

**To:** Smart Chicago Collaborative  
**From:** Denise Linn, Harvard Kennedy School  
**Date:** April 2, 2015  
**Re:** Data Analysis on Chicago's Digital Divide

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**Summary: Major Take-Aways from the Data**

- ❖ When it comes to citywide broadband adoption averages, Chicago looks very similar to other MSAs. However, when you look at the distribution of adoption across Chicago tracts, Chicago has fewer high adoption areas than other cities (80-100% adoption).
- ❖ In Chicago, the presence of high household poverty in a census tract *strengthens* the negative effects that low educational attainment has on broadband adoption.
- ❖ In Chicago, tracts with higher percentages of households with children are predicted to fare worse when it comes to broadband adoption. The presence of high poverty strengthens that negative relationship.
- ❖ Access begets access. Tracts and neighborhoods more connected to city and community support are more connected to the Internet – even if they have high household poverty.

**Broadband Adoption in Chicago**

How does Chicago stack up compared to other cities?

	Average Broadband Adoption %	Source
All MSAs	71.2%	ACS (2013)
All MSAs (weighted by number of households)	75.2%	ACS (2013)
Chicago	75.9%	ACS (2013)
All MSA Census Tracts	40-60% (rating = 3.64)	FCC (2013)
Chicago's Census Tracts	40-60% (rating = 3.48)	FCC (2013)

<p>FCC FORM 477 BROADBAND SUBSCRIBERSHIP RATINGS</p> <p>5 = 80 – 100% adoption  4 = 60 – 80% adoption  3 = 40 – 60% adoption  2 = 20 – 40% adoption  1 = 0 – 20% adoption</p>
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On the surface, Chicago looks average. Based on the table above, Chicago is like similarly sized cities in the U.S. On the tract level, it also falls within the same broad rating category as other census tracts in cities.

If we dig down further beyond averages, we learn more about Chicago's digital divide. Chicago might have the similar average data, but there is good and bad news. The good news? Chicago has almost no census tracts in the 0-

20% rating. The bad news? Chicago has less census tracts in the 80-100% rating. You can see Chicago's different distribution of broadband adoption ratings if you compare **Table 1** and **Table 2**.

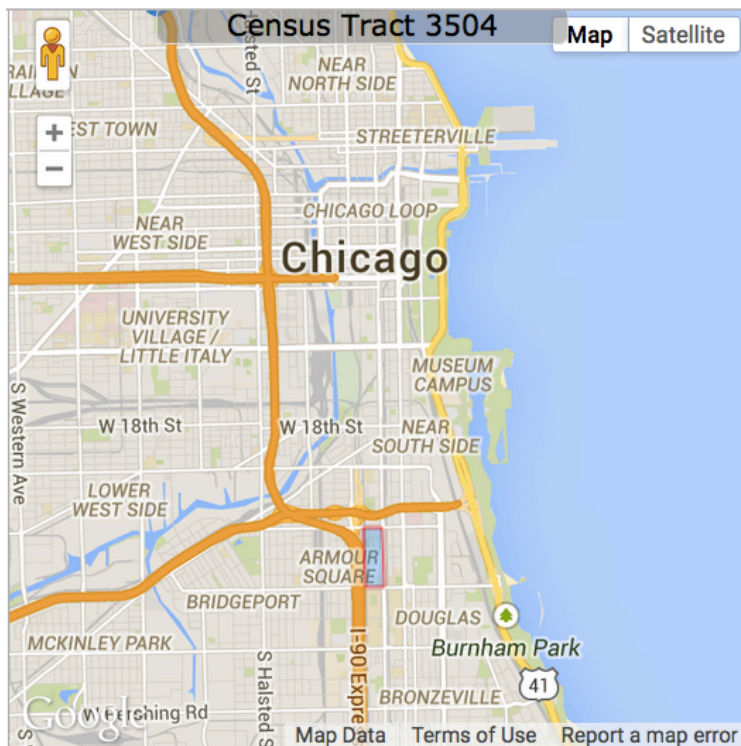
## Predictors of Broadband Adoption (or Non-Adoption) in Chicago

It's not surprising that *diversity, educational attainment, language, disability* and *age* are all predictors of broadband adoption. Based on the simple analysis run in **Table 5** and **Table 6**, we see all of those characteristics above in italics have strong associations with broadband adoption – even when we control for poverty and broadband competition. This implies what existing literature confirms – that the cost barrier is only part of the equation.

**Table 7** in the Appendix shows the dynamic way poverty *interacts* with other barriers to broadband adoption in Chicago. Educational attainment and age (in terms of percentage of households with under 18 year-olds) stand out in this analysis. There are large rating gaps between rich and poor tracts with the same percentages in those two categories. More striking is that fact that, when educational attainment decreases or the percentage of households with children increases, poor tracts' broadband adoption is predicted to drop more quickly.

## Learning from Outliers: Spotlight on Cook County Tract 3504

If we plot every occupied census tract in Chicago's Metropolitan Statistical Area (MSA), comparing percentage household poverty to broadband adoption rating (**See Table 8**), there are several tracts that appear to be over-performing.



One such over-performing outlier is Cook County Census Tract 3504. The tract is on a single northeastern block of Chicago's Douglas neighborhood. It has a modest 665 housing units, but 71.1% household poverty. The FCC has given this tract a "5" - meaning it has at least 80% at-home broadband adoption. What else is in this in or around this block? Drake Elementary School, Mount Carmel Missionary Baptist Church, and St. James Church. South of tract 3504 is the Illinois Institute of Technology.

Analyses in other cities have uncovered similar stories – that out-performing low-income tracts tend to be walkable, have proximity to amenities (transportation, parks,

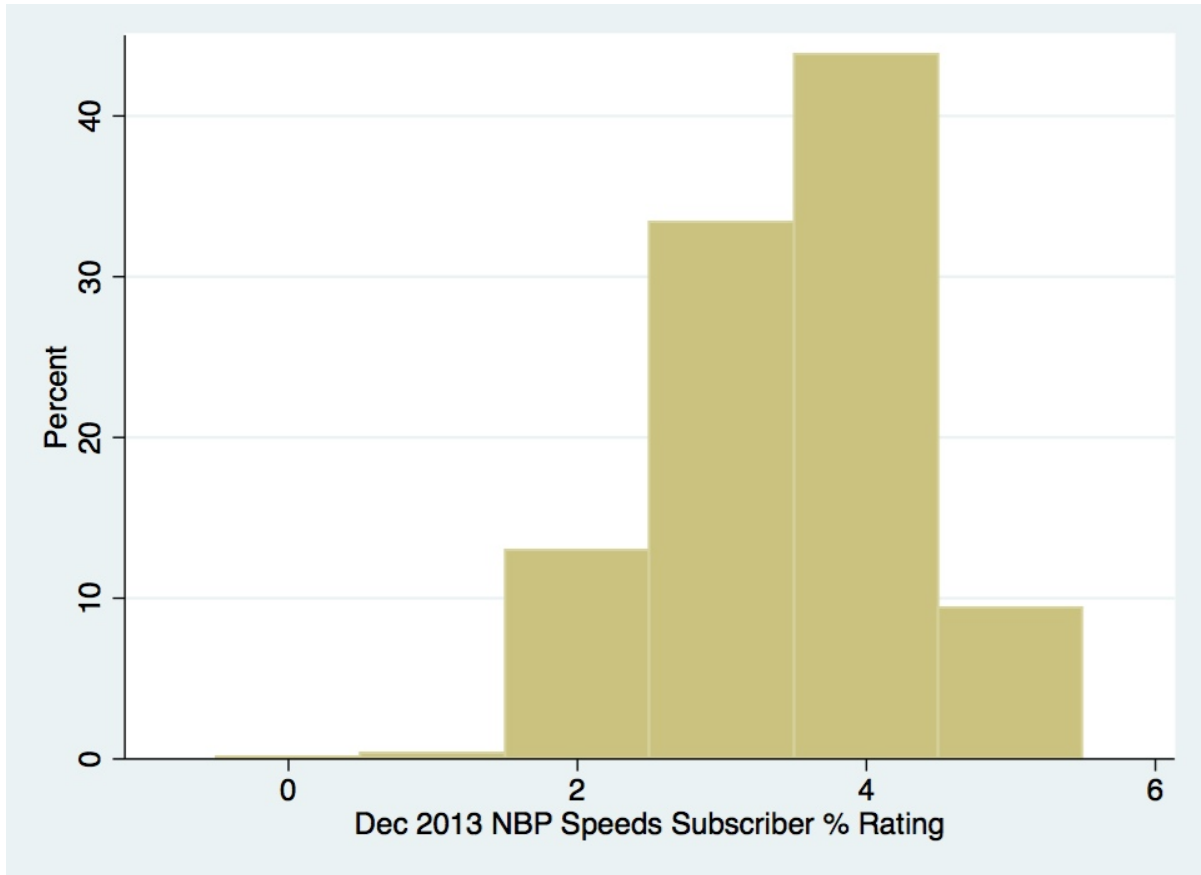
public Wi-Fi, etc.), community anchor institutions (schools, churches, community centers, etc.), and sometimes is the home to digital inclusion programming.

Is tract 3504 an anomaly due to size or circumstance? Local knowledge can supplement the data and shine light on whether there are lessons worth replicating in any of the “over-performing” low income tracts.

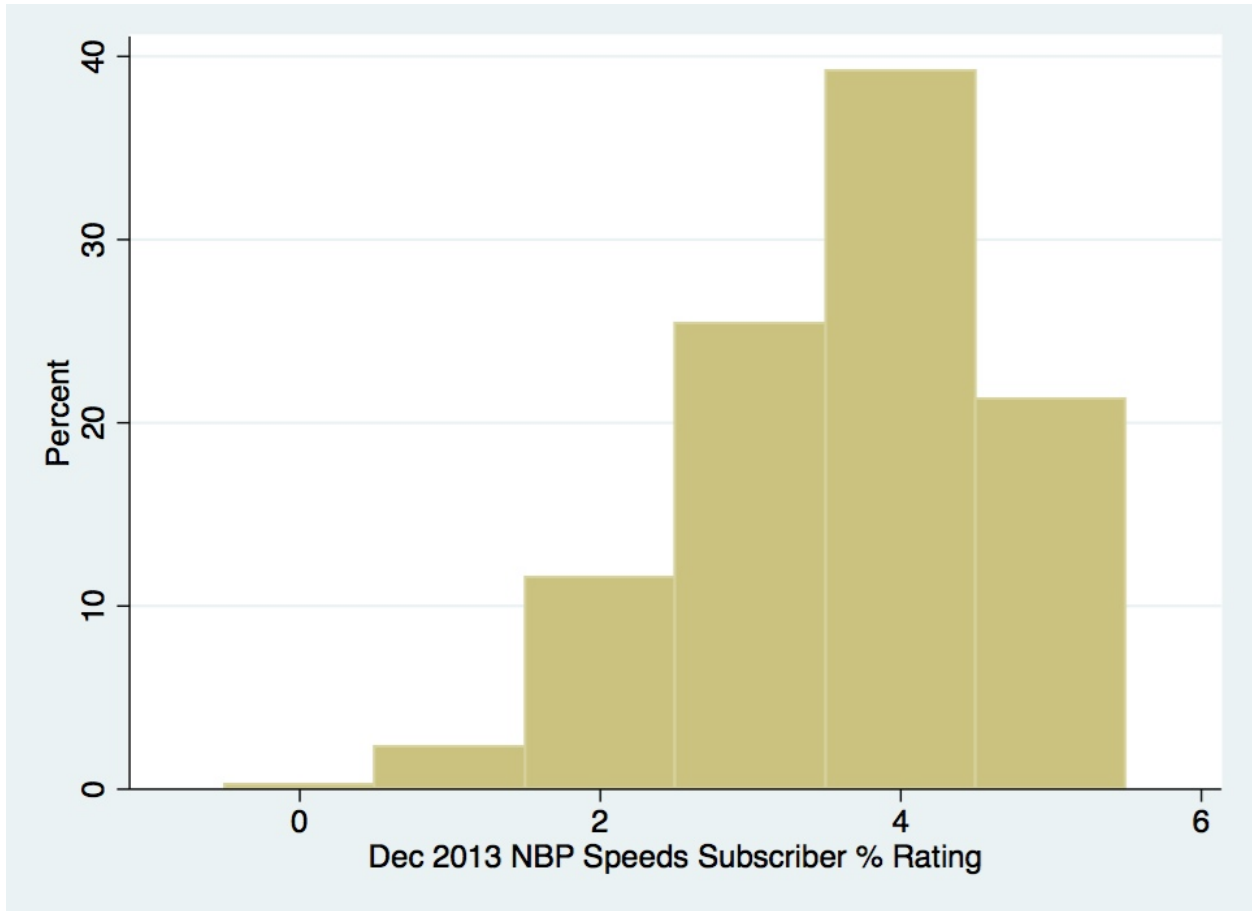
### ***About the Data***

This memo takes merged public data from the American Community Survey (ACS) and from the Federal Communications Commission (FCC) to unpack the digital divide in Chicago. These data were extracted from a larger data set on the urban digital divide, which, in partnership with Google Fiber, was used to compare digital inclusion challenges and advantages in gigabit cities and non-gigabit cities. As more public data are released, these analyses can be updated and enriched with change over time observations.

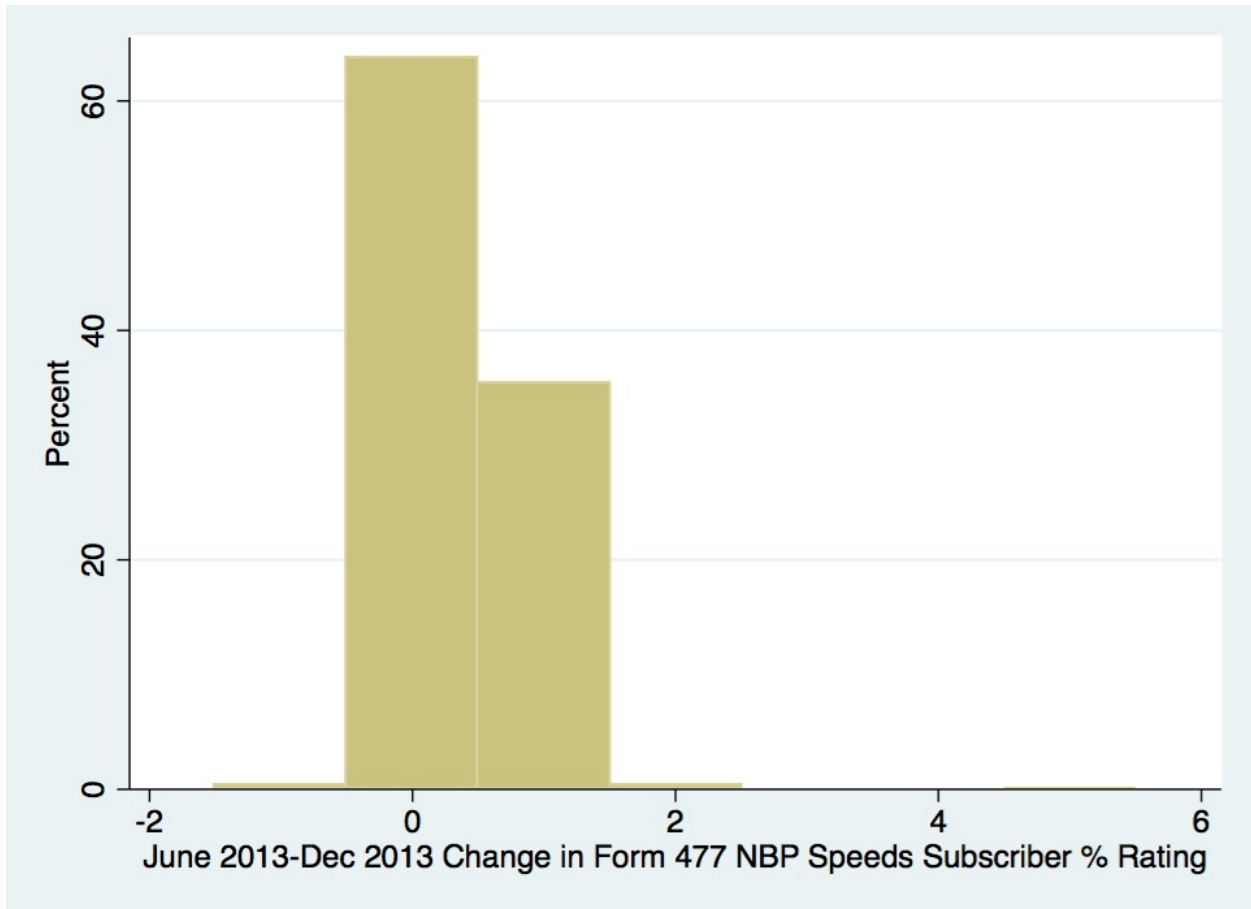
**Table 1: 2013 Distribution of FCC Broadband Adoption Ratings in Chicago's Census Tracts**



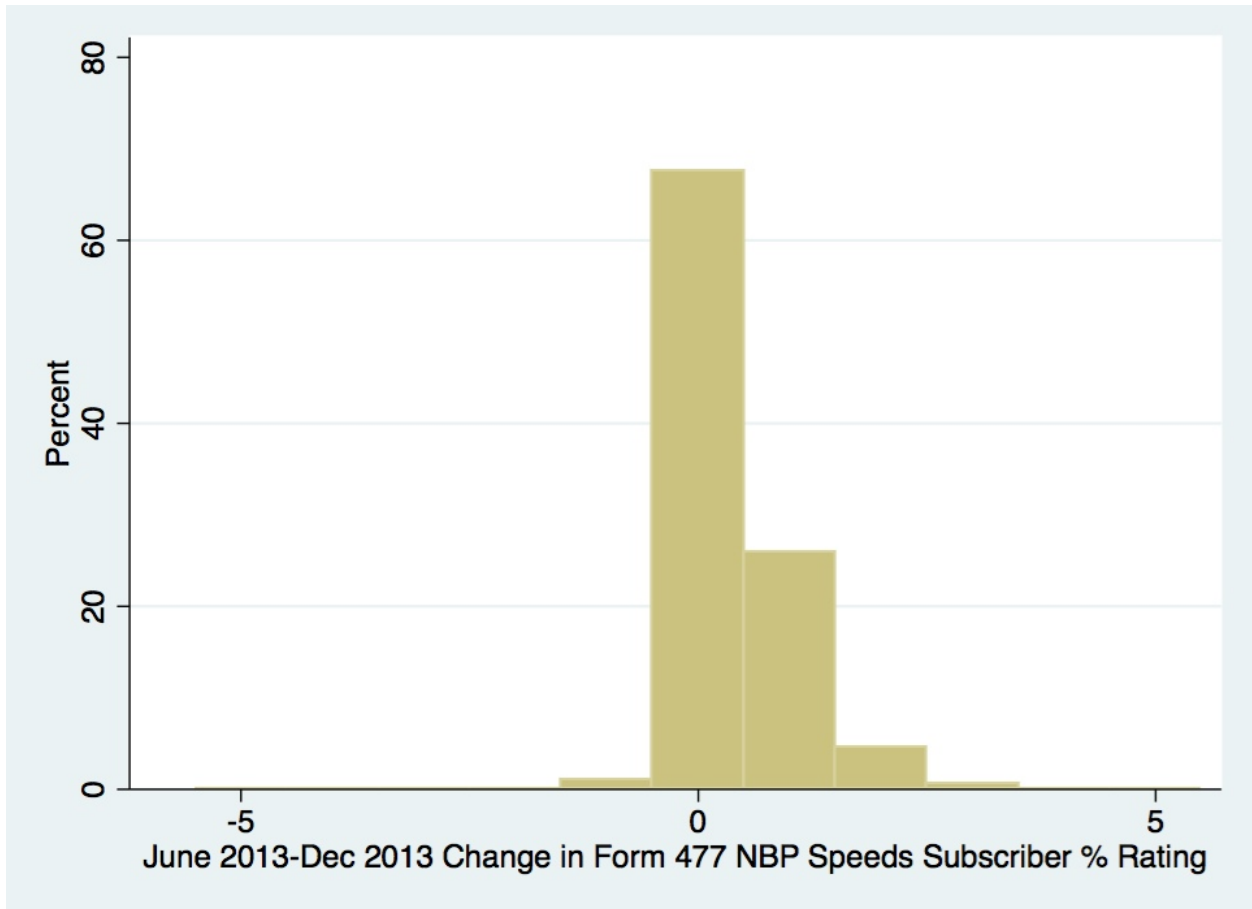
**Table 2: 2013 Distribution of FCC Broadband Adoption Ratings in All MSA Census Tracts**



**Table 3: Distribution of how Chicago's Census Tracts' Broadband Adoption Ratings Changed in 2013**



**Table 4: Distribution of How All MSA Census Tracts' Broadband Adoption Ratings Changed in 2013**



**Table 5: Predictors of Broadband Adoption in Chicago (2013)**

<b>Census Tract Characteristic</b>	<b>How is it Correlated with Broadband Adoption?</b>	<b>It the Characteristic's Effect on Adoption Statistically Significant?*</b>
<b>% Household Poverty</b>	Negative	Yes
<b>% White Alone</b>	Positive	Yes
<b>% High school degree or better</b>	Positive	Yes
<b>% Speaking non-English in the home</b>	Negative	Yes
<b>% Disability</b>	Negative	Yes
<b>% Households with an under 18-year-old</b>	Negative	Yes

\*at 5% level

**Table 6: Predictors of Broadband Adoption in Chicago (Controlling for Poverty and Competition) (2013)**

<b>Census Tract Characteristic (Controlling for % Household Poverty and # Providers)</b>	<b>How is it Correlated with Broadband Adoption?</b>	<b>It the Characteristic's Effect on Adoption Statistically Significant?*</b>
<b>% White Alone</b>	Positive	Yes
<b>% High school degree or better</b>	Positive	Yes
<b>% Speaking non-English in the home</b>	Negative	Yes
<b>% Disability</b>	Negative	Yes
<b>% Households with an under 18-year-old</b>	Negative	Yes

\*at 5% level



**Table 7: How Poverty Interacts with Other Predicted Barriers to Broadband Adoption in Chicago (2013)**

Hypothetical Chicago Tract	Predicted broadband adoption rating in rich Chicago tract (5% household poverty)	Predicted broadband adoption rating in average Chicago tract (15% household poverty)	Predicted broadband adoption rating in poorer Chicago tract (40% household poverty)	Is this characteristic's interaction with poverty statistically significant?
Average speaking non-English in the home (28%)	3.9	3.5	2.5	No
Above average speaking non-English in the home (50%)	3.8	3.4	2.4	No
Average households with someone 18 years old or younger (35%)	3.9	3.5	2.5	Yes
Above average households with someone 18 years old or younger (50%)	3.8	3.4	2.3	Yes
Average disability (10%)	3.8	3.5	2.5	Yes
Above average disability (25%)	3.0	2.7	2.2	Yes
Average white alone (62%)	3.8	3.4	2.6	Yes
Below average white (40%)	3.6	3.3	2.6	Yes
Average high school or better (85%)	3.7	3.4	2.7	Yes
Below average high school or better (60%)	3.8	3.4	2.4	Yes

**\*at 5% level**

Table 8: All Chicago Census Tracts – Broadband Adoption Rating vs. Poverty

