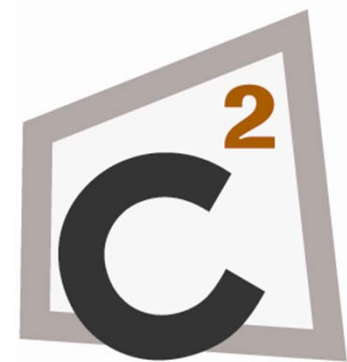




Broadband Adoption Analysis

Massachusetts Broadband Institute

June 30, 2014



c squared strategy



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Executive Summary



Background

The **Massachusetts Broadband Institute** (MBI) is a subsidiary of the Massachusetts Technology Collaborative (MTC). MTC is an independent public instrumentality of the Commonwealth of Massachusetts to serve as a catalyst for growing its innovation economy.

The primary mission of MBI is to extend affordable, robust, high-speed Internet access to all homes, businesses, schools, libraries, medical facilities, government offices and other public places across Massachusetts, with a focus on the hard-to-serve areas of western and central Massachusetts. In addition, MBI is developing a plan to promote statewide broadband adoption and digital inclusion particularly in low income and low adoption communities. It is looking to collect and analyze data as it relates to the use and adoption of broadband services in the State of Massachusetts (MA) and specifically within its 26 Gateway Cities plus Boston and Cambridge

Objective

MBI's objective for this project is to analyze and document trends in the adoption of computers and internet broadband by MA residents, specifically looking at broadband adoption demographics, data and adoption barriers. MBI intends to use this information as a baseline for further analysis and initiatives to improve broadband adoption levels throughout the State.

Key Project Challenge

Using as our primary resources data from the US Census and the National Telecommunications Information Association (NTIA) over a time period ranging from 2010 – 2013, we were able to access and utilize the best available information on broadband adoption. Because of when their surveys and reports were conducted and written, the bulk of the data reflects information and analysis collected in 2010, 2011 and 2012. We have done our best to reconcile and highlight this information and believe, where noted, that appropriate sample sizes and confidence levels met our analysis expectations for consistency and accuracy.



Report Highlights

- Internet adoption in the country has improved dramatically over the last 15 years, as 85% of U.S. adults are using the internet and 72% of all individuals have broadband access at home in 2012.
- The dramatic growth in mobile devices specifically smartphones and tablets has increased the level of internet access for many segments of our population, as 63% of those aged 18+ have used the Internet on a mobile device.
- Despite this broad level of adoption, approximately 15% of the U.S. population is not online. The primary reasons, which have changed little in the past 5 years are due to: 1) relevance (lack of need or interest, etc.), 2) usability (don't have skills, difficulty, frustration, etc.) , and 3) price (affordability).
- The primary attributes that collectively help shape the likelihood of a household using broadband at home as documented by Pew and the NTIA continue to be: ethnicity, income, education and age.
- Massachusetts has a 2012 household broadband adoption rate of 79%.
- In 2011, 1.6 million Massachusetts individuals aged 3+ did not access the internet either inside or outside the home.
- Asian Americans in Massachusetts have the highest use of broadband at 90% while Hispanics have the lowest at 58%.
- Massachusetts Gateway City adoption in 2011 (the period in which data is available) ranged from 62% in Springfield to 78% in Attleboro.
- 2011 adoption in non-Gateway City communities ranged from 74.9% in Greenfield/Athol to 85.2% in Acton/Concord/Sudbury, which is the highest area adoption rate in all of Massachusetts.

Sources



The methodology for this report focused on collecting and analyzing data from multiple data sources and additional third party reports.

Sources:

- NTIA Exploring the Digital Nation – America’s Emerging Online Experience 2013
- NTIA Exploring the Digital Nation – Computer and Internet Use at Home 2011
- PEW Research Center Internet and American Life Project – Who’s not online and Why? 2013
- PEW Research Center Internet and American Life Project- Home Broadband 2013
- PEW Research Center Internet and American Life Project – Spring Tracking Survey May 2013
- U.S. Census Bureau and U.S. Bureau of Labor Statistics Current Population Survey (CPS) 2010, 2011, 2012
- U.S. Census Bureau 2010-2012 American Community Survey (ACS), 3-Year Estimates
- Public Library Funding & Technology Access Study 2011–2012
- Massachusetts Library Service and Technology Act Evaluation (2008 – 2012) Prepared by Himmel & Wilson, Library Consultants 2012



Sources continued

- Institute for Museum and Library Services (IMLS) - Who's in the Queue? A Demographic Analysis of Public Access Computer Users and Uses in U.S. Public Libraries June 2011
- Massachusetts Long Range Plan 2013-2017 - Massachusetts Board of Library Commissioners June 2012
- Adoption of Information & Communications Technologies in the United States: Narrowing Gaps , New Challenges – John B. Horrigan PhD August 2013
- FCC Broadband Project Report 2012-2013
- The Public Library Funding & Technology Access Survey by the Information Policy and Access Center at the University of Maryland May 2012
- KPCB Internet Trends - Mary Meeker May2014



National Trends

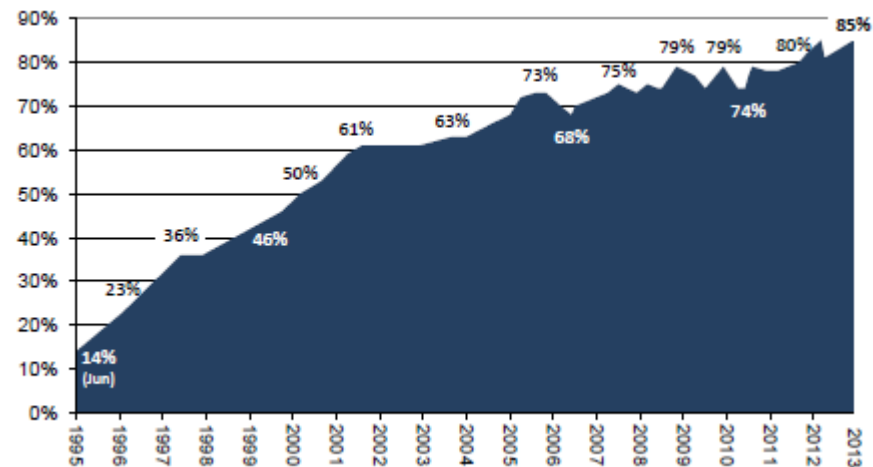


U.S. Internet Adoption Trend

In a May, 2013 survey by Pew, all but 15% of American adults (ages 18+) use the internet.

- Internet usage held relatively stable around 80% in 2009-2012 years but since grew to 85% in 2013.
- From 1995 to 2013, internet adoption has grown at an 11.2% compound annual growth rate (CAGR)
- While almost 9 of every 10 adults were using the Internet, four attributes – Race/Ethnicity, Household Income, Educational attainment and Age remain key factors in achieving overall adoption

Internet Adoption Among American Adults (Ages 18+) 1995-2013 ¹

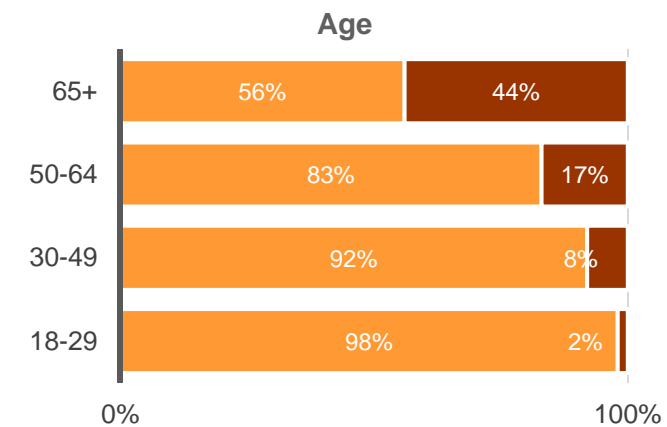
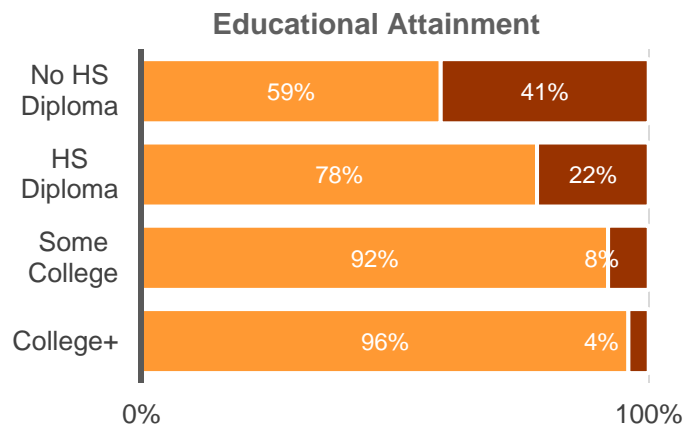
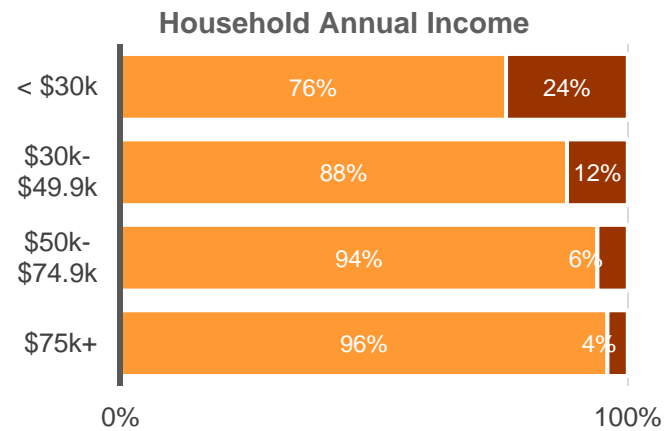
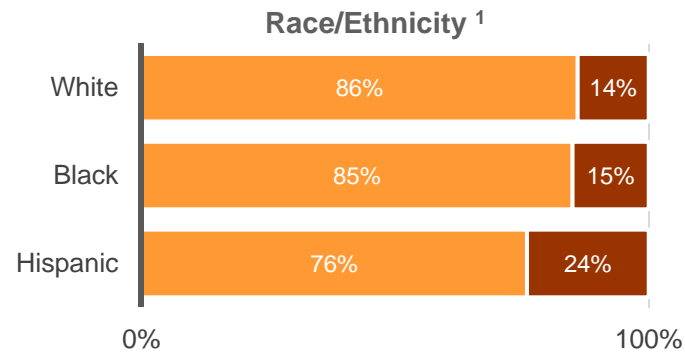


¹ Data through May, 2013
SOURCE: Pew Research Surveys

2013 U.S. Internet Adoption By Demographic Attributes



2013 Internet adoption by key demographic attributes (for adults aged 18+):



■ Online (uses internet) ■ Offline (doesn't use)

¹ The Pew source used for race information does not include statistics on Asians
 SOURCE: Pew Research Center, 'Internet & American Life Project Spring Tracking Survey', April 17 – May 19, 2013; Includes adults aged 18+

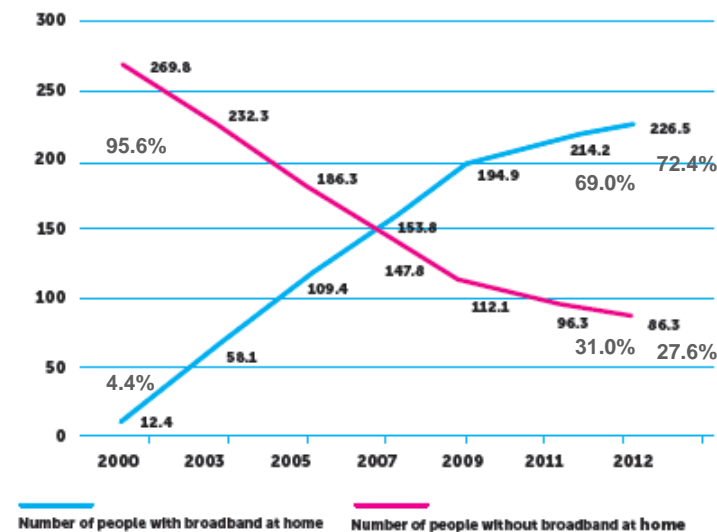


Trend of U.S. Broadband Adoption

Over 72% of Americans (all ages) had broadband at home in 2012. (Note: data presented at individual vs. household level)

- In seven years from 2000-2007 the number of individuals (vs. households) with broadband at home rose from 12 million to 153 million
- There was a steady decline of roughly 15-20% of people without broadband at home from 2000-2005
- In 2012, 86 million people had no broadband at home, down from 269 million in 2001

American Individuals With And Without Broadband At Home (millions)

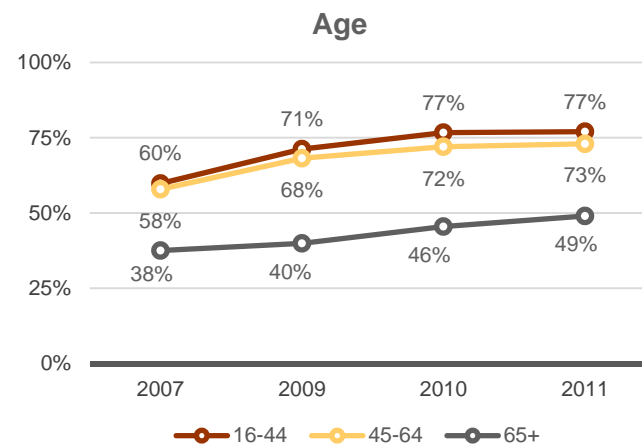
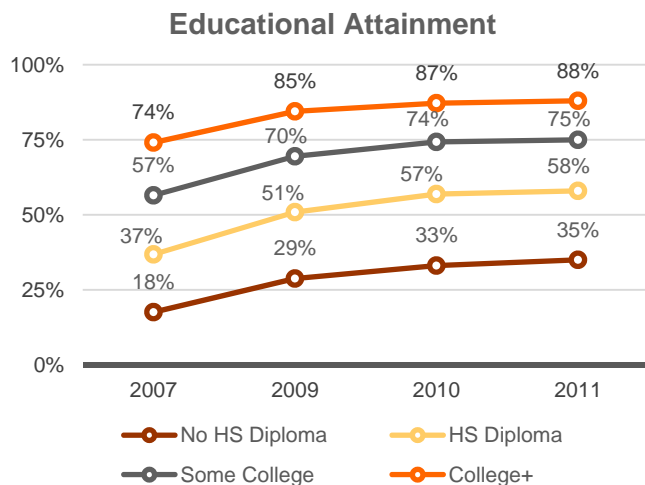
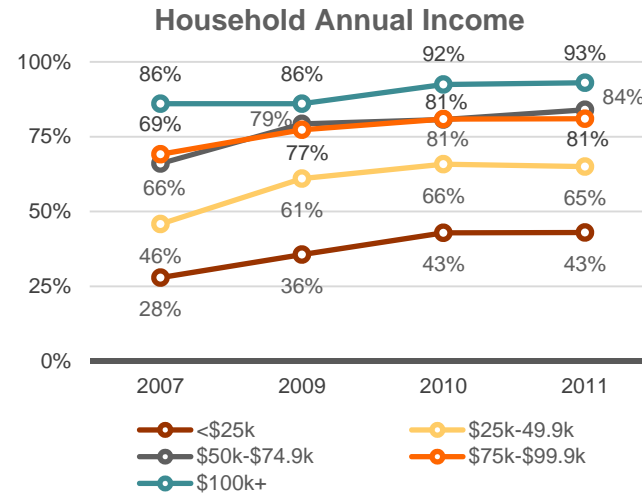
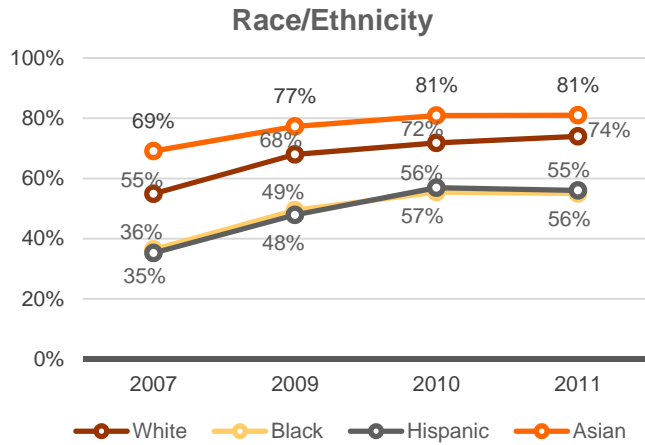


SOURCE: 'Adoption of Information & Communications Technologies in the United States: Narrowing Gaps, New Challenges', John B. Horrigan, PhD August 2013

Trend of U.S. Broadband Adoption By Demographic Attributes



U.S. Broadband adoption for adults aged 18+ by major demographic attributes from 2007-2011:



SOURCE: Adoption of Information & Communications Technologies in the United States: Narrowing Gaps, New Challenges', John B. Horrigan, PhD August 2013

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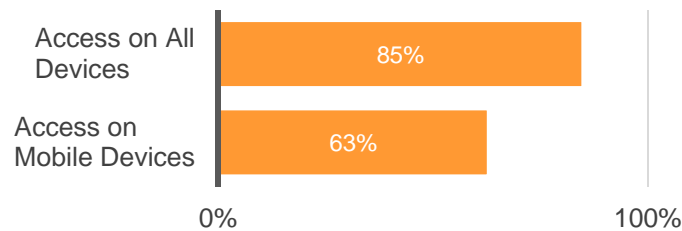
Trend of U.S. Adoption By Device

Adoption of smartphones and tablets has grown dramatically over recent years among adults aged 18+. (Note: data presented at individual, vs. household, level)

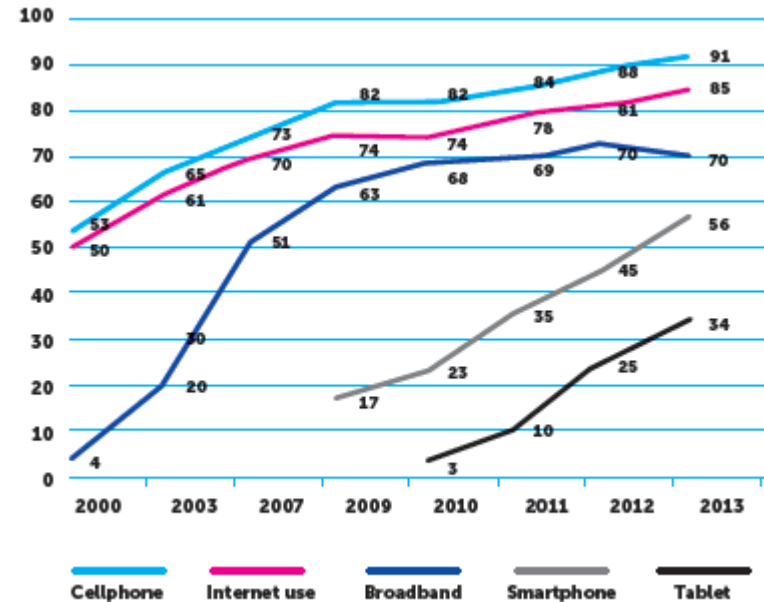
As of 2013,

- 63% have accessed the Internet using a smartphone, tablet or a handheld device
- 39% of low-income Americans (households <\$20k) have smartphones
- 83% of people with broadband at home also have a smartphone or tablet

% of American Adults Aged 18+ Accessing Internet via Mobile (2013)



% of American Adults Adopting Selected Information and Communication Technologies from 2000 to 2013



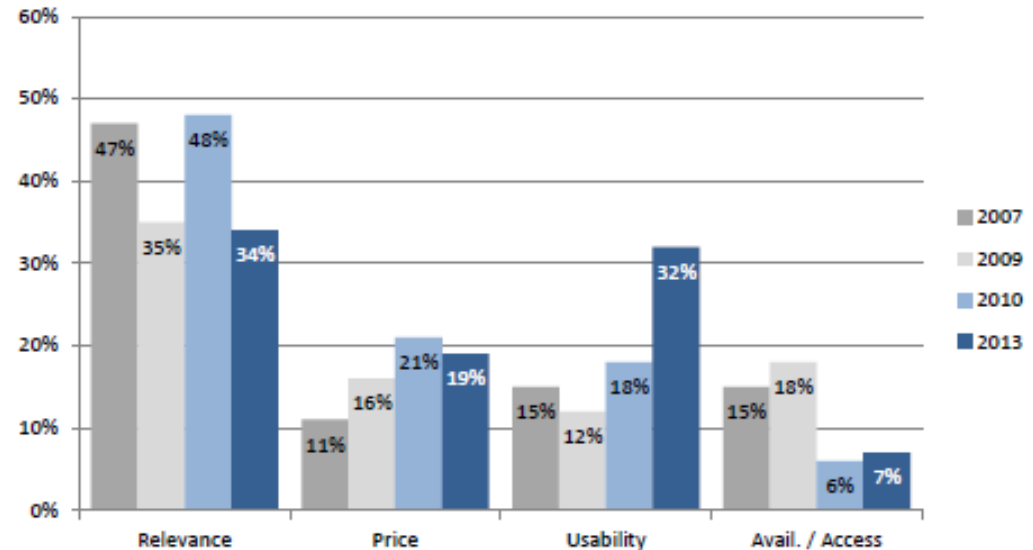
SOURCES: 'Adoption of Information & Communications Technologies in the United States: Narrowing Gaps, New Challenges', John B. Horrigan, PhD, August 2013; Pew Research Center, 'Internet & American Life Project Spring Tracking Survey', April 17 – May 19, 2013; Includes adults aged 18+



U.S. Barriers to Internet Adoption

- While relevance remains a barrier over the last 5 years, it's margin versus usability declined in 2013
- Both price and usability remain high barriers with a 14% increase in usability as a barrier reported in 2013 vs 2012
- Availability and access are less of a barrier today with the proliferation of smartphones
- 56% of adults have one smartphone

Trend | Main reason U.S. offline adults (aged 18+) don't use the internet or email



Source: Pew Research Center's Internet & American Life Project Surveys.

2013 U.S. and Massachusetts Barriers to Internet Adoption



- 66% of U.S. adults who don't use the internet cite relevance and usability as the primary reasons for not going online
- In 2011 (the last year for which this data was collected by CPS), for 604,000 Massachusetts households with no internet or high speed internet use, the top three reasons were:
 - 53% felt they didn't need it
 - 23% felt it was too expensive
 - 13% had no computer

Summary of Reasons U.S. Adults Don't use the Internet

Relevance (not interested + waste of time + too busy + don't need/want)	34%
Usability (difficult/frustrating + too old + don't know how + physically unable + worried about virus/spam/hackers/etc)	32%
Price (too expensive + don't have computer)	19%
Lack of availability/ Access	7%

SOURCE: US Census Current Population Survey 2012; Pew Research Center, 'Internet & American Life Project Spring Tracking Survey', April 17 – May 19, 2013; Includes adults aged 18+

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Broadband, Device, and Internet Adoption

Massachusetts



Sample Size

- For purposes of our state-level broadband, internet, and cell phone adoption analysis, we have used the October 2012 Internet and Computer Use Survey (the 'Survey') conducted by the U.S. Census Bureau as a supplement to its 2012 Current Population Survey
- The Survey included 2073 records of Massachusetts individuals, representing 835 distinct **Households*** (excluding households identified as 'Group Quarters', such as nursing homes, dormitories, etc.);
- Each Household is represented by a **Reference Person***, or primary **Householder***, and, except for cell phone ownership and usage, we used these 835 Householders and related Households as the sample for our calculations on broadband adoption, internet usage, and demographics
- For purposes of calculating cell phone ownership and usage, we used a sample of 682 records, which represent those Householders who also were the Survey's **Primary Respondent***
- With only 18 records of rural households in the 2012 CPS Survey, there is insufficient data with which to appropriately determine rural broadband adoption. For a general perspective on rural vs. urban adoption, we have provided in this section rural and urban adoption for the U.S. for 2011 (the most recent year for which this data is published). Note, however, that Massachusetts rural and urban adoption may or may not be similar to the U.S.

* See '**Terms**' slide for definition



Methodology

- **Weightings:** The Census calculates weights for a sample Household and Primary Respondent that reflect the number of actual persons that Householder or Respondent represent in a state's population:
 - For determining **Household** (broadband adoption, income, internet usage, computer ownership) and **Householder** (race, education, age) related statistics – we have applied the Census' household weighting
 - For determining **Primary Respondent**-related statistics – such as an individual's cell phone ownership and usage, we have applied the Census' respondent weighting
- **Race/Ethnicity:** The sample includes several Householders identified as having multiple races/ethnicities. For such **Householders**, we have identified his/her race/ethnicity as the first one listed in the related detailed race/ethnicity category assigned by the Census.
 - Any **Householder** identified as Hispanic – whether also identified as White, Black, or Asian -are considered Hispanic for purposes of our demographic analysis
 - Pacific Islanders are included in the Asian race category
- **Education Attainment:** Householders with an Associate Degree are considered to have attained 'Some College' for purposes of our demographic analysis; High school also includes GED
- **Household Income:** Represents the combined income of all family members during the past 12 months.

Terms



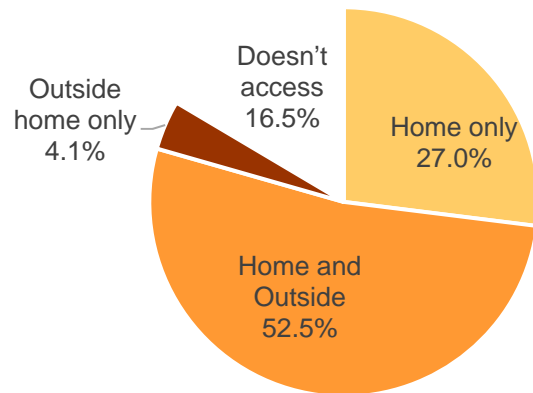
Household	<p>Consists of all the persons who occupy a house, an apartment, other group of rooms, or room which constitute a housing unit.</p> <p>A group of rooms or a single room is regarded as a housing unit when it is occupied as separate living quarters; that is, when the occupants do not live with any other person in the structure and when there is direct access from the outside or through a common hall. Households exclude group quarters, such as military barracks and institutions.</p>
Householder	<p>Refers to the person (or one of the persons) in whose name the housing unit is owned or rented, or if there is no such person, any adult 15-years of age or older (excluding roomers, boarders, or paid employees). If the house is owned or rented by a married couple, the Householder may be either of the spouses. The term Householder can be considered similar to Head of Household.</p>
Reference Person	<p>Represents the person designated as the Householder and to whom the relationship of all other household members, if any, is recorded.</p>
Primary Respondent	<p>The Primary Respondent is the person answering the survey. This person either is the Householder or speaking with respect to the Householder. Questions that are individual in nature, such as cell phone ownership and usage, are determined at the Primary Respondent level.</p>

Massachusetts Householders Use of The Internet Inside and Outside the Home



- **84%** of Massachusetts Householders use the internet either inside and outside the home while **17%** do not use it at all (percentages do not add to 100% due to rounding)
- Email and Consumer Services (e.g. online shopping) are the most popular online activities, with **80%** and **60%** using, respectively
- **33%** and **28%** of Householders use the internet for Education and Job Seeking/Training, respectively

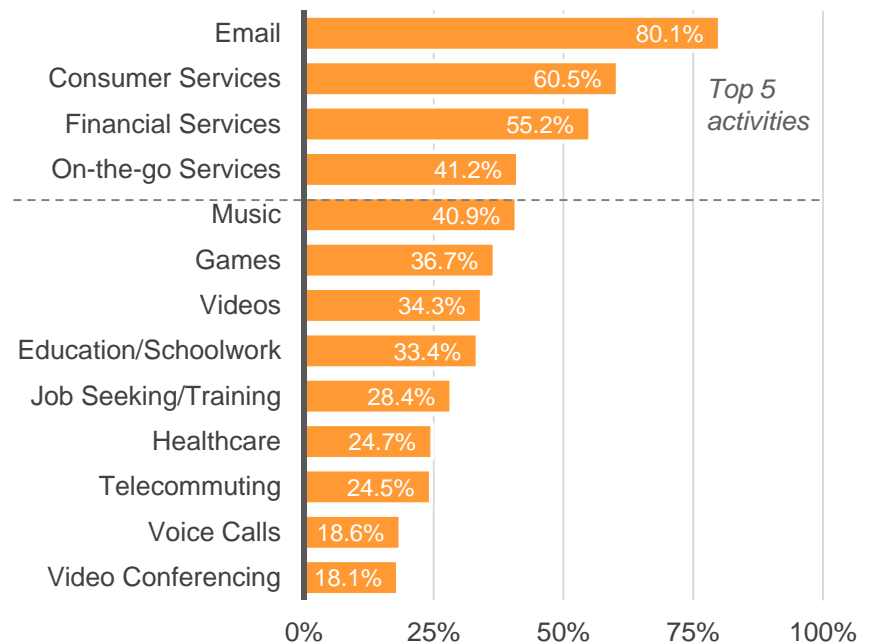
Where Mass. Householders Access/Use the Internet (2012) ¹



2011 Internet Use Among Massachusetts individuals aged 3+ (vs. Householders):

- **6.3 million** total individuals
- **4.7 million** use the internet at home and/or elsewhere
- **1.6 million** do not use at all
- **26%** of individuals do not use the internet

What Mass. Primary Respondents Are Using the Internet For - % Using (2012) ²



¹ Based on weightings of Households/Householders in sample

² Based on weightings of individual Primary Respondents from households where the internet is used inside and/or outside the home

SOURCES: US Census Current Population Survey: Internet and Computer Use Supplement 2012 and 2011

MA Internet Usage Is Highest Among Asian Americans and Those Earning More than \$50K



Race

- As with device ownership, Asian American Householders have the highest rate of internet usage at 93%
- African-American and Hispanics have the highest rate of internet use outside of the home
- Hispanic Householders have the lowest rates of internet usage (70%)
- 78% of African Americans use the internet, while 22% do not use it at all

Household Income:

- Internet usage exceeds 95% for Households with annual income of at least \$50,000
- It is far lower for Households making less than \$50,000 per year: Only 61% of those making less than \$25,000 and 75% of those making between \$25,000 and \$50,000 use the internet

Massachusetts 2012 Internet Usage:

Householder Characteristic	Where Householders Use the Internet ¹			Total that Use	Total that Don't Use
	In Home Only	Out of Home Only	Both In & Out of Home		
Massachusetts	27.0%	4.1%	52.5%	83.5%	16.5%
U.S.	-- not yet published --				
Race and Ethnicity					
White	28.3%	2.7%	53.8%	84.9%	15.1%
African American	24.9%	14.6%	38.4%	77.9%	22.1%
Hispanic	17.9%	12.1%	39.6%	69.6%	30.4%
Asian	25.0%	0.0%	67.8%	92.7%	7.3%
Amer Indian/Alaska Native/Other	-- None in sample --				
Household Annual Income:					
< \$25,000	27.7%	9.0%	23.7%	61.3%	39.7%
\$25,000 - \$49,999	35.2%	4.4%	35.9%	75.5%	24.5%
\$50,000 - \$74,999	31.3%	1.2%	62.6%	95.1%	4.9%
\$75,000 - \$99,999	24.8%	4.3%	69.6%	98.7%	1.3%
\$100,000+	17.3%	0.9%	81.3%	99.5%	0.5%

¹ Demographics are determined and weighted at the Householder/Household level
 SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012

MA Internet Usage Also Increases With Education and Decreases With Age



Education

- Householders with a college degree are twice as likely to use the internet as those without a high school diploma
- One in seven (14%) Householder internet users who have not attained a high school degree use the internet solely outside of home (7% of those using outside of home, as a portion of the 48% who access the internet). This compares to 1% of those with a college degree or more

Age

- 95% of Householders under age 45 use the internet, whether from inside or outside the home
- 41% of Householders at least 65 years old do not use the internet at all
- A large majority (70%) of Householders under 45 years old use the internet both inside and outside the home while only a small portion (20%) of those 65 years old and older do so

Massachusetts 2012 Internet Usage:

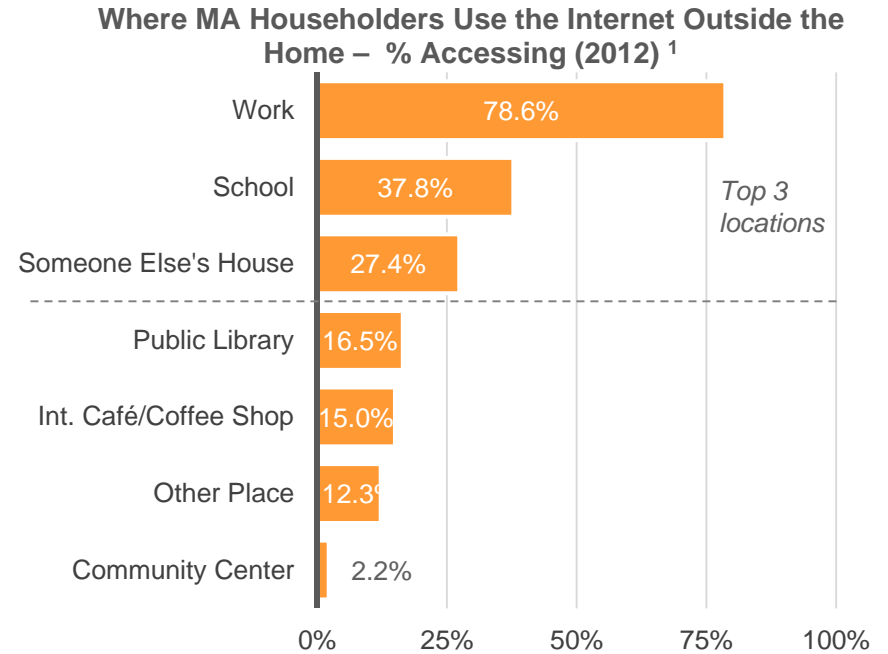
Householder Characteristic	Where Householders Access/Use the Internet ¹				
	In Home Only	Out of Home Only	Both In & Out of Home	Total that Use	Total that Don't Use
Massachusetts	27.0%	4.1%	52.5%	83.5%	16.5%
U.S.	-- not yet published --				
Highest Education Level Attained					
No HS Diploma	21.4%	6.7%	19.5%	47.6%	52.4%
HS Diploma/GED	34.3%	6.2%	32.4%	72.9%	27.1%
Some College/ Associate Degree	25.6%	5.7%	54.7%	86.0%	14.0%
College degree or more	23.8%	1.3%	71.9%	97.1%	2.9%
Age:					
18 – 44 years old	18.1%	6.1%	70.3%	94.6%	5.4%
45 – 64 years old	29.2%	3.1%	56.2%	88.5%	11.5%
65 years old +	36.8%	2.6%	20.1%	59.5%	40.5%

¹ Determined and weighted at the Householder/Household level
 SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012

Where MA Householders Use the Internet Outside the Home



- Work and School are the most common locations for using the internet outside the home:
 - More than three-quarters of Householders use the internet at work
 - More than one-third use it at school
- One of six Householders (16%) use the internet at the Public Library
- Few (2%) use the internet at a Community Center

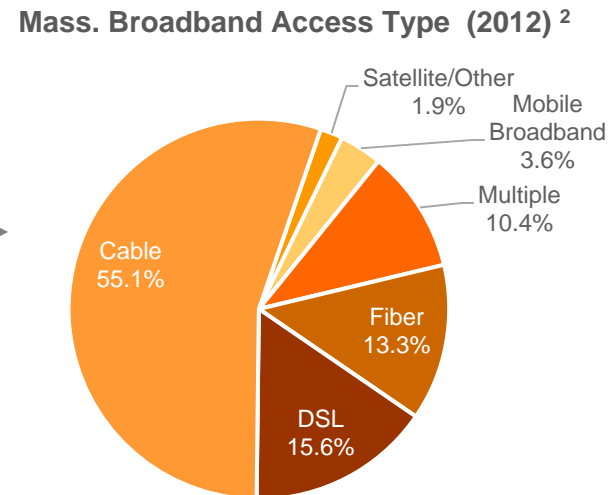
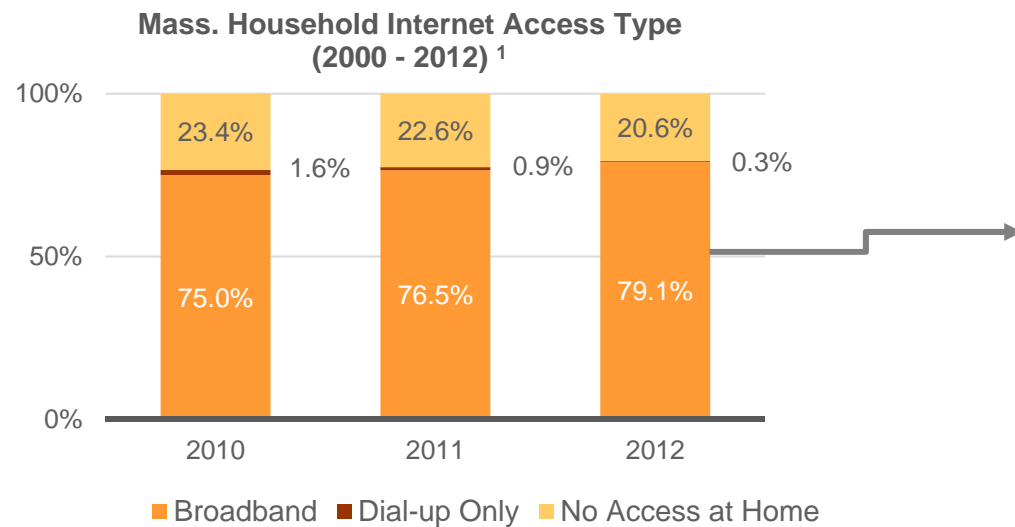


¹ Determined and weighted at the Householder level
SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012

79% of Massachusetts Households Have Broadband in 2012



- 79% of Massachusetts **households** have a broadband connection at home, while **21%** have no home access at all
 - This represents a modest increase of 3.6 percentage points over 2011's adoption rate of 76.5%
 - Of those who do, over half have cable (55%), followed by DSL (16%) and Fiber (13%)
 - 10% of households have more than one form of internet access, often broadband coupled with dial-up
- Only a small fraction - .3% - have only dial-up access



¹ Determined and weighted at the Household level

² Access type distribution for those Households having broadband access

SOURCES: US Census Current Population Survey: Internet and Computer Use Supplement 2012, 2011, and 2010

MA Broadband Adoption Is Highest Among Asian and More Affluent Americans



Ethnicity

- Asian Americans have the highest level of broadband adoption (90%) as well as adoption from all access types (92%)
- Hispanics have the lowest broadband adoption (58%)
- A slightly higher percentage of African Americans (62%) have broadband access at home

Household Annual Income

- The higher the annual income, the greater the broadband adoption
- Broadband adoption exceeds 90% for Households making at least \$50,000
- Broadband adoption for Households making at least \$50,000 annually is nearly double than those making less than \$25,000

Massachusetts 2012 Access Type:

Householder Characteristic	Household Internet Access Type ¹		
	Broadband	Dial-up	No Access
Massachusetts	79.1%	0.3%	20.6%
U.S.	-- not yet published --		
Race and Ethnicity			
White	82.0%	0.1%	17.9%
African American	62.1%	1.2%	36.7%
Hispanic	57.5%	0.0%	42.5%
Asian	90.3%	2.4%	7.3%
American Indian/Alaska Native/Other	-- None in sample --		
Household Annual Income:			
< \$25,000	50.8%	0.5%	48.7%
\$25,000 - \$49,999	70.5%	0.5%	29.0%
\$50,000 - \$74,999	93.9%	0.0%	6.1%
\$75,000 - \$99,999	94.4%	0.0%	5.6%
\$100,000+	98.3%	0.3%	1.4%

¹ Determined and weighted at the Household level

SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012

Education and Age Are Substantial Drivers of MA Broadband Adoption



Education

- Less than 40% of Householders without a High School diploma have adopted broadband
- This adoption rate is less than half the rate of those with some college (80%) and a college degree or higher (96%)

Age

- Broadband adoption declines with age, with the biggest drop-off occurring at ages 65 and older
- Nearly 90% of Householders 18-44 years old have adopted broadband, as compared to 57% of those 65 and older
- 43% of those 65 and older have no access at all

Massachusetts 2012 Access Type:

Householder Characteristic	Household Internet Access Type ¹		
	Broadband	Dial-up	No Access
Massachusetts	79.1%	0.3%	20.6%
U.S.	-- Not yet published- -		
Highest Education Level Attained			
No High School Diploma	39.4%	1.5%	59.1%
High School Diploma/GED	66.1%	0.6%	33.2%
Some College/ Associate Degree	80.4%	0.0%	19.6%
College degree or more	95.7%	0.0%	4.3%
Age:			
18 – 44 years old	88.5%	0.0%	11.5%
45 – 64 years old	84.8%	0.6%	14.5%
65 years old +	56.6%	0.3%	43.1%

¹ Determined and weighted at the Household level

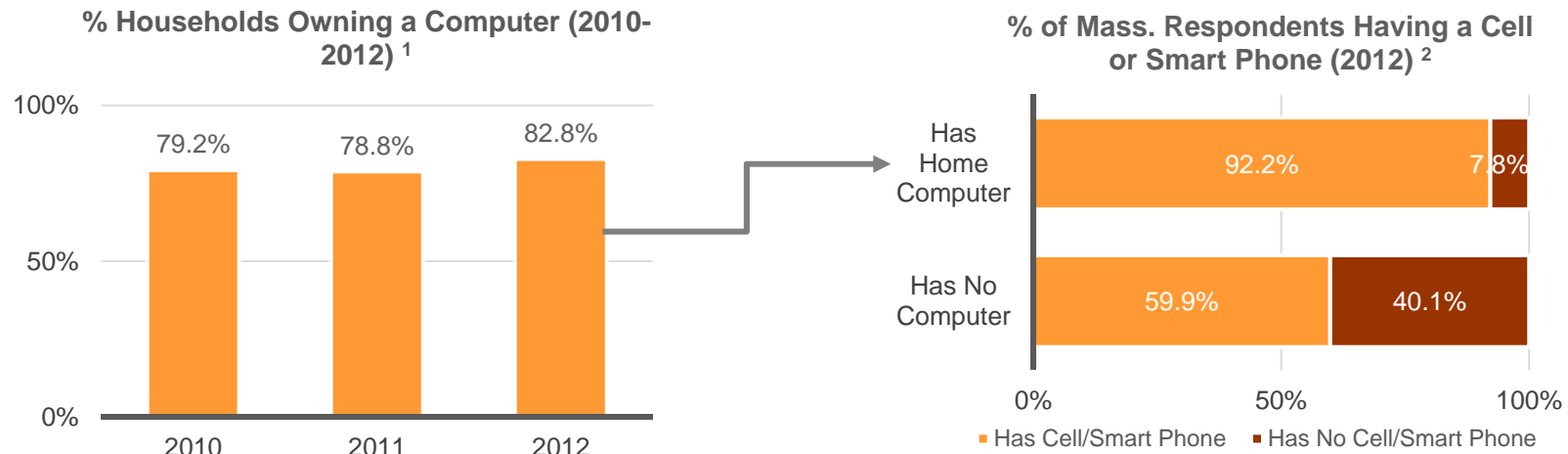
SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012

In 2012, Over 80% of Massachusetts Households Have a Home Computer



- In 2012, 83% of Massachusetts households have a computer at home ¹
- This represents a modest increase of 4.0 percentage points over 2011's computer ownership
- Of Massachusetts respondents having a computer at home, 92% also have a cell or smart phone ²
- Of Massachusetts respondents not having a computer at home, 60% also have a cell or smart phone ²
- Approximately 7% of respondents have neither a computer at home nor a cell or smart phone ²

Note: while the CPS determines computer ownership at the Household/Householder level, it determines cell/smart phone ownership at the Primary Respondent level. (See 'Terms' slide for definitions).



¹ Based on weightings of households in sample

² Based on weightings of individual primary respondents for households in sample

SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2010, 2011, and 2012

Massachusetts Race and Income Influence Computer and Cell/Smart Phone Ownership . . .



Race

- Asian Americans have the highest rate of computer and cell/smart phone ownership at 96% and 94%, respectively
- Hispanics have the lowest rates of computer ownership (62%) while African Americans have the lowest rates of cell/smart phone ownership (81%)
- Computer and cell/smart phone ownership increase as household income increases

Household Income:

- Computer and cell/smart phone ownership increases dramatically with income
- There is nearly a 40 percentage point differential between computer ownership for those earning less than \$25,000 and those earning at least \$100,000
- For cell/smart phone ownership, this differential is 30 percentage points

Massachusetts 2012 Device Ownership:

Household/Primary Respondent Characteristic	Home Computer Ownership ¹	Cell/Smart Phone Ownership ²
Massachusetts	82.8%	86.1%
U.S.	78.9%	-- not yet published --
Race and Ethnicity		
White	85.6%	85.4%
African American	64.9%	81.1%
Hispanic	62.0%	90.1%
Asian	95.6%	93.9%
American Indian/Alaska Native/Other	-- None in sample --	
Household Annual Income:		
< \$25,000	61.2%	67.5%
\$25,000 - \$49,999	72.8%	83.2%
\$50,000 - \$74,999	94.4%	95.1%
\$75,000 - \$99,999	95.9%	95.6%
\$100,000+	99.5%	97.8%

Note: while the CPS determines computer ownership at the Household/Householder level, it determines cell/smart phone ownership at the Primary Respondent level. (See 'Terms' slide for definitions).

¹ Based on weightings of Households/Householders in sample

² Based on weightings of individual Primary Respondents for households in sample

SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012



... As Do Education, Metro Status, and Age

Education

- Of all the demographic attributes, Education Attainment has the greatest impact on computer and cell usage
- Those with a college degree are almost twice as likely to own a home computer and 50% as likely to own a cell phone

Age

- Computer and cell phone ownership declines approximately 25% for those older than 65, most likely reflecting generational comfort with, need for, and usage of technology

Massachusetts 2012 Device Ownership:

Householder/Primary Respondent Characteristic	Home Computer Ownership ¹	Cell/Smart Phone Ownership ²
Massachusetts	82.8%	86.1%
U.S.	78.9%	-- not yet published --
Highest Education Level Achieved:		
No High School Diploma	50.9%	64.8%
High School Diploma/GED	74.2%	74.5%
Some College/Associate Degree	78.5%	89.7%
College degree or more	97.6%	95.8%
Age		
18 – 44 years old	88.8%	94.6%
45 – 64 years old	87.7%	89.1%
65 years old +	66.7%	67.5%

Note: while the CPS determines computer ownership at the Household/Householder level, it determines cellphone ownership at the Primary Respondent level. (See 'Terms' slide for definitions).

¹ Based on weightings of Households/Householders in sample

² Based on weightings of individual Primary Respondents for households in sample

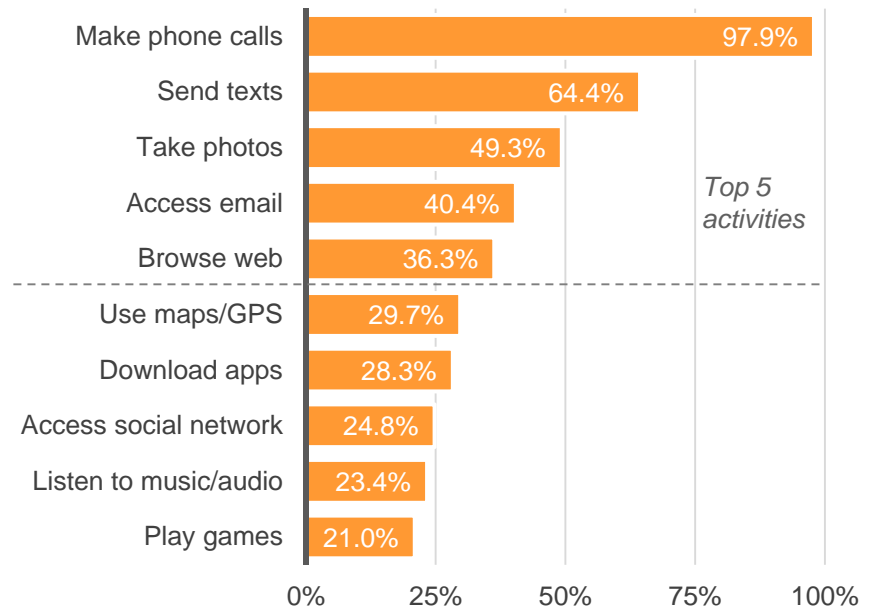
SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012

What MA Individuals Use Cell or Smart Phones For



- Expectedly, individual Primary Respondents use their cell or smart phones mostly for making phone calls and sending texts
- At least a third of Primary Respondents also use their phone for taking photos, accessing email, and browsing the web
- Fewer Respondents – approximately 20-30% - use their phone for such activities as social networking, listening to music and playing games

What MA Respondents Use Cell or Smart phone For – % Performing Activity (2012) ¹



¹ Based on weightings of individual Primary Respondents
SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012

U.S. Rural and Urban Internet Usage and Broadband Adoption



As indicated previously, there is insufficient data in the CPS Internet Supplement to determine rural internet and broadband adoption in Massachusetts in 2011 or 2012. As a result, for reference purposes only, we present here the related U.S. adoption statistics for 2011.

Note that we do not have data to determine to what degree Massachusetts' rural and urban adoption compares to the U.S.

- Computer ownership, internet use, and broadband adoption among U.S. rural households substantially lags that of urban households
- In U.S. rural households, computer ownership is 10 percentage points lower than urban households
- With respect to internet use and broadband adoption, the U.S. rural household rate is 12 and 14 percentage points lower, respectively, than urban households
- It is likely that lower adoption is due to multiple factors, including broadband availability and lower education and income levels

U.S. Adoption by Metropolitan Status ¹ - 2011

Metropolitan Status	Computer Ownership	Internet Use	Broadband Adoption
Rural	67%	62%	58%
Urban	77%	74%	72%
Percentage Point Difference	10%	12%	14%

¹ Determined and weighted at the Household level

SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2011



2011 Broadband Adoption and Demographics

Gateway Cities



Sample and Methodology

The Census Bureau's Internet and Computer Use Supplements for 2010, 2011, and 2012 do not contain a sufficient number of households on which to calculate statistics on survey results for Massachusetts's Gateway Cities. (Note: there are only 835 households in the 2012 Supplement for all of Massachusetts). **As a result, we took an alternative approach – outlined below and on the next page – that allowed us to roughly estimate broadband adoption in 2011 for the general geographic areas associated with the Gateway Cities and for Boston and Cambridge:**

- We used as our sample the Census' **ACS 3-year 2009-2011 survey**, which includes 78,403 Massachusetts Households (excluding those representing Group Quarters).
 - We used this data set, given its sample size (much larger than the 1 year CPS data), its completeness (possessed geographic coding for all records vs. only 1/3rd of records in the ACS 2010-2012 data set), and timeliness (was reasonably close to our 2012 reporting period)
- We applied the NTIA broadband adoption regression formula (see Appendix) to each of these Households to estimate the probability that the Household subscribes to **broadband in 2011**:
 - This formula is based on the Internet and Computer Use Supplement for 2010 since the NTIA has not published the one for 2011 or 2012. Per the NTIA, there is no meaningful difference between the 2010 and 2011 regressions, so we assume the 2010 one will yield similar results to 2011.
 - Given that the NTIA regression formula has an r-squared of .2765, the broadband calculations are not intended to be precise but rather to provide a high-level and comparative view.

NOTE: *Based on this approach, we calculate a **broadband adoption rate for Massachusetts households of 75.9%**, which is 0.6 percentage points lower than the 76.5% rate determined by the 2011 Internet and Computer Use Survey. Per the NTIA, this discrepancy is reasonable, given the error levels inherent in each approach. The PUMA 75.9% adoption rate is for 2011 while the adoption rate for MA as noted earlier in this report is for 2012 and, thus, is higher.*



Sample and Methodology continued

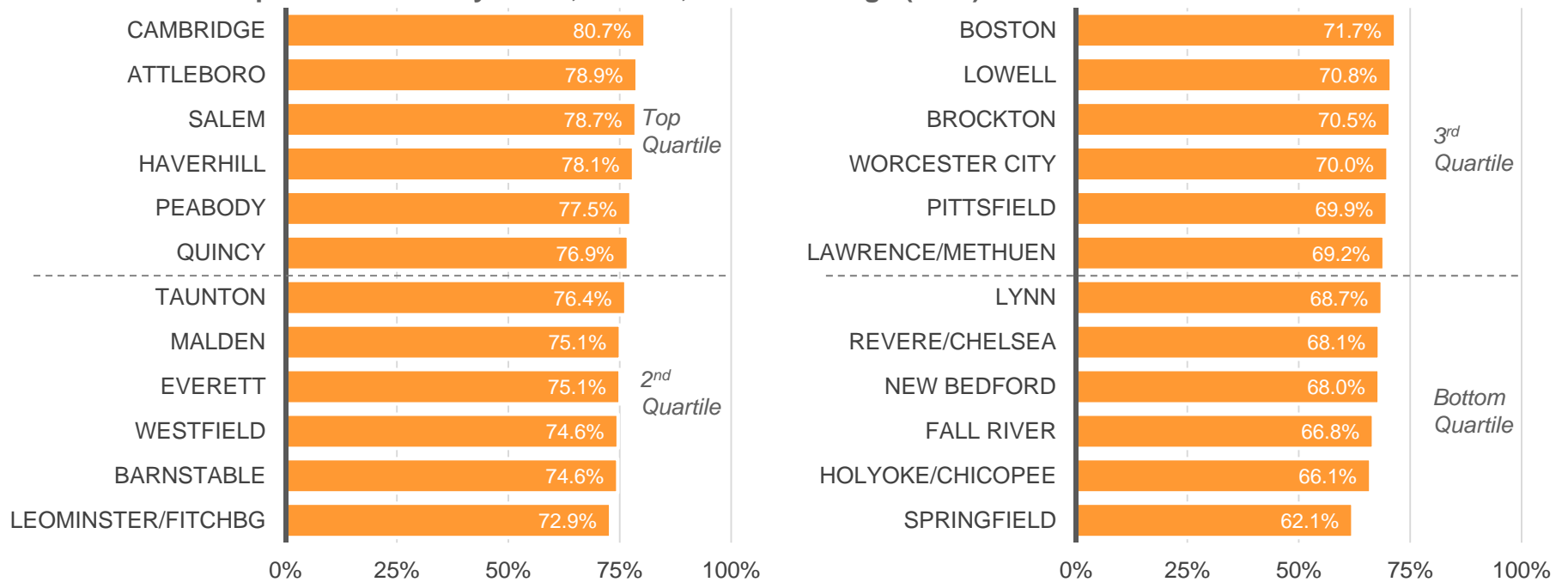
- Using this estimated adoption rate and the Census' weighting for each Household, we determined the estimated adoption rate for **Public Use Microdata Areas (PUMAs)** associated with Boston, Cambridge and the Massachusetts Gateway Cities:
 - Each Household record has a code that indicates which PUMA it is located in
 - PUMAs are geographic areas consisting of **more than 100,000 individuals**. For less-populated areas, the Census has consolidated areas with similar demographics into a given PUMA until it exceeds the 100,000 individual threshold
 - Since Gateway Cities have fewer than 100,000 individuals, they are combined by the Census with surrounding areas or other Gateway Cities into a given PUMA; As a result, certain Gateway Cities fall within the same PUMA, including Leominster and Fitchburg (PUMA code 300), Lawrence and Methuen (PUMA code 700), Holyoke and Chicopee (PUMA code 1700), and Revere and Chelsea (PUMA code 2900)
 - The ACS 3-year 2009-2011 survey data includes PUMA definitions (PUMA00) used by the **Census Bureau from 2000 to 2009**
 - There are a total of **52 PUMAs within Massachusetts**, of which 28 apply to Boston (5 PUMA codes), Cambridge (1 PUMA code), and the 26 Gateway Cities (22 PUMA codes)
- To provide context to broadband adoption for a PUMA, we have calculated and presented a profile of **key demographic broadband drivers** of the Households in that area

2011 Broadband Adoption | Gateway Cities



- Gateway Cities are approximated by the related Census PUMA codes (see Methodology)
- Broadband adoption ranges are estimated from 62.1% (Springfield) to 78.9% (Attleboro). (Cambridge – which is not a Gateway City – had the highest adoption at 80.7%)
- Broadband adoption is driven by the demographic profile of each city, including – per the NTIA regression analysis – such key attributes as Race, Household Income, Education Level, and Age (see succeeding slides)

Broadband Adoption for Gateway Cities, Boston, and Cambridge (2011):



¹ Based on weightings of individual Primary Respondents
 SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012



Gateway City Observations

- Driving Springfield's low estimated broadband adoption rate (62.1%) are the highest portion of minorities, low earnings, and low educational attainment among all other cities
- Other cities in the bottom half of the adoption range (adoption less than 72%) also share high proportions of minorities, low earnings, and low educational attainment; the exceptions are Fall River and Pittsfield, which both have a relatively low minority, but older, population
- At the other end of the spectrum, Cambridge has the highest estimated adoption rate (80.7%) driven largely by a highly educated and younger population
- Other cities in the top half of adoption (greater than 72%) generally have a combination of lower minority, higher income, and higher educated populations
- Barnstable and Peabody (74.6% and 77.5% adoption rates) have the oldest populations, but this negative driver of adoption is offset by a lower minority presence, higher incomes, and higher education than the average
- Cities appearing to share similar demographics and adoption rates (in parentheses) are as follows:
 - Everett (75.1%), Malden (75.1%)
 - Barnstable (74.6%), Peabody (77.5%)
 - Westfield (74.6%), Taunton (76.4%), Attleboro (78.9%)
 - Quincy (76.9%), Haverhill (78.1%)
 - Lawrence/Methuen (69.2%), Brockton (70.5%), Boston (71.7%)
 - Holyoke/Chicopee (66.1%), Revere/Chelsea (68.1%), Lynn (68.7%), Worcester (70.0%)
 - Fall River (66.8%), New Bedford (68.0%), Pittsfield (69.9%)
 - Lowell (70.8%), Leominster/Fitchburg (72.9%)

2011 Gateway City Demographics - Race and Ethnicity – Page 1 of 2



			Householder Race and Ethnicity Profile ¹				
Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	White	African American	Hispanic	Asian American	Am Indian/ Alaska Ntv
-- All Massachusetts ²	--	75.9%	81.7%	5.7%	7.5%	4.5%	0.1%
1900 Springfield	Springfield	62.1%	44.8%	18.8%	34.2%	1.6%	0.6%
1700 Hampden County*/Chicopee/ Holyoke/Easthampton	Holyoke/Chicopee	66.1%	75.0%	2.3%	21.0%	1.6%	0.2%
4400 Bristol County*/Fall River/Somerset	Fall River	66.8%	91.0%	2.2%	4.7%	1.3%	0.7%
4500 Bristol County*/New Bedford/ Dartmouth/Fairhaven	New Bedford	68.0%	85.5%	4.6%	6.7%	1.1%	2.1%
2900 Suffolk County*/Revere/ Chelsea/Winthrop	Revere/Chelsea	68.1%	65.0%	4.0%	26.7%	3.9%	0.4%
1200 Essex County*/Lynn/Saugus	Lynn	68.7%	68.8%	8.1%	18.3%	4.0%	0.7%
700 Essex County*/Lawrence/ Methuen/Andover	Lawrence/Methuen	69.2%	56.1%	1.9%	37.4%	4.3%	0.3%
100 Berkshire County*/Pittsfield/ North Adams	Pittsfield	69.9%	94.1%	2.2%	2.4%	0.9%	0.5%
2300 Worcester City	Worcester	70.0%	68.2%	9.8%	16.4%	5.2%	0.4%
4000 Plymouth County*/ Brockton/Abington	Brockton	70.5%	60.2%	27.9%	7.4%	2.0%	2.5%
600 Lowell/Middlesex County*	Lowell	70.8%	65.9%	6.8%	12.9%	13.0%	1.4%
3301- 3305 Boston/Suffolk County	Boston	71.7%	55.7%	21.1%	13.4%	8.5%	1.3%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Gateway City Demographics - Race and Ethnicity – Page 2 of 2



			Householder Race and Ethnicity Profile ¹					
Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	White	African American	Hispanic	Asian American	Am Indian/ Alaska Ntv	
--	All Massachusetts ²	75.9%	81.7%	5.7%	7.5%	4.5%	0.1%	
300	Worcester County*/Leominster/ Fitchburg/Gardner	Leominster/ Fitchburg	72.9%	86.7%	2.1%	8.9%	1.4%	0.8%
4800	Barnstable/Yarmouth/ Sandwich/ Dennis/Mashpee/Harwich	Barnstable	74.6%	95.2%	1.6%	1.6%	0.6%	1.0%
1800	Hampden County*/Westfield/ Agawam/ West Springfield	Westfield	74.6%	91.3%	1.9%	3.9%	2.2%	0.7%
3100	Middlesex County*/Somerville/ Everett	Everett	75.1%	77.1%	7.3%	9.0%	5.5%	1.0%
3000	Middlesex County*/ Malden/Medford	Malden	75.1%	70.7%	10.2%	5.2%	13.0%	0.8%
4200	Bristol County*/Taunton/ Mansfield/Norton	Taunton	76.4%	90.4%	3.2%	4.0%	1.5%	1.0%
3800	Norfolk County*/Quincy/Milton	Quincy	76.9%	75.4%	6.3%	3.3%	14.7%	0.4%
1000	Essex County*/Peabody/ Danvers/Lynnfield	Peabody	77.5%	93.8%	1.1%	3.5%	1.4%	0.2%
800	Essex County*/Haverhill/North Andover	Haverhill	78.1%	88.7%	1.3%	7.5%	1.9%	0.6%
1100	Essex County*/Salem/Beverly/ Marblehead/Swampscott	Salem	78.7%	91.2%	2.1%	5.5%	1.2%	0.1%
4300	Bristol County*/Attleboro/North Attleborough/Swansea/Seekonk	Attleboro	78.9%	92.2%	1.6%	2.9%	3.1%	0.1%
3200	Cambridge	Cambridge	80.7%	71.7%	9.8%	6.7%	11.6%	0.1%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Gateway City Demographics - Household Income – Page 1 of 2



			Household Income ¹				
Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	< \$25,000	\$25,000 - \$49,999	\$50,000 - \$74,999	\$75,000 - \$99,999	\$100,000+
-- All Massachusetts ²	--	75.9%	21.3%	19.6%	16.9%	12.8%	29.4%
1900 Springfield	Springfield	62.1%	38.9%	25.0%	16.9%	9.9%	9.3%
1700 Hampden County*/Chicopee/ Holyoke/Easthampton	Holyoke/Chicopee	66.1%	33.5%	26.0%	18.6%	10.2%	11.7%
4400 Bristol County*/Fall River/Somerset	Fall River	66.8%	34.1%	21.9%	16.4%	12.1%	15.5%
4500 Bristol County*/New Bedford/ Dartmouth/Fairhaven	New Bedford	68.0%	30.4%	20.6%	17.4%	12.6%	19.0%
2900 Suffolk County*/Revere/ Chelsea/Winthrop	Revere/ Chelsea	68.1%	27.6%	24.2%	18.7%	12.8%	16.6%
1200 Essex County*/Lynn/Saugus	Lynn	68.7%	27.8%	24.8%	17.5%	10.4%	19.5%
700 Essex County*/Lawrence/ Methuen/Andover	Lawrence/Methuen	69.2%	29.1%	21.8%	15.1%	10.7%	23.2%
100 Berkshire County*/Pittsfield/ North Adams	Pittsfield	69.9%	30.3%	26.7%	17.7%	11.2%	14.1%
2300 Worcester City	Worcester	70.0%	31.6%	24.2%	18.0%	10.5%	15.7%
4000 Plymouth County*/ Brockton/Abington	Brockton	70.5%	25.2%	23.5%	19.9%	12.8%	18.5%
600 Lowell/Middlesex County*	Lowell	70.8%	27.1%	24.9%	21.1%	12.6%	14.3%
3301- 3305 Boston/Suffolk County	Boston	71.7%	30.5%	18.9%	15.7%	11.0%	23.9%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Gateway City Demographics - Household Income – Page 2 of 2



			Household Income ¹				
Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	< \$25,000	\$25,000 - \$49,999	\$50,000 - \$74,999	\$75,000 - \$99,999	\$100,000+
--	All Massachusetts ²	75.9%	21.3%	19.6%	16.9%	12.8%	29.4%
300	Worcester County*/Leominster/Fitchburg/Gardner	72.9%	23.4%	24.9%	18.0%	13.7%	20.0%
4800	Barnstable/Yarmouth/ Sandwich/Dennis/Mashpee/Harwich	74.6%	19.3%	24.8%	19.0%	15.0%	21.8%
1800	Hampden County*/Westfield/Agamwam/ West Springfield	74.6%	22.5%	21.0%	18.6%	15.3%	22.6%
3100	Middlesex County*/Somerville/Everett	75.1%	24.3%	20.7%	17.4%	15.2%	22.4%
3000	Middlesex County*/Malden/Medford	75.1%	22.3%	21.4%	18.1%	12.7%	25.5%
4200	Bristol County*/Taunton/Mansfield/Norton	76.4%	19.6%	22.0%	17.1%	14.4%	27.0%
3800	Norfolk County*/Quincy/Milton	76.9%	19.5%	19.8%	17.6%	12.7%	30.4%
1000	Essex County*/Peabody/Danvers/Lynnfield	77.5%	14.9%	18.7%	17.1%	13.8%	35.5%
800	Essex County*/Haverhill/North Andover	78.1%	17.5%	19.0%	16.1%	12.7%	34.7%
1100	Essex County*/Salem/Beverly/Marblehead/Swampscott	78.7%	18.1%	18.6%	17.9%	12.1%	33.3%
4300	Bristol County*/Attleboro/North Attleborough/Swansea/Seekonk	78.9%	15.6%	20.7%	20.4%	12.3%	31.0%
3200	Cambridge	80.7%	22.6%	17.4%	15.7%	11.4%	32.9%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Gateway City Demographics - Educational Attainment – Page 1 of 2



Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	Householder Highest Education Level Attained ¹			
			No High School Diploma	High School Diploma	Some College/ Assoc. Degree	Bachelors Degree+
-- All Massachusetts ²	--	75.9%	10.0%	23.9%	25.6%	40.5%
1900 Springfield	Springfield	62.1%	24.4%	30.2%	27.7%	17.7%
1700 Hampden County*/Chicopee/ Holyoke/Easthampton	Holyoke/Chicopee	66.1%	20.2%	29.3%	31.6%	18.9%
4400 Bristol County*/Fall River/Somerset	Fall River	66.8%	26.1%	27.7%	27.3%	19.0%
4500 Bristol County*/New Bedford/ Dartmouth/Fairhaven	New Bedford	68.0%	22.2%	29.0%	24.9%	23.9%
2900 Suffolk County*/Revere/ Chelsea/Winthrop	Revere/ Chelsea	68.1%	19.2%	34.0%	24.5%	22.3%
1200 Essex County*/Lynn/Saugus	Lynn	68.7%	16.3%	35.6%	27.0%	21.2%
700 Essex County*/Lawrence/ Methuen/Andover	Lawrence/Methuen	69.2%	18.1%	26.1%	26.0%	29.8%
100 Berkshire County*/Pittsfield/ North Adams	Pittsfield	69.9%	9.9%	31.2%	28.8%	30.1%
2300 Worcester City	Worcester	70.0%	14.6%	25.4%	27.8%	32.2%
4000 Plymouth County*/ Brockton/Abington	Brockton	70.5%	14.2%	29.5%	34.2%	22.1%
600 Lowell/Middlesex County*	Lowell	70.8%	17.4%	31.3%	27.2%	24.0%
3301- 3305 Boston/Suffolk County	Boston	71.7%	13.6%	20.4%	20.9%	45.1%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Gateway City Demographics - Educational Attainment – Page 2 of 2



			Householder Highest Education Level Attained ¹				
Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	No High School Diploma	High School Diploma	Some College/ Assoc. Degree	Bachelors Degree+	
--	All Massachusetts ²	--	75.9%	10.0%	23.9%	25.6%	40.5%
300	Worcester County*/Leominster/ Fitchburg/Gardner	Leominster/ Fitchburg	72.9%	12.5%	30.0%	34.2%	23.2%
4800	Barnstable/Yarmouth/ Sandwich/ Dennis/Mashpee/Harwich	Barnstable	74.6%	5.2%	24.1%	31.1%	39.6%
1800	Hampden County*/Westfield/ Agawam/ West Springfield	Westfield	74.6%	8.4%	31.2%	31.9%	28.5%
3100	Middlesex County*/Somerville/ Everett	Everett	75.1%	12.8%	26.0%	20.2%	41.0%
3000	Middlesex County*/ Malden/Medford	Malden	75.1%	11.8%	23.9%	25.8%	38.5%
4200	Bristol County*/Taunton/ Mansfield/Norton	Taunton	76.4%	11.0%	29.7%	31.6%	27.7%
3800	Norfolk County*/Quincy/Milton	Quincy	76.9%	9.3%	20.5%	25.7%	44.4%
1000	Essex County*/Peabody/ Danvers/Lynnfield	Peabody	77.5%	7.0%	23.6%	27.6%	41.8%
800	Essex County*/Haverhill/North Andover	Haverhill	78.1%	8.4%	24.0%	27.1%	40.6%
1100	Essex County*/Salem/Beverly/ Marblehead/Swampscott	Salem	78.7%	6.7%	18.0%	27.1%	48.3%
4300	Bristol County*/Attleboro/North Attleborough/Swansea/Seekonk	Attleboro	78.9%	8.1%	27.6%	30.0%	34.4%
3200	Cambridge	Cambridge	80.7%	4.2%	10.6%	11.9%	73.2%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Gateway City Demographics - Age – Page 1 of 2



Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	Householder Age (years) ¹				
			18-24	25-44	45-64	65-84	85+
-- All Massachusetts ²	--	75.9%	3.3%	33.1%	41.2%	18.9%	3.5%
1900 Springfield	Springfield	62.1%	4.7%	35.7%	39.1%	17.7%	2.8%
1700 Hampden County*/Chicopee/ Holyoke/Easthampton	Holyoke/Chicopee	66.1%	4.0%	34.0%	38.8%	19.2%	4.0%
4400 Bristol County*/Fall River/Somerset	Fall River	66.8%	4.0%	34.9%	37.1%	20.5%	3.5%
4500 Bristol County*/New Bedford/ Dartmouth/Fairhaven	New Bedford	68.0%	2.6%	30.7%	41.1%	20.9%	4.7%
2900 Suffolk County*/Revere/ Chelsea/Winthrop	Revere/ Chelsea	68.1%	2.6%	39.1%	37.7%	17.9%	2.6%
1200 Essex County*/Lynn/Saugus	Lynn	68.7%	2.5%	32.4%	42.1%	19.8%	3.2%
700 Essex County*/Lawrence/ Methuen/Andover	Lawrence/Methuen	69.2%	3.9%	34.5%	42.8%	15.3%	3.5%
100 Berkshire County*/Pittsfield/ North Adams	Pittsfield	69.9%	3.1%	25.4%	42.6%	24.1%	4.7%
2300 Worcester City	Worcester	70.0%	5.0%	38.5%	36.7%	15.9%	3.9%
4000 Plymouth County*/ Brockton/Abington	Brockton	70.5%	2.8%	34.0%	43.3%	17.2%	2.7%
600 Lowell/Middlesex County*	Lowell	70.8%	5.4%	40.0%	37.8%	14.7%	2.1%
3301- 3305 Boston/Suffolk County	Boston	71.7%	9.7%	41.7%	31.4%	14.6%	2.5%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

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2011 Gateway City Demographics - Age – Page 2 of 2



			Householder Age (years) ¹					
Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	18-24	25-44	45-64	65-84	85+	
--	All Massachusetts ²	--	75.9%	3.3%	33.1%	41.2%	18.9%	3.5%
300	Worcester County*/Leominster/ Fitchburg/Gardner	Leominster/ Fitchburg	72.9%	2.8%	32.5%	43.2%	17.7%	3.7%
4800	Barnstable/Yarmouth/ Sandwich/ Dennis/Mashpee/Harwich	Barnstable	74.6%	1.8%	22.0%	41.3%	29.3%	5.6%
1800	Hampden County*/Westfield/ Agawam/ West Springfield	Westfield	74.6%	1.8%	31.1%	44.1%	19.4%	3.7%
3100	Middlesex County*/Somerville/ Everett	Everett	75.1%	7.2%	47.1%	29.2%	14.3%	2.3%
3000	Middlesex County*/ Malden/Medford	Malden	75.1%	3.7%	39.2%	36.1%	18.1%	3.0%
4200	Bristol County*/Taunton/ Mansfield/Norton	Taunton	76.4%	1.6%	35.2%	44.1%	15.8%	3.3%
3800	Norfolk County*/Quincy/Milton	Quincy	76.9%	2.9%	36.0%	38.0%	18.7%	4.3%
1000	Essex County*/Peabody/ Danvers/Lynnfield	Peabody	77.5%	1.4%	28.9%	40.8%	22.8%	6.2%
800	Essex County*/Haverhill/North Andover	Haverhill	78.1%	1.5%	31.0%	47.0%	16.7%	3.8%
1100	Essex County*/Salem/Beverly/ Marblehead/Swampscott	Salem	78.7%	2.9%	30.5%	44.1%	18.8%	3.8%
4300	Bristol County*/Attleboro/North Attleborough/Swansea/Seekonk	Attleboro	78.9%	2.4%	32.2%	45.2%	17.1%	3.2%
3200	Cambridge	Cambridge	80.7%	6.4%	49.0%	29.1%	13.0%	2.5%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Gateway City Demographics - Summary By Risk Factor – Page 1 of 2



			% of Householders With Highest Broadband Risk Factors ¹			
Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	Afr American or Hispanic	Income < \$25,000	High School Degree or Less	Aged 65+
-- All Massachusetts ²	--	75.9%	13.8%	21.3%	33.9%	22.4%
1900 Springfield	Springfield	62.1%	53.6%	38.9%	54.6%	20.5%
1700 Hampden County*/Chicopee/Holyoke/Easthampton	Holyoke/Chicopee	66.1%	23.5%	33.5%	49.5%	23.2%
4400 Bristol County*/Fall River/Somerset	Fall River	66.8%	7.7%	34.1%	53.7%	24.0%
4500 Bristol County*/New Bedford/Dartmouth/Fairhaven	New Bedford	68.0%	13.4%	30.4%	51.2%	25.6%
2900 Suffolk County*/Revere/Chelsea/Winthrop	Revere/ Chelsea	68.1%	31.1%	27.6%	53.2%	20.6%
1200 Essex County*/Lynn/Saugus	Lynn	68.7%	27.2%	27.8%	51.8%	23.0%
700 Essex County*/Lawrence/Methuen/Andover	Lawrence/Methuen	69.2%	39.6%	29.1%	44.2%	18.9%
100 Berkshire County*/Pittsfield/North Adams	Pittsfield	69.9%	5.0%	30.3%	41.1%	28.8%
2300 Worcester City	Worcester	70.0%	26.6%	31.6%	40.0%	19.8%
4000 Plymouth County*/Brockton/Abington	Brockton	70.5%	37.8%	25.2%	43.7%	19.9%
600 Lowell/Middlesex County*	Lowell	70.8%	21.0%	27.1%	48.7%	16.8%
3301-3305 Boston/Suffolk County	Boston	71.7%	35.8%	30.5%	34.0%	17.1%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Gateway City Demographics - Summary By Risk Factor – Page 2 of 2



			% of Householders With Highest Broadband Risk Factors ¹			
Census PUMA Code/Area	Related Gateway City	Broadband Adoption ¹	Afr American or Hispanic	Income < \$25,000	High School Degree or Less	Aged 65+
-- All Massachusetts ²	--	75.9%	13.8%	21.3%	33.9%	22.4%
300 Worcester County*/Leominster/Fitchburg/Gardner	Leominster/Fitchburg	72.9%	11.8%	23.4%	42.6%	21.4%
4800 Barnstable/Yarmouth/ Sandwich/Dennis/Mashpee/Harwich	Barnstable	74.6%	4.2%	19.3%	29.3%	34.9%
1800 Hampden County*/Westfield/Agamwam/ West Springfield	Westfield	74.6%	6.4%	22.5%	39.6%	23.1%
3100 Middlesex County*/Somerville/Everett	Everett	75.1%	17.4%	24.3%	38.8%	16.6%
3000 Middlesex County*/Malden/Medford	Malden	75.1%	16.3%	22.3%	35.7%	21.0%
4200 Bristol County*/Taunton/Mansfield/Norton	Taunton	76.4%	8.1%	19.6%	40.7%	19.1%
3800 Norfolk County*/Quincy/Milton	Quincy	76.9%	10.0%	19.5%	29.8%	23.1%
1000 Essex County*/Peabody/Danvers/Lynnfield	Peabody	77.5%	4.8%	14.9%	30.6%	29.0%
800 Essex County*/Haverhill/North Andover	Haverhill	78.1%	9.4%	17.5%	32.3%	20.5%
1100 Essex County*/Salem/Beverly/Marblehead/Swampscott	Salem	78.7%	7.7%	18.1%	24.7%	22.5%
4300 Bristol County*/Attleboro/North Attleborough/Swansea/Seekonk	Attleboro	78.9%	4.7%	15.6%	35.6%	20.3%
3200 Cambridge	Cambridge	80.7%	16.7%	22.6%	14.9%	15.5%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement



2011 Broadband Adoption and Demographics

Other Massachusetts Towns and Cities

Sample and Methodology



To estimate broadband adoption rates in towns and cities other than the Gateway Cities, Boston, and Cambridge, we used the same sample and methodology as we did for those areas.

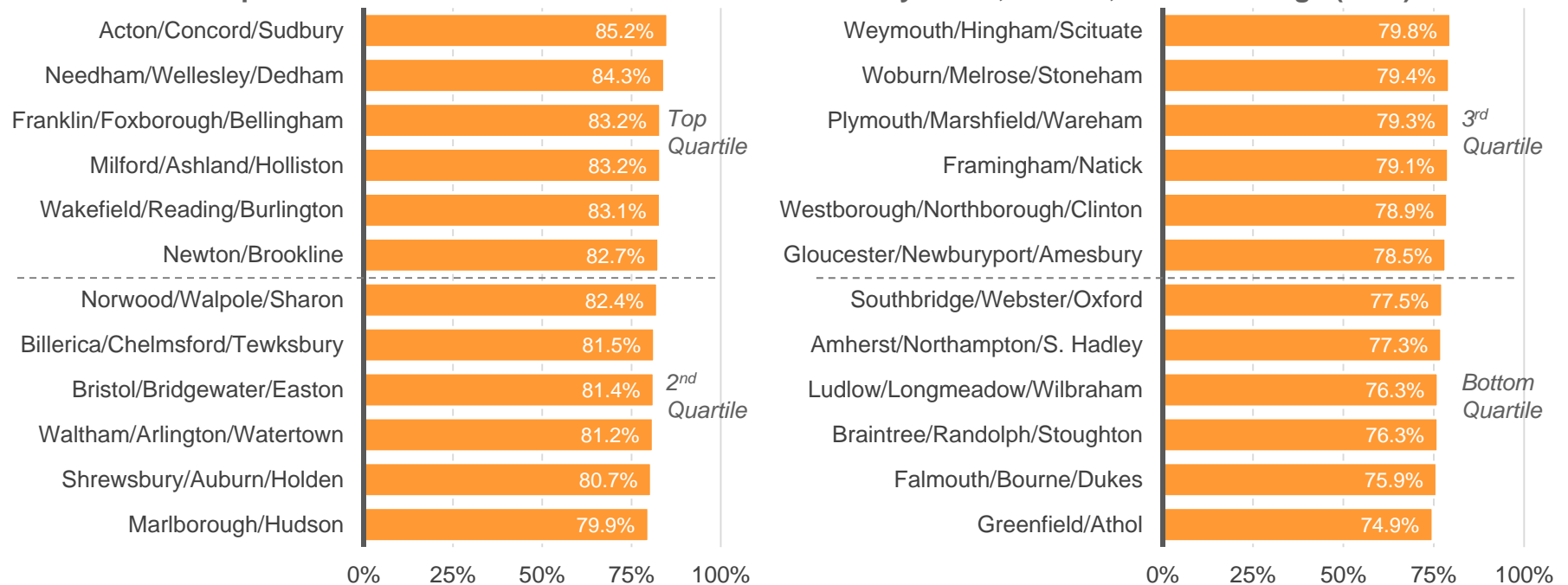
Please refer to the description of the sample and methodology at the beginning of the 'Gateway Cities' section of this presentation.

2011 Broadband Adoption | Other Massachusetts Towns/Cities



- Non-Gateway Cities are approximated by the related 24 Census PUMA codes (see Methodology)
- Broadband adoption ranges are estimated from 74.9% (Greenfield/Athol) to 85.2% (Acton/Concord/Sudbury), which is the highest area adoption rate in all of Massachusetts
- Broadband adoption is driven by the demographic profile of each city, including – per the NTIA regression analysis – such key attributes as Race, Household Income, Education Level, and Age (see succeeding slides)

Broadband Adoption for Towns and Cities Other Than the Gateway Cities, Boston, and Cambridge (2011):



¹ Based on weightings of individual Primary Respondents
SOURCE: US Census Current Population Survey: Internet and Computer Use Supplement 2012



Other Town/City Observations

- The 24 Other Towns/Cities largely have a higher estimated adoption rate than the Gateway Cities, Boston, and Cambridge, with all but one PUMA – PUMA Code 200 for Greenfield/Athol (adoption rate of 74.9%) – having a rate lower than the Massachusetts average of 75.9%
- Driving Greenfield/Athol's low estimated adoption rate (74.9%) primarily are low levels of educational attainment and low incomes
- Acton/Concord/Sudbury had the highest estimated adoption rate (85.2%), primarily due to high education and income levels and a low minority population
- Only two towns/cities exceeded the average Massachusetts minority population rates (13.8%) – Braintree/Randolph/Stoughton (17.1%) and Framingham/Natick (14.7%)
- Greenfield/Athol and Amherst/Northampton/South Hadley had the lowest income populations, with 21.8% and 23.4% making less than \$25,000 and contributing to their lower estimated adoption rates of 74.9% and 77.3%
- Four towns/cities had proportions of their populations with a High School degree or less that were higher than the Massachusetts average of 33.9% – Greenfield/Athol (38.2%), Braintree/Randolph/Stoughton (35.4%), Ludlow/Longmeadow/Wilbraham (35.1%) and Southbridge/Webster/Oxford (41.3%)
- Falmouth/Bourne/Stoughton had the oldest population, with 34.7% aged 65 and older



Other Town/City Observations continued

- Towns/Cities appearing to share similar demographics and adoption rates (in parentheses) are as follows:
 - Greenfield/Athol (74.9%), Southbridge/Webster/Oxford (77.5%),
 - Falmouth/Bourne/Dukes (75.9%), Amherst/Northampton/South Hadley (77.3%)
 - Braintree/Randolph/Stoughton (76.3%), Framingham/Natick (79.1%)
 - Ludlow/Longmeadow/Wilbraham (76.3%), Gloucester/Newburyport/Amesbury (78.5%), Westborough/Northborough/Clinton (78.9%), Plymouth/Marshfield/Wareham (79.3%), Woburn/Melrose/Stoneham (79.4%), Weymouth/Hingham/Scituate (79.8%),
 - Marlborough/Hudson (79.9%), Shrewsbury/Auburn/Holden (80.7%), Bristol/Bridgewater/Easton (81.4%), Billerica/Chelmsford/Tewksbury (81.5%)
 - Waltham/Arlington/Watertown (81.2%), Norwood/Walpole/Sharon (82.4%), Wakefield/Reading/Burlington (83.1%), Milford/Ashland/Holliston (83.2%), Franklin/Foxborough/Bellingham (83.2%),
 - Newton/Brookline (82.7%), Needham/Wellesley/Dedham (84.3%), Acton/Concord/Sudbury (85.2%)

2011 Other Towns/Cities Demographics - Race and Ethnicity – Page 1 of 2



			Householder Race and Ethnicity Profile ¹				
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	White	African American	Hispanic	Asian American	Am Indian/ Alaska Ntv
--	All Massachusetts ²	75.9%	81.7%	5.7%	7.5%	4.5%	0.1%
200	Franklin Cty*/Berkshire Cty*/ Worcester Cty*/Greenfield/Athol	74.9%	96.9%	0.6%	1.4%	0.9%	0.2%
4700	Barnstable Cty*/ Falmouth/Bourne/Dukes	75.9%	95.4%	1.8%	1.1%	0.6%	1.1%
3700	Norfolk Cty*/Braintree/Randolph/ Stoughton/Canton/Holbrook	76.3%	77.7%	13.9%	2.3%	5.2%	0.9%
2000	Hampden Cty*/Hampshire Cty*/ Ludlow/Longmeadow/Wilbraham	76.3%	96.3%	0.7%	1.6%	1.4%	0.0%
1600	Hampshire Cty*/Amherst/ Northampton/South Hadley	77.3%	89.0%	2.2%	4.7%	3.9%	0.2%
2100	Worcester Cty*/Southbridge/ Webster/Oxford/Northbridge	77.5%	93.5%	0.6%	5.0%	0.7%	0.3%
900	Essex Cty*/Gloucester/ Newburyport/Amesbury/Ipswich	78.5%	97.1%	1.0%	1.4%	0.5%	0.0%
1500	Worcester Cty*/Westborough/ Northborough/Clinton/Spencer	78.9%	92.9%	0.7%	2.7%	3.5%	0.2%
2500	Middlesex Cty*/Framingham/ Natick	79.1%	79.8%	5.1%	8.3%	5.5%	1.2%
4600	Plymouth/Marshfield/Wareham/ Pembroke/Duxbury/Kingston	79.3%	96.0%	1.6%	0.9%	0.4%	1.1%
2800	Middlesex Cty*/Woburn/Melrose/ Stoneham/Winchester	79.4%	89.9%	2.1%	2.5%	5.3%	0.3%
3900	Plymouth Cty*/Norfolk Cty*/ Weymouth/Hingham/Scituate	79.8%	95.3%	1.6%	1.1%	1.6%	0.4%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Only part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Race and Ethnicity – Page 2 of 2



			Householder Race and Ethnicity Profile ¹				
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	White	African American	Hispanic	Asian American	Am Indian/ Alaska Ntv
--	All Massachusetts ²	75.9%	81.7%	5.7%	7.5%	4.5%	0.1%
400	Middlesex Cty*/Marlborough/ Worcester Cty*/Hudson	79.9%	91.0%	2.1%	3.2%	3.3%	0.5%
2200	Worcester Cty*/Shrewsbury/ Auburn/Holden/Grafton/Millbury	80.7%	91.7%	1.1%	1.6%	5.4%	0.3%
2700	Middlesex Cty*/ Waltham/ Arlington/Watertown/Lexington	81.2%	83.4%	2.6%	3.8%	9.4%	0.8%
4100	Plymouth Cty*/Bristol/Bridge- water/Easton/Middleborough	81.4%	95.4%	1.8%	1.8%	0.7%	0.2%
500	Middlesex Cty*/Billerica/Chelms- ford/Tewksbury/Dracut/Westford	81.5%	92.1%	1.0%	1.9%	4.3%	0.6%
3500	Norfolk Cty*/Norwood/Walpole/ Sharon/Westwood/Medfield	82.4%	90.4%	2.8%	2.2%	3.8%	0.8%
3400	Newton/Brookline	82.7%	82.3%	1.6%	3.5%	12.2%	0.3%
1300	Middlesex Cty*/Wakefield/ Reading/Burlington/Wilmington	83.1%	90.7%	1.4%	2.1%	5.7%	0.1%
2400	Middlesex Cty*/Worcester Cty*/ Milford/Norfolk Cty*/Ashland	83.2%	90.1%	0.9%	3.7%	4.6%	0.7%
3600	Norfolk Cty*/Franklin/Worcester Cty*/Foxborough/Bellingham	83.2%	94.8%	1.1%	1.3%	2.6%	0.2%
2600	Norfolk Cty*/Needham/ Wellesley/Dedham/Weston	84.3%	89.5%	2.0%	2.5%	5.8%	0.1%
1400	Middlesex Cty*/Acton/Concord/ Sudbury/Wayland/Bedford	85.2%	89.3%	0.7%	2.1%	7.5%	0.3%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Household Income – Page 1 of 2



			Household Income ¹				
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	< \$25,000	\$25,000 - \$49,999	\$50,000 - \$74,999	\$75,000 - \$99,999	\$100,000+
--	All Massachusetts ²	75.9%	21.3%	19.6%	16.9%	12.8%	29.4%
200	Franklin Cty*/Berkshire Cty*/ Worcester Cty*/Greenfield/Athol	74.9%	21.8%	26.1%	19.5%	13.9%	18.8%
4700	Barnstable Cty*/ Falmouth/Bourne/Dukes	75.9%	21.5%	19.9%	18.4%	12.9%	27.3%
3700	Norfolk Cty*/Braintree/Randolph/ Stoughton/Canton/Holbrook	76.3%	17.5%	19.3%	16.2%	14.4%	32.6%
2000	Hampden Cty*/Hampshire Cty*/ Ludlow/Longmeadow/Wilbraham	76.3%	17.7%	21.4%	15.5%	14.0%	31.4%
1600	Hampshire Cty*/Amherst/ Northampton/South Hadley	77.3%	23.4%	22.4%	19.0%	13.4%	21.8%
2100	Worcester Cty*/Southbridge/ Webster/Oxford/Northbridge	77.5%	18.2%	19.6%	17.5%	14.0%	30.7%
900	Essex Cty*/Gloucester/ Newburyport/Amesbury/Ipswich	78.5%	17.5%	18.6%	17.4%	13.7%	32.8%
1500	Worcester Cty*/Westborough/ Northborough/Clinton/Spencer	78.9%	15.4%	20.0%	16.0%	14.2%	34.4%
2500	Middlesex Cty*/Framingham/ Natick	79.1%	17.0%	17.7%	15.6%	13.0%	36.6%
4600	Plymouth/Marshfield/Wareham/ Pembroke/Duxbury/Kingston	79.3%	15.8%	18.6%	15.3%	14.3%	36.0%
2800	Middlesex Cty*/Woburn/Melrose/ Stoneham/Winchester	79.4%	12.9%	17.0%	17.1%	15.5%	37.5%
3900	Plymouth Cty*/Norfolk Cty*/ Weymouth/Hingham/Scituate	79.8%	13.5%	19.7%	16.6%	12.8%	37.3%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Household Income – Page 2 of 2



			Household Income ¹				
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	< \$25,000	\$25,000 - \$49,999	\$50,000 - \$74,999	\$75,000 - \$99,999	\$100,000+
--	All Massachusetts ²	75.9%	21.3%	19.6%	16.9%	12.8%	29.4%
400	Middlesex Cty*/Marlborough/ Worcester Cty*/Hudson	79.9%	15.7%	18.0%	18.4%	11.7%	36.3%
2200	Worcester Cty*/Shrewsbury/ Auburn/Holden/Grafton/Millbury	80.7%	12.5%	18.1%	18.7%	15.1%	35.7%
2700	Middlesex Cty*/ Waltham/ Arlington/Watertown/Lexington	81.2%	15.4%	13.7%	16.1%	14.2%	40.6%
4100	Plymouth Cty*/Bristol/Bridge- water/Easton/Middleborough	81.4%	12.2%	15.8%	17.9%	18.2%	36.0%
500	Middlesex Cty*/Billerica/Chelms- ford/Tewksbury/Dracut/Westford	81.5%	13.1%	15.0%	15.8%	14.5%	41.6%
3500	Norfolk Cty*/Norwood/Walpole/ Sharon/Westwood/Medfield	82.4%	12.2%	12.8%	13.7%	13.4%	48.0%
3400	Newton/Brookline	82.7%	17.4%	11.4%	12.3%	9.3%	49.5%
1300	Middlesex Cty*/Wakefield/ Reading/Burlington/Wilmington	83.1%	9.9%	13.9%	15.9%	13.6%	46.7%
2400	Middlesex Cty*/Worcester Cty*/ Milford/Norfolk Cty*/Ashland	83.2%	13.0%	13.3%	14.9%	13.0%	45.9%
3600	Norfolk Cty*/Franklin/Worcester Cty*/Foxborough/Bellingham	83.2%	11.7%	16.2%	17.1%	14.4%	40.5%
2600	Norfolk Cty*/Needham/ Wellesley/Dedham/Weston	84.3%	9.9%	10.0%	13.7%	9.4%	57.0%
1400	Middlesex Cty*/Acton/Concord/ Sudbury/Wayland/Bedford	85.2%	10.0%	12.1%	11.6%	10.4%	55.9%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Educational Attainment – Page 1 of 2



			Householder Highest Education Level Attained ¹			
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	No High School Diploma	High School Diploma	Some College/ Assoc. Degree	Bachelors Degree+
--	All Massachusetts ²	75.9%	10.0%	23.9%	25.6%	40.5%
200	Franklin Cty*/Berkshire Cty*/ Worcester Cty*/Greenfield/Athol	74.9%	8.4%	29.7%	29.9%	31.9%
4700	Barnstable Cty*/ Falmouth/Bourne/Dukes	75.9%	4.5%	18.7%	29.4%	47.5%
3700	Norfolk Cty*/Braintree/Randolph/ Stoughton/Canton/Holbrook	76.3%	7.0%	28.4%	30.5%	34.0%
2000	Hampden Cty*/Hampshire Cty*/ Ludlow/Longmeadow/Wilbraham	76.3%	8.4%	26.7%	28.5%	36.4%
1600	Hampshire Cty*/Amherst/ Northampton/South Hadley	77.3%	5.8%	18.4%	25.6%	50.1%
2100	Worcester Cty*/Southbridge/ Webster/Oxford/Northbridge	77.5%	10.1%	31.2%	28.3%	30.5%
900	Essex Cty*/Gloucester/ Newburyport/Amesbury/Ipswich	78.5%	5.9%	22.2%	27.9%	44.0%
1500	Worcester Cty*/Westborough/ Northborough/Clinton/Spencer	78.9%	9.7%	21.6%	26.6%	42.1%
2500	Middlesex Cty*/Framingham/ Natick	79.1%	6.5%	18.7%	20.2%	54.6%
4600	Plymouth/Marshfield/Wareham/ Pembroke/Duxbury/Kingston	79.3%	4.5%	27.7%	30.0%	37.8%
2800	Middlesex Cty*/Woburn/Melrose/ Stoneham/Winchester	79.4%	5.3%	23.2%	24.3%	47.2%
3900	Plymouth Cty*/Norfolk Cty*/ Weymouth/Hingham/Scituate	79.8%	4.1%	23.8%	27.7%	44.5%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Educational Attainment – Page 2 of 2



			Householder Highest Education Level Attained ¹				
Census PUMA Code/Area	Primary Towns/Cities in PUMA	Broadband Adoption ¹	No High School Diploma	High School Diploma	Some College/Assoc. Degree	Bachelors Degree+	
--	All Massachusetts ²	75.9%	10.0%	23.9%	25.6%	40.5%	
400	Middlesex Cty*/Marlborough/Worcester Cty*/Hudson	Marlborough/Hudson	79.9%	7.0%	26.1%	24.5%	42.4%
2200	Worcester Cty*/Shrewsbury/Auburn/Holden/Grafton/Millbury	Shrewsbury/Auburn/Holden	80.7%	6.5%	22.7%	25.2%	45.6%
2700	Middlesex Cty*/ Waltham/Arlington/Watertown/Lexington	Waltham/Arlington/Watertown	81.2%	5.6%	16.8%	16.8%	60.8%
4100	Plymouth Cty*/Bristol/Bridgewater/Easton/Middleborough	Bristol/Bridgewater/Easton	81.4%	5.2%	28.4%	30.7%	35.7%
500	Middlesex Cty*/Billerica/Chelmsford/Tewksbury/Dracut/Westford	Billerica/Chelmsford/Tewksbury	81.5%	4.6%	25.8%	27.3%	42.2%
3500	Norfolk Cty*/Norwood/Walpole/Sharon/Westwood/Medfield	Norwood/Walpole/Sharon	82.4%	3.3%	15.9%	23.6%	57.2%
3400	Newton/Brookline	Newton/Brookline	82.7%	3.3%	7.5%	11.4%	77.8%
1300	Middlesex Cty*/Wakefield/Reading/Burlington/Wilmington	Wakefield/Reading/Burlington	83.1%	3.7%	21.3%	26.2%	48.8%
2400	Middlesex Cty*/Worcester Cty*/Milford/Norfolk Cty*/Ashland	Milford/Ashland/Holliston	83.2%	3.8%	19.1%	22.5%	54.5%
3600	Norfolk Cty*/Franklin/Worcester Cty*/Foxborough/Bellingham	Franklin/Foxborough/Bellingham	83.2%	5.1%	22.3%	28.9%	43.7%
2600	Norfolk Cty*/Needham/Wellesley/Dedham/Weston	Needham/Wellesley/Dedham	84.3%	2.3%	9.7%	15.6%	72.4%
1400	Middlesex Cty*/Acton/Concord/Sudbury/Wayland/Bedford	Acton/Concord/Sudbury	85.2%	2.9%	10.1%	15.0%	72.0%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Age – Page 1 of 2



			Householder Age (years) ¹					
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	18-24	25-44	45-64	65-84	85+	
--	All Massachusetts ²	--	75.9%	3.3%	33.1%	41.2%	18.9%	3.5%
200	Franklin Cty*/Berkshire Cty*/ Worcester Cty*/Greenfield/Athol	Greenfield/Athol	74.9%	1.4%	26.6%	47.3%	21.4%	3.3%
4700	Barnstable Cty*/ Falmouth/Bourne/Dukes	Falmouth/Bourne/ Dukes	75.9%	1.1%	21.3%	42.9%	30.6%	4.0%
3700	Norfolk Cty*/Braintree/Randolph/ Stoughton/Canton/Holbrook	Braintree/Randolph/ Stoughton	76.3%	1.4%	32.4%	41.6%	20.4%	4.2%
2000	Hampden Cty*/Hampshire Cty*/ Ludlow/Longmeadow/Wilbraham	Ludlow/Long- meadow/Wilbraham	76.3%	1.6%	24.8%	46.4%	21.6%	5.6%
1600	Hampshire Cty*/Amherst/ Northampton/South Hadley	Amherst/North- ampton/S. Hadley	77.3%	7.9%	28.9%	41.3%	18.2%	3.7%
2100	Worcester Cty*/Southbridge/ Webster/Oxford/Northbridge	Southbridge/Webster /Oxford	77.5%	3.2%	33.4%	43.9%	16.8%	2.8%
900	Essex Cty*/Gloucester/ Newburyport/Amesbury/Ipswich	Gloucester/Newbury- port/Amesbury	78.5%	1.3%	26.1%	46.9%	22.0%	3.7%
1500	Worcester Cty*/Westborough/ Northborough/Clinton/Spencer	Westborough/North- borough/Clinton	78.9%	1.5%	31.0%	44.9%	18.8%	3.8%
2500	Middlesex Cty*/Framingham/ Natick	Framingham/Natick	79.1%	2.2%	34.1%	41.4%	19.1%	3.2%
4600	Plymouth/Marshfield/Wareham/ Pembroke/Duxbury/Kingston	Plymouth/Marshfield/ Wareham	79.3%	1.0%	28.5%	47.3%	19.4%	3.9%
2800	Middlesex Cty*/Woburn/Melrose/ Stoneham/Winchester	Woburn/Melrose/ Stoneham	79.4%	1.1%	32.1%	41.1%	20.4%	5.1%
3900	Plymouth Cty*/Norfolk Cty*/ Weymouth/Hingham/Scituate	Weymouth/Hingham/ Scituate	79.8%	1.2%	27.6%	45.0%	23.3%	2.9%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Age – Page 2 of 2



			Householder Age (years) ¹				
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	18-24	25-44	45-64	65-84	85+
--	All Massachusetts ²	75.9%	3.3%	33.1%	41.2%	18.9%	3.5%
400	Middlesex Cty*/Marlborough/ Worcester Cty*/Hudson	79.9%	1.3%	33.4%	46.0%	17.4%	1.9%
2200	Worcester Cty*/Shrewsbury/ Auburn/Holden/Grafton/Millbury	80.7%	1.4%	32.6%	42.9%	19.4%	3.7%
2700	Middlesex Cty*/ Waltham/ Arlington/Watertown/Lexington	81.2%	2.3%	35.5%	39.9%	19.0%	3.3%
4100	Plymouth Cty*/Bristol/Bridge- water/Easton/Middleborough	81.4%	1.2%	31.0%	46.4%	19.4%	2.0%
500	Middlesex Cty*/Billerica/Chelms- ford/Tewksbury/Dracut/Westford	81.5%	1.3%	30.1%	47.1%	18.4%	3.1%
3500	Norfolk Cty*/Norwood/Walpole/ Sharon/Westwood/Medfield	82.4%	0.5%	27.4%	45.9%	21.9%	4.4%
3400	Newton/Brookline	82.7%	4.4%	33.2%	38.5%	18.6%	5.2%
1300	Middlesex Cty*/Wakefield/ Reading/Burlington/Wilmington	83.1%	1.2%	31.2%	43.8%	20.6%	3.2%
2400	Middlesex Cty*/Worcester Cty*/ Milford/Norfolk Cty*/Ashland	83.2%	1.0%	32.4%	47.3%	16.4%	2.8%
3600	Norfolk Cty*/Franklin/Worcester Cty*/Foxborough/Bellingham	83.2%	1.6%	32.8%	47.3%	15.9%	2.4%
2600	Norfolk Cty*/Needham/ Wellesley/Dedham/Weston	84.3%	0.8%	25.8%	45.6%	21.6%	6.2%
1400	Middlesex Cty*/Acton/Concord/ Sudbury/Wayland/Bedford	85.2%	0.5%	26.6%	49.8%	19.8%	3.3%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Summary By Risk Factor – Page 1 of 2



			% of Householders With Highest Broadband Risk Factors ¹			
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	Afr American or Hispanic	Income < \$25,000	High School Degree or Less	Aged 65+
--	All Massachusetts²	75.9%	13.8%	21.3%	33.9%	22.4%
200	Franklin Cty*/Berkshire Cty*/ Worcester Cty*/Greenfield/Athol	74.9%	2.2%	21.8%	38.2%	24.7%
4700	Barnstable Cty*/ Falmouth/Bourne/Dukes	75.9%	4.0%	21.5%	23.2%	34.7%
3700	Norfolk Cty*/Braintree/Randolph/ Stoughton/Canton/Holbrook	76.3%	17.1%	17.5%	35.4%	24.6%
2000	Hampden Cty*/Hampshire Cty*/ Ludlow/Longmeadow/Wilbraham	76.3%	2.3%	17.7%	35.1%	27.2%
1600	Hampshire Cty*/Amherst/ Northampton/South Hadley	77.3%	7.1%	23.4%	24.3%	21.9%
2100	Worcester Cty*/Southbridge/ Webster/Oxford/Northbridge	77.5%	5.9%	18.2%	41.3%	19.6%
900	Essex Cty*/Gloucester/ Newburyport/Amesbury/Ipswich	78.5%	2.4%	17.5%	28.2%	25.7%
1500	Worcester Cty*/Westborough/ Northborough/Clinton/Spencer	78.9%	3.6%	15.4%	31.3%	22.6%
2500	Middlesex Cty*/Framingham/ Natick	79.1%	14.7%	17.0%	25.2%	22.3%
4600	Plymouth/Marshfield/Wareham/ Pembroke/Duxbury/Kingston	79.3%	3.6%	15.8%	32.2%	23.3%
2800	Middlesex Cty*/Woburn/Melrose/ Stoneham/Winchester	79.4%	4.8%	12.9%	28.5%	25.6%
3900	Plymouth Cty*/Norfolk Cty*/ Weymouth/Hingham/Scituate	79.8%	3.1%	13.5%	27.9%	26.2%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement

2011 Other Towns/Cities Demographics - Summary By Risk Factor – Page 2 of 2



			% of Householders With Highest Broadband Risk Factors ¹			
Census PUMA Code/Area	Primary Towns/ Cities in PUMA	Broadband Adoption ¹	Afr American or Hispanic	Income < \$25,000	High School Degree or Less	Aged 65+
--	All Massachusetts²	75.9%	13.8%	21.3%	33.9%	22.4%
400	Middlesex Cty*/Marlborough/ Worcester Cty*/Hudson	79.9%	5.7%	15.7%	33.1%	19.3%
2200	Worcester Cty*/Shrewsbury/ Auburn/Holden/Grafton/Millbury	80.7%	2.9%	12.5%	29.1%	23.2%
2700	Middlesex Cty*/ Waltham/ Arlington/Watertown/Lexington	81.2%	7.2%	15.4%	22.4%	22.3%
4100	Plymouth Cty*/Bristol/Bridge- water/Easton/Middleborough	81.4%	3.8%	12.2%	33.6%	21.4%
500	Middlesex Cty*/Billerica/Chelms- ford/Tewksbury/Dracut/Westford	81.5%	3.5%	13.1%	30.5%	21.6%
3500	Norfolk Cty*/Norwood/Walpole/ Sharon/Westwood/Medfield	82.4%	5.8%	12.2%	19.2%	26.3%
3400	Newton/Brookline	82.7%	5.4%	17.4%	10.8%	23.8%
1300	Middlesex Cty*/Wakefield/ Reading/Burlington/Wilmington	83.1%	3.6%	9.9%	25.0%	23.8%
2400	Middlesex Cty*/Worcester Cty*/ Milford/Norfolk Cty*/Ashland	83.2%	5.3%	13.0%	22.9%	19.2%
3600	Norfolk Cty*/Franklin/Worcester Cty*/Foxborough/Bellingham	83.2%	2.6%	11.7%	27.4%	18.3%
2600	Norfolk Cty*/Needham/ Wellesley/Dedham/Weston	84.3%	4.7%	9.9%	12.0%	27.8%
1400	Middlesex Cty*/Acton/Concord/ Sudbury/Wayland/Bedford	85.2%	3.2%	10.0%	13.0%	23.0%

¹ Determined and weighted at the Household level

² Determined using the ACS 2009-2011 Survey vs. the 2011 Internet and Computer Use Supplement, which indicated a rate of 76.5%

* Part of county included

SOURCES: US Census ACS 2009-2011 Survey; NTIA broadband regression analysis for the 2010 Internet and Computer Use Supplement



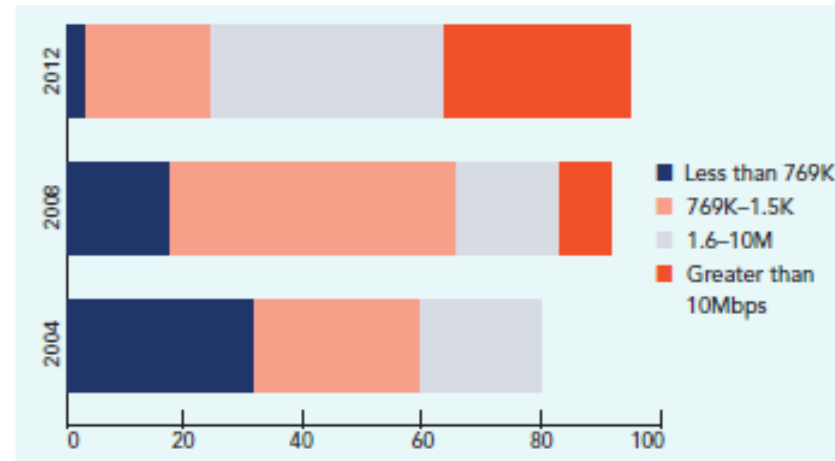
Library Trends



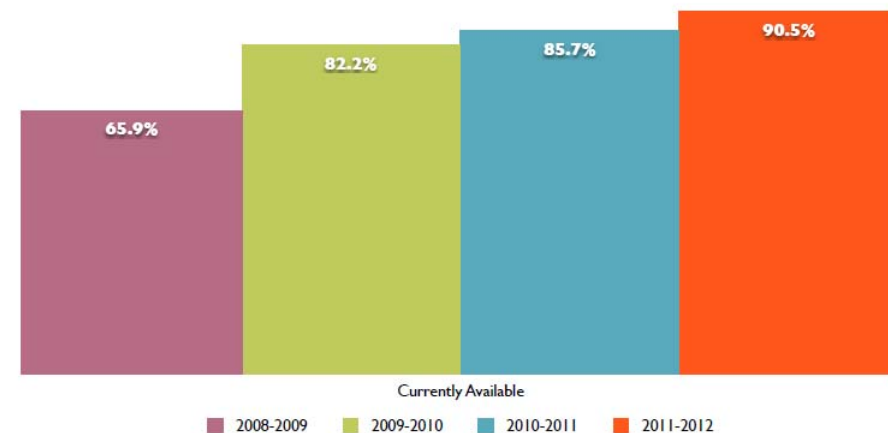
U.S. Library Broadband Speed and WiFi

- Libraries available with WiFi grew approximately 30% from 2009-2011 to 91% in 2012
- Use of eBooks, eReaders and accessing social networks are lead activities at libraries
- Bandwidth and speed since 2004 have increased dramatically, allowing for greater consumption of e-Enabled applications and content

Bandwidth Speeds at U.S. Public Libraries



U.S. Public Library Availability of WiFi



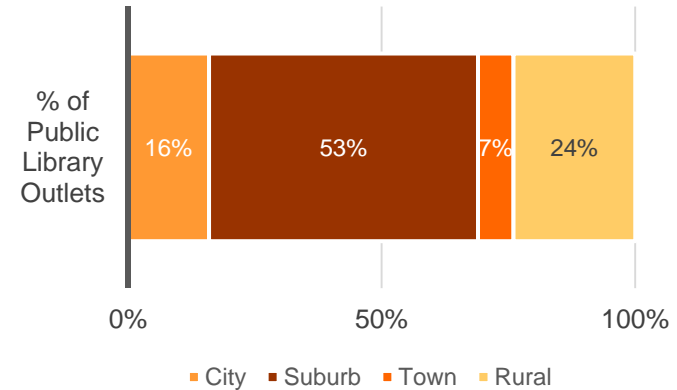
SOURCE: The Public Library Funding & Technology Access Survey by the Information Policy and Access Center at the University of Maryland May 2012



2011 Massachusetts Library Profile

- While there has been little if any growth in library visitations per capita from 2008-2011, growth in circulations has increased approximately 25%
- Massachusetts libraries increased page views 50.1% from 2008 to 2009 to 34.9 million
- 77% of MA public library outlets service largely suburban and rural communities

Public Library Outlets by Locality



Quick Stats

Massachusetts Libraries 2011	
Number of public libraries	359
Number of public outlets	453
Population served	6.5 mil
Number of librarians (full-time equiv)	1,694
Massachusetts MBLC Website Usage 2009	
Page views	34,900,000
Portal site visits	132,000

SOURCE: Massachusetts Library Service and Technology Act Evaluation (2008 – 2012), Prepared by Himmel & Wilson, Library Consultants 2012

2011 Massachusetts Libraries Profile continued



- Massachusetts is 15.1% greater than the US average for bandwidth speeds at 10.-30mbps and 6.4% greater than the US average for wireless availability at 96.9%
- Use of licensed databases, Audio content and eBooks have the greatest demand for MA library internet services

Selected Library Internet Connectivity and Usage Statistics (2011)

	MA	US
Connectivity (Library Outlet/Branch Data)		
Offers only free access to computers/internet	58.0%	62.1%
Average number of computers per library	12.9	16.4
Always sufficient computers available	48.9%	60.2%
Maximum internet connection speed:		
> Up to 1.5 mbps	10.7%	23.4%
> 1.6 – 10 mbps	25.8%	38.5%
> 10.1 – 30 mbps	30.9%	15.8%
> Greater than 30 mbps	16.3%	22.3%
Average adequate connection speed	68.7%	58.3%
Wireless availability	96.9%	90.5%
Internet Services (Library Outlet/Branch Data)		
Licensed databases	96.6%	98.7%
Homework resources	78.9%	81.8%
Digital/virtual reference	55.9%	69.7%
eBooks	88.1%	76.3%
Audio Content	89.6%	82.9%
Library social networking	57.5%	61.8%
Offers IT Training to patrons	87.7%	82.7%
Provides jobs databases and resources	83.5%	92.2%

SOURCE: American Libraries Tech Access Study 2011



Appendix

PUMA Code Definitions



Appendix | PUMA Code Definitions

In our analysis, we identified the major geographic areas within a particular PUMA code. To supplement this analysis, particularly for smaller geographic areas, we have provided in this section a list of all Massachusetts counties, cities, towns, and Census Designated Places (CDPs)* identified by the Census and the PUMA within which they are included.

Note that PUMA codes represent geographic areas of at least 100,000 residents or more within a given state.

- Larger geographic areas – e.g. Boston and such counties as Suffolk and Worcester – typically are split among multiple PUMAs
- For smaller geographic areas, the Census Bureau combines multiple ones with similar demographic attributes until they exceed this 100,000 resident threshold. As a result, the broadband adoption rate for a specific town, city, or other area may vary from the overall rate of the PUMA in which it's included

** A Census Designated Place (CDP) is the statistical counterpart of incorporated places and are delineated to provide data for settled concentrations of population that are identifiable by name but are not legally incorporated under the laws of the state in which they are located. CDPs are delineated cooperatively by state and local officials and the Census Bureau, following Census Bureau guidelines. SOURCE: US Census: American FactFinder*



Appendix | PUMA Code Definitions

Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code
Abington town and CDP	4000	Auburn town	2200	Bliss Corner CDP	4500
Acton town	1400	Avon town	4000	Bolton town	400
Acushnet Center CDP	4500	Ayer town and CDP	400	Bondsville CDP	2000
Acushnet town	4500	Baldwinville CDP	300	Boston city	3301-3305
Adams town and CDP	100	Barnstable County	4700-4800	Bourne town and CDP	4700
Agawam city	1800	Barnstable Town city	4800	Boxborough town	1400
Alford town	200	Barre town and CDP	1500	Boxford town and CDP	800
Amesbury town & CDP	900	Becket town	200	Boylston town	1500
Amherst Center CDP	1600	Bedford town	1400	Braintree town and CDP	3700
Amherst town	1600	Belchertown town, CDP	2000	Brewster town and CDP	4800
Andover CDP	700	Bellingham town, CDP	3600	Bridgewater town, CDP	4100
Andover town	700	Belmont town and CDP	2700	Brimfield town	1500
Aquinnah town	4700	Berkley town	4200	Bristol County	4100-4500
Arlington town and CDP	2700	Berkshire County	100, 200	Brockton city	4000
Ashburnham town	300	Berlin town	400	Brookfield town	1500
Ashby town	300	Bernardston town	200	Brookline town and CDP	3400
Ashfield town	200	Beverly city	1100	Buckland town	200
Ashland town	2400	Billerica town	500	Burlington town, CDP	1300
Athol town and CDP	200	Blackstone town	3600	Buzzards Bay CDP	4700
Attleboro city	4300	Blandford town	200	Cambridge city	3200

SOURCE: 2000 US Census

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Appendix | PUMA Code Definitions continued

Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code
Canton town	3700	Conway town	200	East Dennis CDP	4800
Carlisle town	1400	Cordaville CDP	2400	East Douglas CDP	2100
Carver town	4600	Cummington town	200	East Falmouth CDP	4700
Charlemont town	200	Dalton town	100	East Harwich CDP	4800
Charlton town	2100	Danvers town and CDP	1000	East Longmeadow town	2000
Chatham town and CDP	4700	Dartmouth town	4500	East Pepperell CDP	500
Chelmsford town	500	Dedham town and CDP	2600	East Sandwich CDP	4800
Chelsea city	2900	Deerfield town	200	Eastham town	4700
Cheshire town	100	Dennis Port CDP	4800	Easthampton city	1700
Chester town	200	Dennis town and CDP	4800	Easton town	4100
Chesterfield town	200	Dighton town	4200	Edgartown town	4700
Chicopee city	1700	Douglas town	2100	Egremont town	200
Chilmark town	4700	Dover town and CDP	2600	Erving town	200
Clarksburg town	100	Dracut town	500	Essex County	700-1200
Clinton CDP	1500	Dudley town	2100	Essex town and CDP	900
Clinton town	1500	Dukes County	4700	Everett city	3100
Cochituate CDP (part)	1400	Dunstable town	500	Fairhaven town	4500
Cohasset town	3900	Duxbury town and CDP	4600	Fall River city	4400
Colrain town	200	East Bridgewater town	4100	Falmouth town and CDP	4700
Concord town	1400	East Brookfield town,CDP	1500	Fiskdale CDP	2100

SOURCE: 2000 US Census

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Appendix | PUMA Code Definitions continued

Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code
Fitchburg city	300	Greenfield town and CDP	200	Haverhill city	800
Florida town	200	Groton town and CDP	500	Hawley town	200
Forestdale CDP	4800	Groveland town	800	Heath town	200
Fort Devens CDP	400	Hadley town	1600	Hingham town and CDP	3900
Foxborough town, CDP	3600	Halifax town	4100	Hinsdale town	100
Framingham town, CDP	2500	Hamilton town	1000	Holbrook town and CDP	3700
Franklin city	3600	Hampden County	200,1500, 1700-2100	Holden town	2200
Franklin County	200, 1600	Hampden town	2000	Holland town and CDP	2100
Freetown town	4500	Hampshire County	200,1600-1800, 2000	Holliston town	2400
Gardner city	300	Hancock town	100	Holyoke city	1700
Georgetown town	800	Hanover town	3900	Hopedale town and CDP	3600
Gill town	200	Hanson town and CDP	4100	Hopkinton town and CDP	2400
Gloucester city	900	Hardwick town	200	Housatonic CDP	100
Goshen town	200	Harvard town	400	Hubbardston town	200
Gosnold town	4700	Harwich Center CDP	4800	Hudson town and CDP	400
Grafton town	2200	Harwich Port CDP	4800	Hull town and CDP	3900
Granby town and CDP	1600	Harwich town	4800	Huntington town	1800
Granville town	200	Hatfield town and CDP	1600	Ipswich town and CDP	900
Great Barrington town, CDP	100			Kingston town and CDP	4600
Green Harbor-Cedar Crest CDP	4600			Lakeville town	4100

SOURCE: 2000 US Census

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Appendix | PUMA Code Definitions continued

Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code
Lancaster town	400	Manchester-by-the-Sea town	1100	Methuen city	700
Lanesborough town	100	Mansfield Center CDP	4200	Middleborough Center CDP	4100
Lawrence city	700	Mansfield town	4200	Middleborough town	4100
Lee town and CDP	100	Marblehead town and CDP	1100	Middlefield town	200
Leicester town	2200	Marion Center CDP	4500	Middlesex County	300-600,1300-1400,2400-2800,3000-3200,3400
Lenox town and CDP	100	Marion town	4500	Middleton town	1000
Leominster city	300	Marlborough city	400	Milford town and CDP	2400
Leverett town	200	Marshfield Hills CDP	4600	Millbury town	2200
Lexington town and CDP	2700	Marshfield town and CDP	4600	Millers Falls CDP	200
Leyden town	200	Mashpee Neck CDP	4800	Millis town	2400
Lincoln town	2600	Mashpee town	4800	Millis-Clicquot CDP	2400
Littleton Common CDP	1400	Mattapoisett Center CDP	4500	Millville town	3600
Littleton town	1400	Mattapoisett town	4500	Milton town and CDP	3800
Longmeadow town and CDP	2000	Maynard town	1400	Monomoscoy Island CDP	4800
Lowell city	600	Medfield town and CDP	3500	Monroe town	200
Ludlow town	2000	Medford city	3000	Monson Center CDP	2000
Lunenburg town and CDP	300	Medway town	2400	Monson town	2000
Lynn city	1200	Melrose city	2800	Montague town	200
Lynnfield town and CDP	1000	Mendon town	3600	Monterey town	200
Malden city	3000	Merrimac town	800		

SOURCE: 2000 US Census

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Appendix | PUMA Code Definitions continued

Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code
Montgomery town	1800	North Adams city	100	Norton Center CDP	4200
Monument Beach CDP	4700	North Amherst CDP	1600	Norton town	4200
Mount Washington town	200	North Andover town	800	Norwell town	3900
Nahant town and CDP	1200	North Attleborough Center CDP	4300	Norwood town and CDP	3500
Nantucket County	4700	North Attleborough town	4300	Oak Bluffs town	4700
Nantucket town and CDP	4700	North Brookfield town and CDP	1500	Oakham town	1500
Natick town	2500	North Eastham CDP	4700	Ocean Bluff-Brant Rock CDP	4600
Needham town and CDP	2600	North Falmouth CDP	4700	Ocean Grove CDP	4300
New Ashford town	100	North Lakeville CDP	4100	Onset CDP	4600
New Bedford city	4500	North Pembroke CDP	4600	Orange town and CDP	200
New Braintree town	200	North Plymouth CDP	4600	Orleans town and CDP	4700
New Marlborough town	200	North Reading town	1300	Otis town	200
New Salem town	200	North Scituate CDP	3900	Oxford town and CDP	2100
New Seabury CDP	4800	North Seekonk CDP	4300	Palmer town and CDP	2000
Newbury town	900	North Westport CDP	4400	Paxton town	2200
Newburyport city	900	Northampton city	1600	Peabody city	1000
Newton city	3400	Northborough town and CDP	1500	Pelham town	200
Norfolk County	2400,2600, 3400-4000	Northbridge town	2100	Pembroke town	4600
Norfolk town	3500	Northfield town and CDP	200	Pepperell town and CDP	500
		Northwest Harwich CDP	4800	Peru town	200

SOURCE: 2000 US Census

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Appendix | PUMA Code Definitions continued

Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code
Petersham town	200	Rehoboth town	4300	Seconsett Island CDP	4800
Phillipston town	200	Revere city	2900	Seekonk town	4300
Pinehurst CDP	500	Richmond town	100	Sharon town and CDP	3500
Pittsfield city	100	Rochester town	4500	Sheffield town	200
Plainfield town	200	Rockland town	3900	Shelburne Falls CDP	200
Plainville town	3600	Rockport town and CDP	900	Shelburne town	200
Plymouth County (part)	3900-4100, 4500-4600	Rowe town	200	Sherborn town	2500
Plymouth town and CDP	4600	Rowley town and CPD	900	Shirley town and CDP	400
Plympton town	4100	Royalston town	200	Shrewsbury town	2200
Pocasset CDP	4700	Russell town	1800	Shutesbury town	200
Popponesset CDP	4800	Rutland town and CDP	1500	Smith Mills CDP	4500
Popponesset Island CDP	4800	Sagamore CDP	4700	Somerset town and CDP	4400
Princeton town	1500	Salem city	1100	Somerville city	3100
Provincetown town and CDP	4700	Salisbury town and CDP	900	South Amherst CDP	1600
Quincy city	3800	Sandisfield town	200	South Ashburnham CDP	300
Randolph town and CDP	3700	Sandwich town and CDP	4800	South Deerfield CDP	200
Raynham Center CDP	4100	Saugus town and CDP	1200	South Dennis CDP	4800
Raynham town	4100	Savoy town	200	South Duxbury CDP	4600
Reading town and CDP	1300	Scituate town and CDP	3900	South Hadley town	1600
		Seabrook CDP	4800	South Lancaster CDP	400

SOURCE: 2000 US Census

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Appendix | PUMA Code Definitions continued

Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code
South Yarmouth CDP	4800	Teaticket CDP	4700	Ware town and CDP	2000
Southampton town	1800	Templeton town	300	Wareham Center CDP	4600
Southborough town	2400	Tewksbury town	500	Wareham town	4600
Southbridge town and CDP	2100	Three Rivers CDP	2000	Warren town and CDP	1500
Southwick town	1800	Tisbury town	4700	Warwick town	200
Spencer town and CDP	1500	Tolland town	200	Washington town	200
Springfield city	1900	Topsfield town and CDP	1000	Watertown city	2700
Sterling town	1500	Townsend town and CDP	400	Wayland town	1400
Stockbridge town	100	Truro town	4700	Webster town and CDP	2100
Stoneham town and CDP	2800	Turners Falls CDP	200	Wellesley town and CDP	2600
Stoughton town	3700	Tyngsborough town	500	Wellfleet town	4700
Stow town	400	Tyringham town	200	Wendell town	200
Sturbridge town and CDP	2100	Upton town	2400	Wenham town	1000
Sudbury town	1400	Upton-West Upton CDP	2400	West Boylston town	2200
Suffolk County	2900,3301-3305	Uxbridge town	2100	West Bridgewater town	4100
Sunderland town	1600	Vineyard Haven CDP	4700	West Brookfield town and CDP	1500
Sutton town	2100	Wakefield town	1300	West Chatham CDP	4700
Swampscott town and CDP	1100	Wales town	2100	West Concord CDP	1400
Swansea town	4300	Walpole town and CDP	3500	West Dennis CDP	4800
Taunton city	4200	Waltham city	2700	West Falmouth CDP	4700

SOURCE: 2000 US Census

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Appendix | PUMA Code Definitions continued

Massachusetts Geographic Area	PUMA Code	Massachusetts Geographic Area	PUMA Code
West Newbury town	800	Wilbraham town and CDP	2000
West Springfield town and CDP	1800	Williamsburg town	1600
West Stockbridge town	100	Williamstown town and CDP	100
West Tisbury town	4700	Wilmington town	1300
West Wareham CDP	4600	Winchendon town and CDP	300
West Yarmouth CDP	4800	Winchester town and CDP	2800
Westborough town and CDP	1500	Windsor town	200
Westfield city	1800	Winthrop town and CDP	2900
Westford town	500	Woburn city	2800
Westhampton town	200	Woods Hole CDP	4700
Westminster town	300	Worcester city	2300
Weston town	2600	Worcester County	200-400,1500, 2100-2400,3600
Westport town	4400		
Westwood town	3500	Worthington town	200
Weweantic CDP	4600	Wrentham town	3600
Weymouth town and CDP	3900	Yarmouth Port CDP	4800
Whately town	200	Yarmouth town	4800
White Island Shores CDP	4600		
Whitinsville CDP	2100		
Whitman town	4100		

SOURCE: 2000 US Census

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Appendix

NTIA Regression Analysis



Appendix | NTIA Regression Analysis

Regression coefficients from the NTIA national broadband adoption study “Exploring the Digital Nation”, Table B4, November 2011. The regression is based on a sample of 54,269 and has an R Squared of 0.276 and confidence interval of 90%

Regression Factor	Weighting	Standard Error +/- **
Household Income:		
▪ Less than \$25,000	--	--
▪ \$25,000 - 49,999	0.1368	0.006
▪ \$50,000 – 74,999	0.2156	0.007
▪ \$75,000 – 99,999	0.2403	0.007
▪ \$100,000 or more	0.2460	0.007
Education:		
▪ No high school diploma	--	--
▪ High school diploma	0.1320	0.008
▪ Some college	0.2465	0.008
▪ College degree or more	0.3048	0.008
Age	0.0093	0.001
Age Squared	-0.0001	--
# Persons in household	0.0470	0.002
Has school-age children	0.1217	0.014
# in household/school-age children interaction	-0.0396	0.004

Regression Factor	Weighting	Standard Error +/- **
Race		
▪ White, non-Hispanic	--	--
▪ Black, non-Hispanic	-0.1099	0.007
▪ Hispanic	-0.1096	0.008
▪ Asian, non-Hispanic	-0.0052	0.010
▪ Other, non-Hispanic	-0.0529	0.014
Disability:		
▪ Disability	-0.0634	0.007
▪ Disability not identified	0.1065	0.020
Foreign-born non-citizen	-0.0473	0.010
Metro area:		
▪ Rural	--	--
▪ Urban	0.0528	0.006
▪ Metro area not identified	0.0617	0.023
Constant – U.S.	0.0641	0.026
Constant – Mass.	0.0898	0.022

** Represents standard error for a 90% confidence interval

SOURCE: “Exploring the Digital Nation, Computer and Internet Use at Home”, National Telecommunications and Information Administration (NTIA), November 2011



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