was obtained through the IPUMS program of the MN Population Center: http://usa.ipums.org/usa/.



Mortgage lending. Minorities may be denied opportunities to own homes, to purchase more expensive homes, or to access equity in their homes if they are discriminated against when applying for home mortgages. In a recent lawsuit, Bank of America paid $335 million to settle allegations that its Countrywide Financial unit discriminated against African American and Hispanic American borrowers between 2004 and 2008. The case was brought by the Securities and Exchange Commission after finding evidence of "statistically significant disparities by race and ethnicity" among Countrywide Financial customers.[17]

The study team explored market conditions for mortgage lending in the Atlanta Metropolitan Area. The best available source of information concerning mortgage lending is Home Mortgage Disclosure Act (HMDA) data, which contain information on mortgage loan applications that financial institutions, savings banks, credit unions, and some mortgage companies receive.[18] Those data include information about the location, dollar amount, and types of loans made, as well as race/ethnicity, income, and credit characteristics of all loan applicants. The data are available for home purchases, loan refinances, and home improvement loans.

The study team examined HMDA statistics provided by the Federal Financial Institutions Examination Council (FFIEC) for 2007, 2011, and 2014. Although 2014 provides a more recent representation of the home mortgage market, the 2007 data represent a more complete data set from

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[17] Savage, Charlie. December 22, 2011. "$335 Million Settlement on Countywide Lending Bias." *NYTimes.com*. Available online at: http://www.nytimes.com/2011/12/22/business/us-settlement-reported-on-countrywide-lending.html.

[18] Depository institutions were required to report 2014 HMDA data if they had assets of more than $43 million on the preceding December 31 ($40 million for 2011 and $36 million for 2007), have a branch office in a metropolitan area, and originated at least one home purchase or refinance loan in the reporting calendar year. Non-depository mortgage companies are required to report HMDA data if they are for-profit institutions, had home purchase loan originations either a.) exceeding 10 percent of all loan obligations in the past year or b.) exceeding $25 million, are located in a Metropolitan Statistical Area (MSA; or originated five or more home purchase loans in an MSA) and either had more than $10 million in assets or made at least 100 home purchase or refinance loans in the preceding calendar year.

before the recent mortgage crisis. Many of the institutions that originated loans in 2007 were no longer in business by the 2014 reporting date for HMDA data.[19] For example, in 2007, applications were distributed among 8,610 lenders nationwide, while in 2014 the number of lenders had fallen to 7,063. In addition, the percentage of government-insured loans, which the study team did not include in its analysis, increased dramatically between 2007 and 2014, decreasing the proportion of total loans that the study team analyzed in the 2014 data.[20]

Mortgage denials. The study team examined mortgage denial rates on conventional loan applications made by high-income households. Conventional loans are loans that are not insured by a government program. High-income applicants are those households with 120 percent or more of the U.S. Department of Housing and Urban Development (HUD) area median family income.[21] Loan denial rates are calculated as the percentage of mortgage loan applications that were denied, excluding applications that the potential borrowers terminated and applications that were closed due to incompleteness.[22]

Figure G-3 presents loan denial results for the Atlanta Metropolitan Area in 2007, 2011 and 2014. Data for 2007 show higher denial rates for all groups in the Atlanta Metropolitan Area compared with 2014. African American, Asian American, Hispanic American, Native American and Native Hawaiian and other Pacific Islander high-income applicants all exhibited higher loan denial rates compared with non-Hispanic white applicants in all three years (2007, 2011 and 2014).

In 2014, loan denial rates remained higher for all minority loan applicants relative to non-Hispanic white applicants:

- The denial rate in 2014 was particularly high among African American applicants, 16 percent of whom had their applications denied, and Native Hawaiian or other Pacific Islander applicants, with a 13 percent denial rate, compared to only 7 percent of non-Hispanic white applicants.
- Loan denial rates in 2014 were also higher for Hispanic Americans, (11%), Native Americans (10%), and Asian Americans (9%) compared with non-Hispanic white applicants.

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[19] According to an article by the Federal Reserve, the volume of reported loan applications and originations fell sharply from 2007 to 2008 after previously falling between 2006 and 2007. See Avery, Brevoort, and Canner. "The 2008 HMDA Data: The Mortgage Market during a Turbulent Year." Available online at: http://www.federalreserve.gov/pubs/bulletin/2009/pdf/hmda08draft.pdf.

[20] Loans insured by government programs have surged since 2006. In 2006, about 10 percent of first lien home loans were insured by a government program. More than half of home loans were insured by the government in 2009. Source: "The 2009 HMDA Data: The Mortgage Market in a Time of Low Interest Rates and Economic Distress," *Federal Reserve Bulletin.* December 2010, pp. A39-A77.

[21] The median family income in 2014 was about $70,000 for the Atlanta-Sandy Springs-Marietta MSA (in 2014 dollars). Median family income for 2007 was $77,000 for the Atlanta-Sandy Springs-Marietta MSA (in 2014 dollars). Source: FFIEC HMDA data 2007, 2011, 2014.

[22] For this analysis, loan applications are considered to be applications for which a specific property was identified, thus excluding preapproval requests.

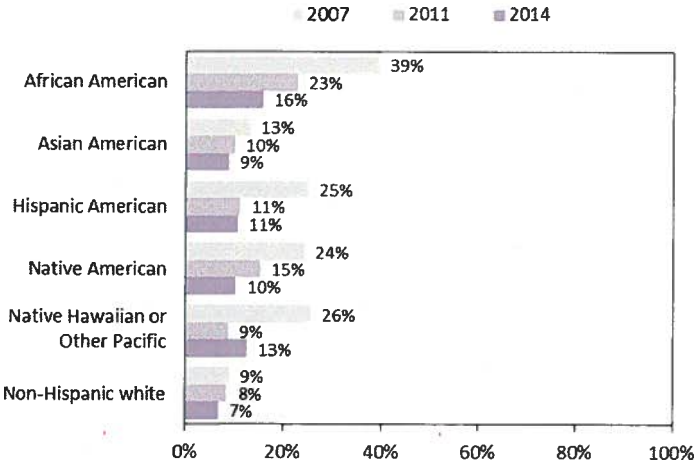
Figure G-3.
Denial rates of conventional purchase loans to high-income households, 2007, 2011 and 2014

Note:

High-income borrowers are those households with 120% or more than the HUD area median family income (MFI).

Source:

FFIEC HMDA data 2007, 2011 and 2014.



Additional research. Several national studies have examined disparities in loan denial rates and loan amounts for minorities in the presence of other influences. For example:

- A study by the Federal Reserve Bank of Boston is one of the most cited studies of mortgage lending discrimination.[23] It was conducted using the most comprehensive set of credit characteristics ever assembled for a study on mortgage discrimination.[24] The study provided persuasive evidence that lenders in the Boston area discriminated against minorities in 1990.[25]
- Using the Federal Reserve Board's 1983 Survey of Consumer Finances and the 1980 Census of Population and Housing data, analyses revealed that minority households were one-third as likely to receive conventional loans as non-Hispanic white households after taking into account financial and demographic variables.[26]
- Findings from a Midwest study indicate a relationship between race and both the number and size of mortgage loans. Data matched on socioeconomic characteristics revealed that African American borrowers across 13 census tracts received significantly fewer loans and of smaller sizes compared to their white counterparts.[27]

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[23] Munnell, Alicia H., Geoffrey Tootell, Lynn Browne and James McEneaney. 1996. "Mortgage Lending in Boston: Interpreting HMDA Data." *The American Economic Review.* 86: 25-53.

[24] Ladd, Helen F. 1998. "Evidence on Discrimination in Mortgage Lending." *The Journal of Economic Perspectives.* 12: 41-62.

[25] Yinger, John. 1995. *Closed Doors, Opportunities Lost: The Continuing Costs of Housing Discrimination.* New York: Russell Sage Foundation. 71.

[26] Canner, Glenn B., Stuart A. Gabriel and J. Michael Woolley. 1991. "Race, Default Risk and Mortgage Lending: A Study of the FHA and Conventional Loan Markets." *Southern Economic Journal.* 58: 249-262.

[27] Leahy, Peter J. 1985. "Are Racial Factors Important for the Allocation of Mortgage Money?: A Quasi-Experimental Approach to an Aspect of Discrimination." *American Journal of Economics and Sociology.* 44: 185-196.

However, other studies have found that differences in preferences for Federal Housing Administration (FHA) loans — mortgage loans that that the government insures — versus conventional loans among racial and ethnic groups may partially explain disparities found in conventional loan approvals between minorities and non-minorities.[28] Several studies have found that, historically, minority borrowers are far more likely to seek FHA loans than comparable non-Hispanic white borrowers across different income and wealth levels. The insurance on FHA loans protects the lender, but the borrower can be disadvantaged by higher borrowing costs. [29]

Subprime lending. Loan denial is only one of several ways minorities might be discriminated against in the home mortgage market. Mortgage lending discrimination can also occur through higher fees and interest rates. Subprime lending provides a unique example of such types of discrimination through fees associated with various loan types.[30]

Until recent years, one of the fastest growing segments of the home mortgage industry was subprime lending. From 1994 through 2003, subprime mortgage activity grew by 25 percent per year and accounted for $330 billion of U.S. mortgages in 2003, up from $35 billion a decade earlier. In 2006, subprime loans represented about one-fifth of all mortgages in the United States.[31] With higher interest rates than prime loans, subprime loans were historically marketed to customers with blemished or limited credit histories who would not typically qualify for prime loans. Over time, subprime loans also became available to homeowners who did not want to make a down payment, did not want to provide proof of income and assets, or wanted to purchase a home with a cost above that for which they would qualify from a prime lender.[32] Because of higher interest rates and additional costs, subprime loans affected homeowners' ability to grow home equity and increased their risks of foreclosure.

Although there is no standard definition of a subprime loan, there are several commonly-used approaches to examining rates of subprime lending. The study team used a "rate-spread method" — in which subprime loans are identified as those loans with substantially above-average interest rates — to measure rates of subprime lending in 2007, 2011, and 2014.[33] Because lending patterns and borrower motivations differ depending on the type of loan being sought, the study team separately considered home purchase loans and refinance loans. Patterns in subprime lending did not differ substantially between the different types of loans.

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[28] Canner. 1991. "Race, Default Risk and Mortgage Lending: A Study of the FHA and Conventional Loan Markets."

[29] Yinger. 1995. Closed Doors, Opportunities Lost: The Continuing Costs of Housing Discrimination. 80.

[30] See definition of subprime loans discussed on the following page.

[31] Avery, Brevoort, and Canner, "The 2006 HMDA Data." Federal Reserve Bulletin, December 2007, pp. A73-A109.

[32] Gerardi, Shapiro, and P. Willen. 2008. "Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosure." *Federal Reserve Bank of Boston.*

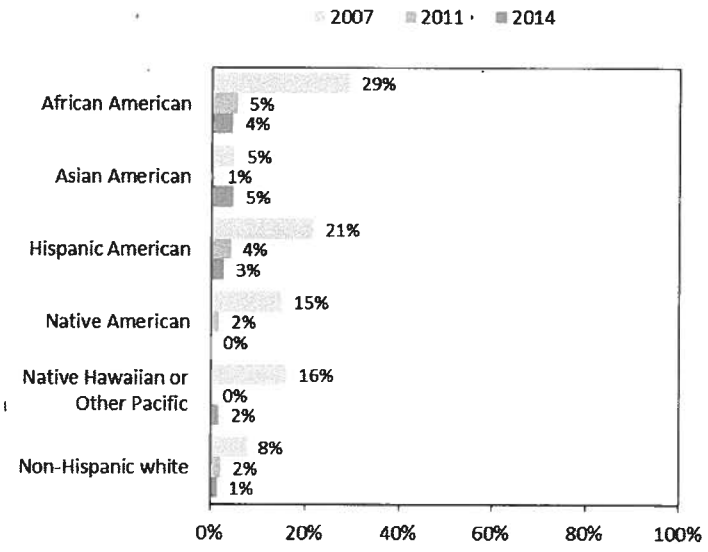
[33] Prior to October 2009, first lien loans were identified as subprime if they had an annual percentage rate (APR) that was 3.0 percentage points or greater than the federal treasury security rate of like maturity. As of October 2009, rate spreads in HMDA data were calculated as the difference between APR and Average Prime Offer Rate, with subprime loans defined as 1.5 percentage points of rate spread or more. The study team identified subprime loans according to those measures in the corresponding time periods.

Figure G-4 shows the percent of conventional home purchase loans that were subprime in the Atlanta Metropolitan Area, based on 2007, 2011, and 2014 HMDA data. The rates of subprime lending in 2011 and 2014 were dramatically lower overall than in 2007 due to the collapse of the mortgage lending market in the late 2000s.

In the Atlanta Metropolitan Area, African American and Hispanic American borrowers were more likely to receive subprime home purchase loans than non-Hispanic whites in all three years (2007, 2011, and 2014). Native Hawaiian or other Pacific Islanders were more likely than non-Hispanic whites to receive subprime loans in both 2007 and 2014; Native American borrowers were more likely than non-Hispanic whites to receive subprime loans in both 2007 and 2011; and Asian Americans were more likely than non-Hispanic whites to receive subprime loans in 2014.

Figure G-4.
Percent of conventional home purchase loans that were subprime, 2007, 2011 and 2014

Source:
FFIEC HMDA data 2007, 2011 and 2014.



Data for 2007 indicate substantial disparities for all minority groups except Asian Americans:

- About 8 percent of home purchase loans issued to non-Hispanic whites were subprime.
- By contrast, 29 percent of home purchase loans issued to African Americans were subprime.
- Over one-fifth (21%) of home purchase loans issued to Hispanic Americans were subprime.
- The percent of home purchase loans issued to Native Americans (15%) and to Native Hawaiians or other Pacific Islanders (16%) that were subprime was approximately double that of non-Hispanic whites.

Although the overall volume of subprime loans dropped substantially between 2007 and 2014, racial/ethnic disparities in subprime lending persisted:

- In 2014, fewer than 2 percent of conventional home purchase loans issued to non-Hispanic white borrowers were subprime.
- Over four percent of home purchase loans issued to both Asian Americans and African Americans were subprime.

Figure G-5 presents the percentage of home refinance loans that were subprime in the Atlanta Metropolitan Area. As with home purchase loans, the rates of subprime lending for refinance loans in 2011 and 2014 were dramatically lower than in 2007 due to the collapse of the mortgage lending market in the late 2000s.

In the Atlanta Metropolitan Area, subprime trends for refinance loans were similar to subprime trends for home purchase loans. Compared to non-Hispanic white borrowers, African Americans and Hispanic Americans were more likely to receive subprime refinance loans in 2007, 2011, and 2014; Native American borrowers were more likely to receive subprime refinance loans in both 2007 and 2014; and Native Hawaiian or Other Pacific Islanders were more likely to receive subprime refinance loans in 2007.

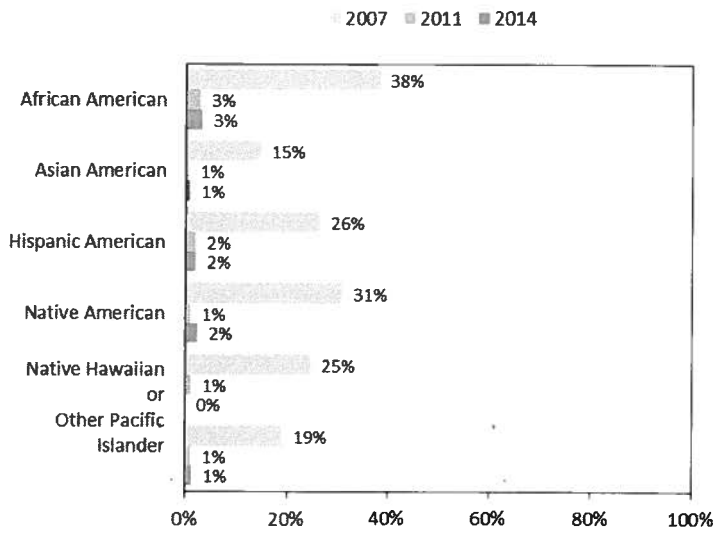
In 2007, about 38 percent of refinance loans issued to African Americans, 26 percent of refinance loans issued to Hispanic Americans, 31 percent of refinance loans issued to Native Americans, and 25 percent of refinance loans to Native Hawaiian or other Pacific Islanders were subprime. In contrast, only 19 percent of refinance loans issued to non-Hispanic whites in 2007 were subprime.

By 2014, subprime loans made up a much smaller proportion of the total conventional home refinance loans issued in that year (in the Atlanta Metropolitan Area). The decrease in subprime refinance loans was evident for all racial/ethnic groups in the Atlanta Metropolitan Area, but most minority households that received refinance loans in 2014 were still somewhat more likely than non-Hispanic whites to be issued subprime loans.

- Approximately 2 percent of conventional home refinance loans issued to Hispanic American and Native American borrowers were subprime, compared to 1 percent for non-Hispanic white borrowers.
- About 3 percent of home refinance loans issued to African American borrowers were subprime — the highest of any racial/ethnic group included in the analysis.

Figure G-5.
Percent of conventional refinance loans that were subprime, 2007, 2011 and 2014

Source:
FFIEC HMDA data 2007, 2011 and 2014.



Additional research. Some evidence suggests that lenders sought out and offered subprime loans to individuals who often would not be able to pay off the loan, a form of "predatory lending."[34] Furthermore, some research has found that many recipients of subprime loans could have qualified for prime loans.[35] Previous studies of subprime lending suggest that predatory lenders have disproportionately targeted minorities. A 2001 HUD study using 1998 HMDA data found that subprime loans were disproportionately concentrated in African American neighborhoods compared with white neighborhoods, even after controlling for income.[36] For example, borrowers in higher-income African American neighborhoods were six times more likely to refinance with subprime loans than borrowers in higher-income white neighborhoods.

Implications of the recent mortgage lending crisis. The turmoil in the housing market since late 2007 has been far-reaching, resulting in the loss of home equity, decreased demand for housing, and increased rates of foreclosure.[37] Much of the blame has been placed on risky practices in the mortgage industry including substantial increases in subprime lending. As discussed above, the number of subprime mortgages increased at an extraordinary rate between the mid-1990s and mid-2000s. Those high-cost, high-interest loans increased from 8 percent of originations in 2003 to 20 percent in 2005 and 2006.[38] The preponderance of subprime lending is important because

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[34] Department of Housing and Urban Development (HUD) and the Department of Treasury. 2001. HUD-Treasury National Predatory Lending Task Force Report. *HUD*; Carr, J. and L. Kolluri. 2001. Predatory Lending: An Overview. *Fannie Mae Foundation*; and California Reinvestment Coalition, Community Reinvestment Association of North Carolina, Empire Justice Center, Massachusetts Affordable Housing Alliance, Neighborhood Economic Development Advocacy Project, Ohio Fair Lending Coalition and Woodstock Institute, 2008. "Paying More for the American Dream."

[35] Freddie Mac. September, 1996. "Automated Underwriting: Making Mortgage Lending Simpler and Fairer for America's Families." *Freddie Mac.* (accessed February 5, 2007); and Lanzerotti. 2006. "Homeownership at High Cost: Foreclosure Risk and High Cost Loans in California." *Federal Reserve Bank of San Francisco.*

[36] Department of Housing and Urban Development (HUD) and the Department of Treasury. 2001.

[37] Joint Center for Housing Studies of Harvard University. 2008. "The State of the Nation's Housing."

[38] *Ibid.*

households that are repaying subprime loans have a greater likelihood of delinquency or foreclosure. A 2008 study released from the Federal Reserve Bank of Boston found that "homeownerships that begin with a subprime purchase mortgage end up in foreclosure almost 20 percent of the time, or more than six times as often as experiences that begin with prime purchase mortgages."[39]

Such problems substantially impact the ability of homeowners to secure capital through home mortgages to start or expand small businesses. That issue has been highlighted in statements made by members of the Board of Governors of the Federal Reserve System to the U.S. Senate and U.S. House of Representatives:

- On April 16, 2008, Frederic Mishkin informed the U.S. Senate Committee on Small Business and Entrepreneurship that "one of the most important concerns about the future prospects for small business access to credit is that many small businesses use real estate assets to secure their loans. Looking forward, continuing declines in the value of their real estate assets clearly have the potential to substantially affect the ability of those small businesses to borrow. Indeed, anecdotal stories to this effect have already appeared in the press."[40]
- On November 20, 2008, Randall Kroszner told the U.S. House of Representatives Committee on Small Business that "small business and household finances are, in practice, very closely intertwined. [T]he most recent Survey of Small Business Finances (SSBF) indicated that about 15 percent of the total value of small business loans in 2003 was collateralized by 'personal' real estate. Because the condition of household balance sheets can be relevant to the ability of some small businesses to obtain credit, the fact that declining house prices have weakened household balance-sheet positions suggests that the housing market crisis has likely had an adverse impact on the volume and price of credit that small businesses are able to raise over and above the effects of the broader credit market turmoil."[41]

Federal Reserve Chairman Ben Bernanke recognized the reality of those concerns in a speech titled "Restoring the Flow of Credit to Small Businesses" on July 12, 2010.[42] Bernanke indicated that small businesses have had difficulty accessing credit and pointed to the declining value of real estate as one of the primary obstacles.

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[39] Gerardi, Shapiro, and P. Willen. 2008. "Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosure. *Federal Reserve Bank of Boston.*

[40] Mishkin, Frederic. 2008. "Statement of Frederic S. Mishkin, Member, Board of Governors of the Federal Reserve System before the Committee on Small Business and Entrepreneurship, U.S. Senate on April 16."

[41] Kroszner, Randall. 2008. "Effects of the financial crisis on small business." *Testimony before the Committee on Small Business, U.S. House of Representative on November 20.*

[42] Bernanke, Ben. 2010. Restoring the Flow of Credit to Small Businesses. *Presented at the Federal Reserve Meeting Series: Addressing the Financing Needs of Small Businesses on July 12.*

Furthermore, the National Federation of Independent Business (NFIB) conducted a national survey of 751 small businesses in late 2009 to investigate how the recession impacted access to capital.[43, 44] NFIB concluded that "falling real estate values (residential and commercial) severely limit small business owner capacity to borrow and strains currently outstanding credit relationships." Survey results indicated that 95 percent of small business employers owned real estate and 13 percent held "upside-down" property — that is, property for which the mortgage is worth more than its appraised value.

Another study analyzed the Survey of Consumer Finances to explore racial/ethnic disparities in wealth and how those disparities were impacted by the recession.[45] The study showed that there are substantial wealth disparities between African Americans and whites as well as between Hispanics and whites and that those wealth disparities worsened between 1983 and 2010. In addition to growing over time, the wealth disparity also grows with age — whites are on a higher accumulation curve than African Americans or Hispanics. The study also reports that the 2007 through 2009 recession exacerbated wealth disparities, particularly for Hispanics.

Opportunities to obtain business capital through home mortgages appear to be limited especially for homeowners with little home equity. Furthermore, the increasing rates of default and foreclosure, especially for homeowners with subprime loans, reflect shrinking access to capital available through such loans. Those consequences are likely to have a disproportionate impact on minorities in terms of both homeownership and the ability to secure capital for business start-up and growth.

Redlining. Redlining refers to mortgage lending discrimination against geographic areas associated with high lender risk. Those areas are often racially determined, such as African American or mixed-race neighborhoods.[46] That practice can perpetuate problems in already poor neighborhoods.[47] Most quantitative studies have failed to find strong evidence in support of geographic dimensions of lender decisions. Studies in Columbus, Ohio; Boston, Massachusetts; and Houston, Texas found that racial differences in loan denial had little to do with the racial composition of a neighborhood but rather with the individual characteristics of the borrower.[48] Some studies found that the race of an applicant — but not the racial makeup of the neighborhood — to be a factor in loan denials.

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[43] The study defined a small business as a business employing no less than one individual in addition to the owner(s) and no more than 250 individuals.

[44] National Federation of Independent Business (NFIB). 2010. Small Business Credit in a Deep Recession.

[45] McKernan, Signe-Mary, Caroline Ratcliffe, Eugene Steverle and Sisi Zhang. 2013. "Less Than Equal: Racial Disparities in Wealth Accumulation." Urban Institute.

[46] Holloway, Steven R. 1998. "Exploring the Neighborhood Contingency of Race Discrimination in Mortgage Lending in Columbus, Ohio." *Annals of the Association of American Geographers.* 88: 252-276.

[47] Ladd, Helen F. 1998. "Evidence on Discrimination in Mortgage Lending." *The Journal of Economic Perspectives.* 12: 41-62.

[48] See Holloway. 1998. "Exploring the Neighborhood Contingency of Race Discrimination in Mortgage Lending in Columbus, Ohio."; Tootell. 1996. "Redlining in Boston: Do Mortgage Lenders Discriminate Against Neighborhoods?"; and Holmes, Andrew and Paul Horvitz. 1994. "Mortgage Redlining: Race, Risk, and Demand." *The Journal of Finance.* 49: 81-99.

Studies of redlining have primarily focused on the geographic aspect of lender decisions. However, redlining can also include the practice of restricting credit flows to minority neighborhoods through procedures that are not observable in actual loan decisions. Examples include branch placement, advertising, and other pre-application procedures.[49] Such practices can deter minorities from starting businesses. Locations of financial institutions are important to small business start-up because local banking sectors often finance local businesses.[50] Redlining practices would deny that resource to minorities.

Steering by real estate agents. Historically, differences in the types of loans that are issued to minorities have also been attributed to "steering" by real estate agents, who serve as an information filter.[51] Despite the fact that steering has been prohibited by law for many decades, some studies claim that real estate brokers provide different levels of assistance and different information on loans to minorities than they do to non-minorities.[52] Such steering can affect the perception of minority borrowers about the availability of mortgage loans.

Gender discrimination in mortgage lending. Relatively little information is available on gender-based discrimination in mortgage lending markets. Historically, lending practices overtly discriminated against women by requiring information on marital and childbearing status. Perceived risks associated with granting loans to women of childbearing age and unmarried women resulted in "income discounting," limiting the availability of loans to women.[53]

The Equal Credit Opportunity Act in 1973 suspended such discriminatory lending practices. However, certain barriers affecting women have persisted after 1973 in mortgage lending markets. For example, there is some past evidence that lenders under-appraised properties for female borrowers.[54]

Summary

There is evidence that minorities and women continue to face certain disadvantages in accessing capital that is necessary to start, operate, and expand businesses. Capital is required to start companies, so barriers accessing capital can affect the number of minorities and women who are able to start businesses. In addition, minorities and women start business with less capital (based on national data). A number of studies have demonstrated that lower start-up capital adversely affects prospects for those businesses.

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[49] Yinger, John. 1995. "Closed Doors, Opportunities Lost: The Continuing Costs of Housing Discrimination." Russell Sage Foundation. New York. 78-79.

[50] Holloway. 1998. "Exploring the Neighborhood Contingency of Race Discrimination in Mortgage Lending in Columbus, Ohio."

[51] Kantor, Amy C. and John D. Nystuen. 1982. "De Facto Redlining a Geographic View." *Economic Geography.* 4: 309-328.

[52] Yinger. 1995. Closed Doors, Opportunities Lost: The Continuing Costs of Housing Discrimination. 78-79.

[53] Card. 1980. "Women, Housing Access, and Mortgage Credit."

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Key results included the following:

- Home equity is an important source of funds for business start-up and growth. Fewer African Americans, Asian-Pacific Americans, Subcontinent Asian Americans, Hispanic Americans and Native Americans in the Atlanta Metropolitan Area own homes compared with non-Hispanic whites. African Americans, Hispanic Americans and Native Americans who do own homes tend to have lower home values.
- High income African American, Asian American, Hispanic American and Native American households applying for conventional home mortgages in the Atlanta Metropolitan Area were more likely than non-Hispanic whites to have their applications denied (in 2007, 2011 and 2014).
- African American and Hispanic American mortgage borrowers in the Atlanta Metropolitan Area were more likely than non-Hispanic whites to be issued subprime home purchase and refinance loans in 2007, 2011 and 2014. Native Americans and Native Hawaiians or other Pacific Islanders were also more likely to receive subprime loans during the study period.